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ARTICLE

Right to Research and Copyright Law: From Photocopying to Shadow Libraries

M P Ram Mohan & Aditya Gupta

NOTE

The Food Microbiome as Traditional Knowledge

Jacob J. Golan

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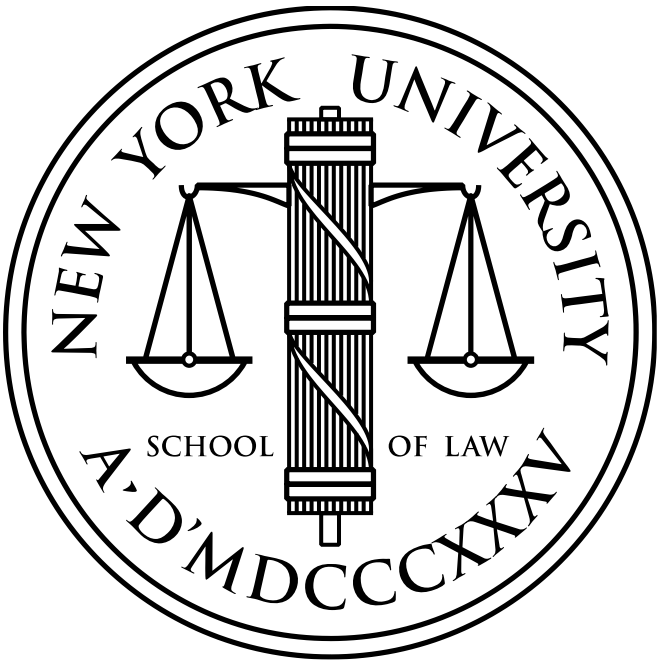

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Consistent with its unique development, the New York University Journal of Intellectual Property & Entertainment Law (JIPEL) is a nonpartisan periodical specializing in the analysis of timely and cutting-edge topics in the world of intellectual property and entertainment law. As NYU's first online-only journal, JIPEL also provides an opportunity for discourse through comments from all of its readers. There are no subscriptions or subscription fees; in keeping with the open-access and free discourse goals of the students responsible for JIPEL's existence, the content is available for free to anyone interested in intellectual property and entertainment law.

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The Journal is also available on WESTLAW, LEXIS-NEXIS and HeinOnline.

PREFACE

Our Spring 2022 Issue—Volume 11, Issue 3—considers intellectual property debates happening across the world.

We begin in India, where a pending copyright case threatens access to academic literature. Authors M P Ram Mohan and Aditya Gupta explain how copyright laws have allowed commercial publishers to amass huge profits by keeping academic articles guarded behind steep paywalls. Those who can't pay miss out on treasure troves of information, which in turn limits subsequent discoveries and innovations. In response, a wave of "academic pirates" have begun sharing articles freely online, but these organizations raise significant copyright concerns. Mohan and Gupta therefore consider whether copyright laws can (and should) protect the pirates.

Next, Jacob J. Golan combines wine and cheese with intellectual property. What's better than that? Specifically, Golan explores what legal protections are available for the microbial cultures used in fermented foods. From Kentucky Bourbon to Champagne, the need for legal protections impacts communities worldwide, but no clear path currently exists. In a search for answers, Golan highlights the difficulty in defining microbes and the corresponding difficulty in protecting them under traditional legal mechanisms. Still, he finds that trade secrets may provide a solution for communities across the globe.

The two pieces herein share an international scope but tackle very different topics. Taken together, they illustrate how vast the field of intellectual property has grown. I couldn't ask for a better way to end my tenure as Editor-in-Chief.

Thank you to those who worked on this, and thank you for reading.

Sincerely,

Taylor Peterson
Editor-in-Chief
NYU Journal of Intellectual Property & Entertainment Law

NEW YORK UNIVERSITY

JOURNAL OF INTELLECTUAL PROPERTY AND ENTERTAINMENT LAW

VOLUME 11 SPRING 2022 NUMBER 3

RIGHT TO RESEARCH AND COPYRIGHT LAW: FROM PHOTOCOPYING TO SHADOW LIBRARIES

M P RAM MOHAN* & ADITYA GUPTA**

Academic research and publishing are facing a crisis. The importance of access to academic literature in an interconnected world, the ever-growing cost of subscriptions to this literature, different revenue models of journals, and reduced or stagnant library budgets are pushing the academic community to find alternatives for research publications. In its 25 years of existence, the Open Access Movement and models which sought to contain the crisis have become the subject of considerable criticism. At the same time, a significant portion of academic literature remains locked behind steep paywalls. This has led to the growth of pirate websites and shadow libraries, which have been met with forceful legal retribution by publishers using copyright laws. Using the Sci-Hub case, a current copyright infringement case brought by a group of publishers before the Delhi High Court, this Paper evaluates the Open Access Movement, fair dealing in copyright law, academic piracy, and court cases in the United States, India, and other countries within the broad meaning of the right to research. The Paper concludes that a purposive interpretation of copyright law may have an answer enabling a just outcome.†

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INTRODUCTION

Close your eyes and imagine that your taxpayer money is being used to construct a road in your neighbourhood. The company overseeing the construction does not pay a salary to its workers; some workers even pay a fee for the privilege of working on the project. The project managers who ensure that the construction complies with the relevant regulatory criteria are not paid either. Furthermore, if you, as the taxpaying funder of this project, wish to walk on the road, you must buy access to it. Purchasing access is required for fragments of the road. The cost of accessing a significant portion of the road requires a subscription cost in the neighbourhood of

a million dollars. Brian Resnick and Julia Belluz, writing for *Vox*, posed this hypothetical to discuss the extremely profitable business of academic publishing.[1] Would you consider this a viable business model?

The commercial and for-profit academic publishing industry has leveraged uncompensated labour from researchers and academics[2] to create a business that generates over $25.7 billion in annual global revenues.[3] The hypothetical workers in Resnick and Belluz's comparison are experts who conduct research, prepare articles, and submit them for free to academic publishers. The overseers are the peer review board and editors of the journals, who often work without any monetary remuneration. In some cases, researchers pay "Article Processing Charges" for the publication of their research, which can be understood as analogous to the fees paid by the hypothetical workers. A substantial number of these academics and researchers work with universities and organisations that receive generous government grants—hence, the involvement of public money. Lastly, students, academics, and other researchers who want access to the published papers must buy subscriptions, despite their taxpayer money having subsidized the research.

Generally, scholarly publications, such as books, are *information goods* with high fixed and low variable costs.[4] Academic journals have managed to leverage the scholarly community to hedge the fixed costs of their business. The primary goods for their business (*i.e.*, scholarly research) and quality control (*i.e.*, peer review) are provided free of charge by the academic community.[5] A report from the U.K.'s House of Commons described that in academic publishing "public money is used at three stages in the publishing process: to fund the research project; to pay the salaries of academics who carry out peer review for no extra payment; and to fund libraries

[1] Brian Resnick and Julia Belluz, *The War to Free Science*, VOX (July 10, 2019, 3:58 PM), https://www.vox.com/the-highlight/2019/6/3/18271538/open-access-elsevier-california-sci-hub-academic-paywalls.

[2] *See generally* Jonathan P. Tennant, *Time to Stop the Exploitation of Free Academic Labour*, 46 EUR. SCI. EDITING 1, 1 (2020); JOHN WILLINSKY, THE ACCESS PRINCIPLE: THE CASE FOR OPEN ACCESS TO RESEARCH AND SCHOLARSHIP 49 (MIT Press 2006); Armin Beverungen, Steffen Böhm & Christopher Land, *The Poverty of Journal Publishing*, 19 ORG. 929, 932 (2012).

[3] ROB JOHNSON, ANTHONY WATKINSON & MICHAEL MABE, THE STM REPORT: AN OVERVIEW OF SCIENTIFIC AND SCHOLARLY JOURNAL PUBLISHING 5 (5th ed. 2018).

[4] Vincent Larivière, Stefanie Haustein & Philippe Mongeon, *The Oligopoly of Academic Publishers in the Digital Era*, 10 PLOS ONE 1, 11-12; *see also* CARL SHAPIRO & HAL R. VARIAN, INFORMATION RULES: A STRATEGIC GUIDE TO THE NETWORK ECONOMY 22 (Harv. Bus. Sch. Press 1999).

[5] Larivière et al., *supra* note 4, at 11.

to purchase scientific publications."[6] This offsets the high fixed costs, a unique feature of information goods, and turns academic journals into *atypical information goods*.[7]

Partial blame for the situation can be attributed to the market structure of academic publishing. Five publishers account for more than 53% of all papers published, with the concentration in some disciplines such as psychology and chemistry being as high as 71%.[8] The largest academic publisher, Elsevier, enjoys 16% of the total market share[9] and recorded over $3 billion in revenue during 2017-18.[10] Elsevier's profit margins have grown from 30.6% in 2006[11] to 34% in 2014[12] to over 37.12% in 2018.[13] Other prominent market players also report similar margins, with Springer Nature reporting 22.8%,[14] Wiley 28.3%, and Taylor and Francis 35.7%.[15]

Reconciling publishers' profit margins with the serials crisis is not easy.[16] Academic publishers have developed a robust digital infrastructure that facilitates easy and wide dissemination of an author's research. They have also managed to coalesce a global network of academics and subject experts to create and maintain journal brands that ensure the credibility and dependability of academic research.

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[6] SCI. & TECH. COMM., SCIENTIFIC PUBLICATIONS, REPORT, 2003-4, HC 399-1, at ¶ 69 (UK); *see also* Stephen Bosch & Kittie Henderson, *Predicting the Future in 3,000 Words and Charts: The Library Journal Series Pricing Article*, 74 SERIALS LIBRARIAN 224 (2018) (discussing pricing trends and issues in the serials industry and academic libraries, as examined in annual serials pricing studies).

[7] Larivière et al., *supra* note 4.

[8] *Id.*

[9] *Id.* at 10.

[10] Sergio Copiello, *Business as Usual with Article Processing Charges in the Transition Towards OA Publishing: A Case Study Based on Elsevier*, 8 PUBL'NS 3, 7 (2020).

[11] Larivière et al., *supra* note 4, at 10.

[12] Kyle Siler, *Future Challenges and Opportunities in Academic Publishing*, 42 CAN. J. SOCIO. 83, 85 (2017).

[13] Copiello, *supra* note 10, at 7, 9; *see also* Mark W. Neff, *How Academic Science Gave Its Soul to the Publishing Industry*, 36 ISSUES SCI. & TECH. 35, 40 (2020) (stating for 2017, profit margins were 36.8%).

[14] CLAUDIO ASPESI & NICOLE ALLEN ET AL., SPARC* LANDSCAPE ANALYSIS: THE CHANGING ACADEMIC PUBLISHING INDUSTRY – IMPLICATIONS FOR ACADEMIC INSTITUTIONS 21 (2019), http://digitalcommons.unl.edu/scholcom/99.

[15] Larivière et al., *supra* note 4, at 10.

[16] Over the last few decades, scholarly journals have increased prices while library budgets have more or less stagnated. Libraries therefore face difficulties in providing access to academic literature. This situation is known as *the serials crisis*. *See What Is Serials Crisis*, IGI GLOBAL, https://www.igi-global.com/dictionary/serials-crisis/26545 (last visited July 3, 2022).

Publishers often cite these developments to argue that their business model accrues substantial costs.[17] However, if publishers accrue such high costs, how do their profit margins remain as high and steady? Deutsche Bank asked a similar question and confirmed that Elsevier adds little value to academic research.[18]

George Monbiot, writing for *The Guardian* in 2011, described the academic publishing business model as pure *economic parasitism,* where goods subsidised by public funds have to be bought back for public access at exorbitant prices.[19] While the contemporary structure of academic publishing might not reflect this, one of its core ideals has been maximising access to scientific knowledge. This aspiration can be traced back to 1665, when the first scientific journal, *The Philosophical Transactions of the Royal Society*, was established.[20]

In the late 20th century, this aspiration gave shape to the Open Access (OA) movement, which lobbied and argued for removing obstacles to accessing, sharing, and reusing academic literature.[21] Intrinsically tied to the development of the internet, the OA movement coalesced throughout the 1990s and eventually culminated in The Budapest Open Access Initiative of 2002.[22]

Unfortunately, in its over 25 years of existence, the OA movement has not radically changed the academic publishing industry.[23] Recent estimates suggest that only 30% of academic literature archived over the internet is available without paywalls.[24] While the contribution made by the OA movement is significant, the fact remains that of every three articles archived over the internet, two articles remain firmly guarded by steep paywalls.[25] Further, the prominent models of the OA

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[17] DAVID J. BROWN, ACCESS TO SCIENTIFIC RESEARCH: CHALLENGES FACING COMMUNICATIONS IN STM 84 (Walter de Gruyter 2015).

[18] Kenneth R. de Camargo, *Big Publishing and the Economics of Competition*, 104 AM. J. PUB. HEALTH 8, 9 (2014); Beverungen et al., *supra* note 2, at 931-32.

[19] *Academic Publishers Make Murdoch Look like a Socialist,* GUARDIAN (Aug. 29, 2011), https://www.theguardian.com/commentisfree/2011/aug/29/academic-publishers-murdoch-socialist.

[20] Aileen Fyfe, *Journals, Learned Societies and Money: Philosophical Transactions, ca. 1750-1900*, 69 NOTES & RECORDS 277, 291-92 (2015).

[21] Jonathan P. Tennant et al., *The Academic, Economic and Societal Impacts of Open Access: An Evidence-Based Review*, 5 F1000RESEARCH, Sep. 21, 2016, at 1.

[22] *Id.* at 4.

[23] Toby Green, *We've Failed: Pirate Black Open Access Is Trumping Green and Gold and We Must Change Our Approach*, 30 LEARNED PUBL'G 325, 326 (2017).

[24] JOHNSON ET AL., *supra* note 3, at 135-39.

[25] Admittedly, there are studies that suggest that the overall availability of OA is higher than 30%. For reference, see Madian Khabsa & C. Lee Giles, *The Number of Scholarly Documents on*

movement have encountered inherent problems. For example, the Article Processing Charges levied to defray the cost of publishing have witnessed a 16% price increase between 2013-16.[26] This raises pertinent questions on the sustained viability and future relevance of the OA movement.[27]

The lack of an overarching change in academic publishing and the inherent problems with OA publishing models have led to the rise of a new form of OA: *Black OA/ Pirate OA*. Motivated by maximising access, pirate websites have amassed a significant user base.[28] Some of the more prominent "academic pirates," such as Sci-Hub, have managed to provide access to over 68% of the world's scholarly literature.[29] Compared with the OA movement, Sci-Hub offers free access to twice the academic literature (68% and 30%, respectively) in less than ten years of its existence.[30]

However, due to the nature of their activities, academic pirates have been the subject of repeated judicial scrutiny. In 2020, five prominent academic publishers initiated copyright infringement litigation in India against two prominent academic pirates: Sci-Hub and Libgen. The Authors view this litigation as an opportunity for the Indian judiciary to comment on the serials crisis, which plagues the academic community of the 21st century. The present Paper seeks to investigate if the fair

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the Public Web, 9 PLOS ONE e93949 (2014); Alberto Martín-Martín, Rodrigo Costas, Thed van Leeuwen & Emilio Delgado López-Cózar, *Evidence of Open Access of Scientific Publications in Google Scholar: A Large-Scale Analysis*, 12 J. INFORMETRICS 819 (2018). However, after considering many of these reports, Johnson et al. identified that a "balanced assessment is that roughly one third of the scholarly literature was available OA in 2016." JOHNSON ET AL., *supra* note 3, at 135-39.

[26] Sarah Jurchen, *Open Access and the Serials Crisis: The Role of Academic Libraries*, 37 TECH. SERV. Q. 160, 164; MICHAEL JUBB ET AL., RSCH. INFO. NETWORK (RIN), MONITORING THE TRANSITION TO OPEN ACCESS 29 (2017), https://www.elsevier.com/__data/assets/pdf_file/0011/547958/UUK_Report_2018_Final_Digital.pdf.

[27] Green, *supra* note 23, at 326; *see also* John Willinsky & Matthew Rusk, *If Research Libraries and Funders Finance Open Access: Moving Beyond Subscriptions and APCs*, 80 COLL. & RSRCH. LIBRS. 340, 341 (2019); Julie MacLeavy, Richard Harris & Ron Johnston, *The Unintended Consequences of Open Access Publishing – And Possible Futures*, 112 GEOFORUM 9, 10-11 (2020).

[28] Bastian Greshake, *Looking into Pandora's Box: The Content of Sci-Hub and Its Usage*, 6 F1000RESEARCH 541 (2017).

[29] Daniel S. Himmelstein, Ariel Rodriguez Romero, Jacob G. Levernier, Thomas Anthony Murno, Stephen Reid McLaughlin, Bastian Greshake Tzovaras & Casey S. Greene, *Sci-Hub Provides Access to Nearly All Scholarly Literature*, 7 ELIFE 1, 4 (2018), https://doi.org/10.7554/eLife.32822.001.

[30] *Id.*; JOHNSON ET AL., *supra* note 3.

dealing doctrine, an essential part of the copyright regime, can protect Sci-Hub from copyright infringement liability.

Part I of the Paper studies the OA movement and underlines its shortcomings to highlight the emergence and relevance of academic pirates. Part II discusses judicial decisions from different jurisdictions where Sci-Hub has been a part of the litigation. It also examines the relevance of Sci-Hub in the present state of academic publishing along with the moral and ethical justifications for its existence and usage. Part III familiarises the readers with the underlying legal framework, which threatens the continued existence of Sci-Hub and has enabled academic publishers to leverage such a profitable business model. Part IV discusses a decision from an Indian High Court, where requirements of higher education motivated the Court to interpret the Indian copyright law purposively. Part V argues that a purposive interpretation of copyright law may enable a just outcome favouring the "academic pirates."

I
THE OPEN ACCESS MOVEMENT IN ACADEMIC PUBLISHING

The OA movement, at its core, is an argument that all academic literature should be available freely to all users in a form that is "digital, online, free of charge and free of most copyright and licensing restrictions."[31] Professor John Willinsky views the OA movement as "the next step in a tradition that includes the printing press and penny post, public libraries and public schools."[32] The movement seeks to curb two related problems: the access problem and the impact problem.[33]

The access problem is a result of a dramatic increase in the price of academic journals and the restrictions placed by publishers on the reuse of published research.[34] It is closely associated with the serials crisis.[35] With shrinking library budgets and a consistent annual raise of 6% in the price of academic journals, the access problem has reached an "uncomfortable equilibrium."[36] A dataset published in 2018 revealed that universities in the United Kingdom paid over £4 million in

[31] PETER SUBER, OPEN ACCESS 4 (MIT Press 2012).

[32] WILLINSKY, *supra* note 2, at 30.

[33] Elizabeth Gadd & Denise Troll Covey, *What Does "Green" Open Access Mean? Tracking Twelve Years of Changes to Journal Publisher Self-Archiving Policies*, 51 J. LIBRARIANSHIP & INFO. SCI. 106, 107 (2019).

[34] *Id.*; *see also* Stevan Harnad, Tim Brody, François Vallières, Les Carr, Steve Hitchcock, Yves Gingras, Charles Oppenheim, Heinrich Stamerjohanns & Eberhard R. Hilf, *The Access/Impact Problem and the Green and Gold Roads to Open Access*, 30 SERIALS REV. 310 (2004).

[35] Jurchen, *supra* note 26, at 161.

[36] Bosch & Henderson, *supra* note 6, at 226.

2016-17, up from £3.9 million in 2012-13—an 18.9% rise within four years.[37] A dataset published by Stuart Lawson surveyed 160 U.K. universities for the subscription fees paid to ten publishers. The data revealed a payment of £108,031,286 in 2017, £110,011,988 in 2018, and £112,800,677 in 2019—an increase of £4,769,391 within three years.[38]

The impact problem is an obvious result of the access problem.[39] Without access to scholars' research, the potential impact of the scholarship is never fully realised. This negatively affects the recognition of individual scholars, impedes scientific progress, and demotivates the efforts of funders who support academic research.[40]

Before the 1950s, journals did not operate commercially and favoured practices that are mere aspirations of the present-day OA movement.[41] The physical and biological sciences scholars were among the first academics who identified the potential of OA publishing and exemplified its viability. In August 1991, Professor Paul Ginsparg launched the arXiv.org platform, arguably the first repository promoting OA in publishing.[42] arXiv was developed "to allow any researcher worldwide with network access to submit and read full-text articles, giving equal entry to everyone from graduate students up."[43]

The OA movement is marred by many conflicting definitions.[44] However, three influential public statements laid the foundation for the OA movement. The definitions from the three statements can help in defining and theorising the

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[37] Rachel Pells, *Top Universities' Journal Subscriptions "Average £4 Million,"* TIMES HIGHER EDUC. (June 12, 2018), https://www.timeshighereducation.com/news/top-universities-journal-subscriptions-average-4-million-pounds.

[38] Stuart Lawson, *Journal Subscription Expenditure in the UK 2017-2019*, ZENODO (May 15, 2020), 10.5281/zenodo.3828461.

[39] Harnad et al., *supra* note 34, at 314 ("Other researchers must find the findings useful, as proved by their actually using and citing them. And to be able to use and cite them, they must first be able to access them. That is the research article access/impact problem.").

[40] Tennant, *supra* note 2, at 3.

[41] Aileen Fyfe, *Publishing the Philosophical Transactions: The Social, Cultural and Economic History of a Learned Journal*, 4 IMPACT 33, 35 (2018).

[42] Joe Miller, *Why Open Access to Scholarship Matters*, 10 LEWIS & CLARK L. REV. 733, 734 (2006).

[43] Paul Ginsparg, *ArXiv at 20*, 476 NATURE 145, 146 (2011).

[44] Amy E.C. Koehler, *Some Thoughts on the Meaning of Open Access for University Library Technical Services*, 32 SERIALS REV. 17, 18-19 (2006).

movement.[45] John R. Beatty has summarised the three definitions in the following table:[46]

Definitions of Open Access (*Adapted verbatim from John R. Beatty)*

Statement	Type of Work	Access	Methods	Reuse Rights
Budapest, Open Access Initiative, 2002	Peer-reviewed journal literature	Online at no cost to readers	Recommends self-archiving and OA journals	Read, copy, print, distribute, publicly display, search, index, feed into software
Bethesda Statement on OA Publishing, 2003	Primary scientific literature	Free, irrevocable, worldwide, perpetual right of access	Requires deposit into at least one online repository	Use, copy, print, distribute, publicly display, make, and distribute derivative works
Berlin Declaration on Open Access to Knowledge in Science and Humanities, 2003	Original scientific search results, raw data, source materials, etc.	Free, irrevocable, worldwide right of access	Requires deposit into at least one online repository	Use, copy, print, distribute, publicly display, make, and distribute derivative works

The OA movement has developed alongside the internet and places immense reliance on the internet's ability to remove the barriers of price and permission in academic publishing.[47] Referring to the internet, the Budapest Open Access Initiative noted, "An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment . . . . The new technology is the Internet."[48]

[45] Jurchen, *supra* note 26, at 161.

[46] John Beatty, *Revisiting the Open Access Citation Advantage for Legal Scholarship*, 111 L. LIBR. J. 573, 578-80 (2019).

[47] Saimah Bashir, Sumeer Gul, Shazia Bashir, Nahida Tun Nisa & Shabir Ahmad Ganaie, *Evolution of Institutional Repositories: Managing Institutional Research Output to Remove the Gap of Academic Elitism*, J. LIBRARIANSHIP & INFO. SCI. 1, 3-4 (2021).

[48] SUBER, *supra* note 31, at 19 (quoting *Budapest Open Access Initiative*, BUDAPEST OPEN ACCESS INITIATIVE (Feb. 14, 2002), https://www.budapestopenaccessinitiative.org/read/).

There are two ways research can be made OA: the Gold Road and the Green Road.[49] This classification is premised on who provides OA copies of an article: the publisher or the author.

A. Gold Open Access

The Gold Road is a publication model where research is made openly available by the publisher to whom it is submitted,[50] *i.e.*, "free access at the original place of publication."[51] Paramount importance is placed on the journal as a fundamental unit.[52] Walt Crawford defines Gold OA as "immediate full-text online access at no charge to readers."[53] Journals that follow the Gold Road provide similar publication services as conventional journals, including quality control of submissions through peer review and editorial committees.[54] Therefore, Gold OA requires a reform of the existing publication models.[55] The Gold Road to OA contradicts scholarly journals' present "reader-pays" business plan, which means that publishers fostering Gold OA policies must generate an alternative source of revenue.[56]

To understand the economic viability of Gold OA publishing, we need to identify the different types of Gold OA journals.[57] The first group of journals, *free*

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[49] Tennant, *supra* note 2, at 603. Some literature further subcategorizes these open access modes. *See* Heather Piwowar, Jason Priem, Vincent Larivière, Juan Pablo Alerpin, Lisa Matthias, Bree Norlander, Ashley Farley, Jevin West & Stefanie Haustein, *The State of OA: A Large-Scale Analysis of the Prevalence and Impact of Open Access Articles*, PEERJ, Feb. 2018, at 6, https://dx.doi.org/10.7717/peerj.4375.

[50] Mikael Laakso, Patrik Welling, Helena Bukvova, Linus Nyman, Bo-Christer Björk & Turid Hedlund, *The Development of Open Access Journal Publishing from 1993 to 2009*, 6 PLOS ONE 1, 2 (2011), https://dx.doi.org/10.1371/journal.pone.0020961.

[51] CHANGES IN SCIENTIFIC PUBLISHING: A HEURISTIC FOR ANALYSIS 27 (Peter Weingart & Niels C. Taubert eds., African Minds 2017).

[52] Jean-Claude Guédon, *The "Green" and "Gold" Roads to Open Access: The Case for Mixing and Matching*, 30 SERIALS REV. 315, 315-16 (2004).

[53] WALT CRAWFORD, OPEN ACCESS: WHAT YOU NEED TO KNOW NOW 18 (Am. Libr. Ass'n 2011).

[54] MARC SCHEUFEN, COPYRIGHT VERSUS OPEN ACCESS: ON THE ORGANISATION AND INTERNATIONAL POLITICAL ECONOMY OF ACCESS TO SCIENTIFIC KNOWLEDGE 66, 67 (Springer 2015).

[55] Guédon, *supra* note 52, at 315-17.

[56] *Id.* at 315.

[57] Li Zhang & Erin M. Watson, *Measuring the Impact of Gold and Green Open Access*, 43 J. ACAD. LIBRARIANSHIP 337, 339 (2017).

OA/platinum OA, depends on a sponsoring society to cover publishing costs.[58] The second group of journals, *OA journals with APC*, charge authors with article processing charges (APCs). The third kind of journals are *hybrid OA journals*, which work off of the toll-access publishing model and allow a truncated or limited form of OA by providing access to the published material optionally, retrospectively, in a limited manner, or after a certain period.[59]

The APC-funded Gold OA nourishes its revenue stream from authors through APCs, rather than from readers through subscriptions. Therefore, for publishers, "the move to online open access is utopian."[60] Springer served as a pioneer in the move to APC-funded OA with its Springer Open Choice platform, which imposed a flat rate of $3,000 per article.[61] The United Kingdom's report, titled *Monitoring the Transition to Open Access*, stated that over 60% of journals worldwide have an APC-funded OA model in place. By imposing APCs, which generally range from $100 to $6,700,[62] commercial publishers have managed to retain and, in some cases, maximise their profit margins.[63]

However, APC-funded Gold OA and Hybrid OA should not be cited as solutions to the serials crisis. While the two publication models have witnessed tremendous growth,[64] the fact remains that APC-funded Gold OA creates barriers to publications for researchers whose funding institutions lack the budget to cover APC costs.[65] For example, Springer Nature announced their plans of charging $11,390 as APC costs for their 32 journals from 2021.[66] This price translates to just under

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[58] *See* A. Townsend Peterson et al., *Open Access Solutions for Biodiversity Journals: Do Not Replace One Problem with Another*, 25 DIVERSITY & DISTRIBS. 5, 7 (2019).

[59] SCHEUFEN, *supra* note 54, at 67; *see also* Steffen Bernius, Matthias Hanauske, Wolfgang König & Berndt Dugall, *Open Access Models and Their Implications for the Players on the Scientific Publishing Market*, 39 ECON. ANALYSIS & POL'Y 103, 106 (2009) (discussing whether hybrid OA journals should be considered part of the Gold OA movement since they only conditionally fulfil the OA mandate).

[60] MacLeavy et al., *supra* note 27, at 10 (noting that academic publishers' profits are guaranteed "unless the charges they levy on authors can be regulated").

[61] Jurchen, *supra* note 28, at 162.

[62] *Id.*

[63] Órla O'Donovan, *What Is To Be Done About the Enclosures of the Academic Publishing Oligopoly?*, 54 CMTY. DEV. J. 363, 364 (2019); MacLeavy et al., *supra* note 27, at 10.

[64] The number of OA journals has skyrocketed in the recent past. The Directory of Open Access Journals has increased its list from around 33 journals in 2002 to 9,900 journals in 2014 to over 16,500 journals in July 2021. *See* SCHEUFEN, *supra* note 54, at 74-79.

[65] MacLeavy et al., *supra* note 27, at 11.

[66] Holly Else, *Nature Journals Reveal Terms of Open-Access Option*, 588 NATURE 19, 19 (2020).

₹850,000—a steep cost for most academics, particularly in developing countries such as India.

Hybrid OA journals, on the other hand, enjoy a very obvious advantage. Referred to as "double-dipping," Hybrid OA journals can leverage their publication model to recover the price of an article twice: first, when an author pays APCs and second, when a subscription to the journal is sold to academic libraries.[67] Even the editorial boards of some Hybrid OA journals have expressed their concerns about the APC-funded publication model and issues such as double-dipping.[68]

APCs can be viewed as a tax on research publications. The higher a university's research output, the higher its payments towards APCs. Michael Levine-Clark has discussed such a situation in the context of the California Institute of Technology. If all research originating from the Institute had been published within an APC-funded model, the Institute would have spent $7.5 million on publication costs in 2016. These costs are more than double the subscription costs ($3.1 million) paid by the Institute in 2016.[69]

The APC-funded model may also lead to elitism. Early-career researchers and those working with smaller universities may not be able to pay high APCs.[70] Support for publication costs will eventually have to be rationed by universities and institutions. Such rationing would favour academics and researchers who can ensure a supply of funds from outside the institutions "to the probable detriment of humanities and social sciences scholars."[71] This can potentially create a group of self-perpetuating elite researchers.[72]

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[67] Bernhard Mittermaier, *Double Dipping in Hybrid Open Access – Chimera or Reality?*, SCIENCEOPEN RSCH., May 25, 2015, at 10, https://dx.doi.org/10.14293/S2199-1006.1.SOR-SOCSCI.AOWNTU.v1. After considering the policies of over 24 publishers, Mittermaier concludes that "there is apparently no publisher who never double dips. The spectrum ranges from 100% double dipping to very general statements that cannot be verified on price setting and partial price reductions . . . right up to a case with supposed 0% double dipping . . . ." *Id.*

[68] O'Donovan, *supra* note 63.

[69] Michael Levine-Clark, *Open Access and Its Impact on Access and Subscriptions*, 28 INFO. SERVS. & USE 41, 43 (2018), https://dx.doi.org/10.3233/ISU-180008.

[70] MARTIN WELLER, THE BATTLE FOR OPEN: HOW OPENNESS WON AND WHY IT DOESN'T FEEL LIKE VICTORY 57-59 (2014).

[71] MacLeavy et al., *supra* note 27, at 10.

[72] *See* WELLER, *supra* note 70, at 57-59 ("Ironically, openness may lead to elitism. If an author needs to pay to publish, then, particularly in times of austerity, it becomes something of a luxury. New researchers or smaller universities won't have these funds available.").

Therefore, arguing in favour of APC-funded Gold or Hybrid Open Access is potentially synonymous with replacing the problem of academic publishing from exorbitant subscription costs to ever-rising APCs without affecting the publishers' profit margins.[73] It can dilute decades' worth of efforts to move away from a *commercial publishing infrastructure* to a *public non-commercial infrastructure for open scientific communication*.[74]

B. Green Open Access

Green OA means self-archiving of the research by an author.[75] It places paramount importance on the article or research as a fundamental unit.[76] In general, the Green OA option "allows an author to post some version of the article" on the internet in a freely available manner.[77] From pre-print versions[78] to versions that have been published in toll-access journals,[79] publication of a manuscript at any stage qualifies as Green OA.

The Green Road to OA remains independent from the business of online publishing. It works "in parallel" to the conventional publishing model, serving as a "supplement to toll access."[80] The essence of Green OA and self-archiving is best captured in Professor Jean-Claude Guédon's statement: "[Self-archiving] simply aims at improving the research impact of established scientists and little else. If it should help (or hurt) other categories or people, so be it, but it is neither its concern nor its worry."[81] Self-archiving is not novel for the academic community. Professor John Willinsky notes:

> [T]he self-archiving concession follows on the tradition of publishers sending neat bundles of offprints to authors, who then sent them off with a warm note to colleagues, students, and family . . . . The

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[73] Peterson et al., *supra* note 58, at 7; Beverungen et al., *supra* note 2, at 933; Siler, *supra* note 12, at 87-89.

[74] *See* Humberto Debat & Dominique Babini, *Plan S in Latin America: A Precautionary Note*, 11 SCHOLARLY & RSCH. COMMC'N 1, 3-4 (2020).

[75] Bo-Christer Björk, Mikael Laakso & Patrik Welling, *Anatomy of Green Open Access*, 65 J. ASS'N INFO. SCI. & TECH. 237, 237 (2014).

[76] Guédon, *supra* note 52, at 315-16.

[77] Beatty, *supra* note 46, at 580.

[78] Laakso et al., *supra* note 50, at 2.

[79] John Houghton & Alma Swan, *Planting the Green Seeds for a Golden Harvest: Comments and Clarifications on "Going for Gold,"* 19 D-LIB MAG. (2013).

[80] Guédon, *supra* note 52, at 316.

[81] *Id.*

> difference is that in archiving a work, the author opens and extends access to it on a more democratic and global basis . . . .[82]

It is arguably the most cost-effective and affordable means for the promotion of OA.[83]

Green OA copies can be found at many online locations, including institutional repositories, subject repositories, and personal/department websites.[84] Articles can also be submitted to academic social networks such as the Social Science Research Network (SSRN).[85] Owing to the push provided by the larger OA movement, the number of online repositories has seen a significant upsurge. The Directory of Open Access Repositories[86] listed only 128 repositories in 2005,[87] which rose to approximately 2,000 in 2012 and over 5,000 in 2021.[88] Professor Ginsparg's arXiv.org is an example of a subject-based repository with over 2 million submissions and over 2 billion downloads.[89]

Considering the statistical evidence, the Green OA Road has arguably become an integral part of the more extensive OA movement. However, we are yet to understand: What is the overall prevalence of OA publishing? A study published in 2018 notes that only roughly one in three journal articles is available through OA.[90] This proportion includes Green OA publishing, including pre-print versions of an article where authors may archive a version of their research that is not peer-reviewed. The findings on such pre-print versions may not be verified. Relying on such unverified findings can be difficult. Even if we ignore the reliability of Green OA, it is interesting to see that, in over 25 years of its existence, the OA movement has only freed roughly 30% of all academic literature.

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[82] WILLINSKY, *supra* note 2, at 48.

[83] Björk et al., *supra* note 75, at 240-41.

[84] *Id.* at 239.

[85] SSRN, https://www.ssrn.com/index.cfm/en/ (last visited July 5, 2022).

[86] OPENDOAR, https://www.jisc.ac.uk/opendoar (last visited July 5, 2022).

[87] Gadd & Covey, *supra* note 33, at 107.

[88] *OpenDOAR Statistics*, OPENDOAR, https://v2.sherpa.ac.uk/view/repository_visualisations/1.html (last visited July 5, 2022).

[89] *arXiv Monthly Submissions*, CORNELL U., https://arxiv.org/stats/monthly_submissions (last visited July 5, 2022); *arXiv Monthly Downloads*, CORNELL U., https://arxiv.org/stats/monthly_downloads (last visited July 5, 2022).

[90] JOHNSON ET AL., *supra* note 3, at 135-39; *see also* Piwowar et al., *supra* note 49, at 10.

C. Open Access Movement in India

Having understood the development and prevalence of the OA movement globally, this Part studies the development and relevance of the movement in India. Indian mathematicians, computer scientists, and biologists were amongst the first to participate in global OA initiatives by depositing pre-print versions of their articles in the arXiv repository.[91] A meeting conducted in 1999 at the Indian Academy of Sciences, Bangalore—a society registered for open science—can be traced back as one of the first calls to public access within the Indian research community. During the meeting, participants underlined the argument for open access to the public data prepared and stored by the Survey of India.[92] By 2002, initial steps for promoting Open Access initiatives started gaining traction at many institutes in India. In 2002, the Indian Institute of Science (IISc) established the first Indian electronic repository: Eprints@IISC.[93]

Apart from institutional mandates, the funders of Indian research also started promoting Open Access. In 2011, the Council of Scientific and Industrial Research (CSIR)—an autonomous organisation set up by the Government of India in 1942—issued an Open Access Mandate. Each laboratory funded by the CSIR was required to create an interoperable OA repository.[94] All of the journals published by the CSIR-funded laboratories were required to be made OA compliant. In 2014, two departments under the Ministry of Science and Technology published an Open Access Policy.[95] The policy clearly articulated that since the funds disbursed by the two departments are public funds, the knowledge generated from this research should be publicly accessible. The policy encouraged institutions to create institutional repositories, which, it was hoped, would directly feed into a central harvester: www.sciencecentral.in. Another significant step towards the OA movement in India was signing the Delhi Open Access Declaration (DDOA) in

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[91] Vivek Kumar Singh, Rajesh Piryani & Satya Swarup Srichandan, *The Case of Significant Variations in Gold–Green and Black Open Access: Evidence from Indian Research Output*, 124 SCIENTOMETRICS 515, 517 (2020).

[92] R. Ramachandran, *Public Access to Indian Geographical Data*, 79 CURRENT SCI. 450, 450 (2000).

[93] Francis Jayakanth, Filbert Minj, Usha Silva & Sandhya Jagirdar, *EPrints@IISc: India's First and Fastest Growing Institutional Repository*, 24 OCLC SYS. & SERVS. 59, 62 (2008).

[94] CSIR OPEN ACCESS MANDATE, http://www.csircentral.net/mandate.pdf (last visited Apr. 18, 2022); *see also* B.S. Shivaram & B.S. Biradar, *Grey Literature Archiving Pattern in Open Access (OA) Repositories with Special Emphasis on Indian OA Repositories*, 37 ELEC. LIBR. 95, 96 (2019).

[95] DEP'T BIOTECHNOLOGY & DEP'T SCI. & TECH., MINISTRY SCI. & TECH., GOV'T INDIA, DBT AND DST OPEN ACCESS POLICY (2014), http://dst.gov.in/sites/default/files/APPROVED%20OPEN%20ACCESS%20POLICY-DBT&DST(12.12.2014)_1.pdf.

2018. The stakeholders adopted a ten-point agenda for ensuring the availability of research literature and the dissemination of research outputs.[96]

However, institutional mandates have largely remained checkered, and the OA landscape in India remains fractured without a national OA mandate.[97] In December 2020, the Government of India proposed a new, ambitious "One Nation, One Subscription" policy, where "for one centrally negotiated payment, all individuals in India will have access to journal articles."[98] The current policy continues to subscribe to the "reader-pays" subscription model and does not subscribe to the "author-pays" OA models advocated by European funders who formed cOAlition S.[99] Such a policy confirms the traditional business model of academic publishing and furthers an every-country-for-themselves policy, which can be detrimental to the global interests in open science and knowledge.[100]

Coming to the relevance of OA publishing in India, reports suggest that around 24.19% of scholarly articles published by Indian authors in the past five years were available for OA via either the Gold or the Green OA Road.[101] Comparing this to the average proportion of OA literature available worldwide, which stands at roughly 33%,[102] OA publications in India are slightly lower.[103] Among the OA roads in India, the Gold OA Road is the most significant, with about 10-12% of OA articles published via the Gold Road. In comparison, about 6% of OA articles follow the Green OA model.[104]

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[96] Anup Kumar Das, *Delhi Declaration on Open Access 2018: An Overview*, 65 ANNALS LIBR. & INFO. STUDS. 83, 83-84 (2018).

[97] Anubha Sinha, *Research Publishing: Is "One Nation, One Subscription" Pragmatic Reform for India?*, WIRE SCI. (Oct. 23, 2020), https://science.thewire.in/the-sciences/india-research-publishing-open-access-one-nation-one-subscription-k-vijayraghavan/.

[98] *See* DEP'T SCI. & TECH., MINISTRY SCI. & TECH., GOV'T INDIA, DRAFT: SCIENCE, TECHNOLOGY, AND INNOVATION POLICY (2020), https://dst.gov.in/sites/default/files/STIP_Doc_1.4_Dec2020.pdf.

[99] For details about Plan S, see Debat & Babini, *supra* note 74.

[100] *See* Aniruddha Malpani, *The Robin Hood Dilemma: Is It Ethical to Use "Unethical" Means to Achieve Something Good?*, 5 INDIAN J. MED. ETHICS 170, 171 (2020); *see also* Dasapta Erwin Irawan, Juneman Abraham, Rizqy Amelia Zein & Sridhar Gutam, *India's Plan to Pay Journal Subscription Fees for All Its Citizen May End Up Making Science Harder to Access*, CONVERSATION (Nov. 2, 2020), https://theconversation.com/indias-plan-to-pay-journal-subscription-fees-for-all-its-citizen-may-end-up-making-science-harder-to-access-147444.

[101] Martín-Martín et al., *supra* note 25, at 830; Singh et al., *supra* note 91, at 522-23.

[102] JOHNSON ET AL., *supra* note 3, at 135-39.

[103] Singh et al., *supra* note 91, at 522-23.

[104] *Id.* at 523-24.

II
BLACK OPEN ACCESS: PIRATICAL ACCESS TO NEARLY ALL SCIENTIFIC LITERATURE

Only a third of the world's research has complied with OA publishing in roughly 20 years of the movement's existence. While significant, it is an underwhelming development. Complex institutional, political, financial, and economic conditions that limit access to knowledge at the geographic and institutional periphery of academia[105] have given rise to the third road to OA: the "Black" Road.[106]

The past decade has witnessed the rise and fall of many shadow libraries, including Textz.org, a*.org, monoskop, and Library.nu.[107] The public catalogues of these libraries made them vulnerable to judicial sanctions. Library.nu was one of the first victims of overarching judicial sanctions when, in 2015, a group of seventeen publishers were granted an injunction against the website in the United States.[108] However, it was arguably the high-profile investigation into Aaron Swartz, the founder of Reddit and the author of Guerrilla Open Access Manifesto, along with the open defiance of the academic publishing model by Sci-Hub that brought the Black Open Access movement to the forefront of scholarly debate and judicial scrutiny.[109]

The most important shadow library—and one which is of primary interest for the present Paper—Sci-Hub, has also been the subject of many litigations in various jurisdictions. In what has been identified as "the largest copyright infringement case

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[105] Balázs Bodó, Dániel Antal & Zoltán Puha, *Can Scholarly Pirate Libraries Bridge the Knowledge Access Gap? An Empirical Study on the Structural Conditions of Book Piracy in Global and European Academia*, 15 PLOS ONE 1, 2 (2020).

[106] The use of the term "Black OA" is not a comment on the possible legality of Sci-Hub and associated shadow libraries. Bo-Christer Björk, *Gold, Green, and Black Open Access*, 30 LEARNED PUBL'G 173, 173 (2017). Björk uses the colour black to refer to pirated academic literature, as the colour has an affinity to the classical pirate flag. He does not use the term "Grey OA," as it already has an established meaning in the context of scholarly publishing covering theses, government reports, etc.

[107] *See* Balázs Bodó, *The Genesis of Library Genesis: The Birth of a Global Scholarly Shadow Library*, *in* SHADOW LIBRARIES: ACCESS TO KNOWLEDGE IN GLOBAL HIGHER EDUCATION 25, 26 (Joe Karaganis ed., 2018).

[108] Bodó et al., *supra* note 105, at 26-27.

[109] *See id.*, at 3; *see also* Stephen Witt, '*The Idealist: Aaron Swartz and the Rise of Free Culture on the Internet,' by Justin Peters*, N.Y. TIMES (Jan. 8, 2016), https://www.nytimes.com/2016/01/10/books/review/the-idealist-aaron-swartz-and-the-rise-of-free-culture-on-the-internet-by-justin-peters.html.

in the history of the U.S. and the history of the world,"[110] Elsevier, in 2017, secured a $15 million injunction against Sci-Hub. The American Chemical Society (ACS) was also granted an injunction with damages to the tune of $4.8 million.[111] Sci-Hub has also faced injunctions and blocking orders in France, Russia, and Sweden.[112] However, despite the judicial orders, the website continues to operate through mirror sites and proxy servers.[113] Neither Elsevier nor ACS could recover any of the $19.8 million worth of damages awarded to them.[114]

The following Part analyses the relevance of the Sci-Hub database. It also addresses the ethical and moral justifications of Sci-Hub's activities.

A. The Development and Contemporary Relevance of Sci-Hub

Sci-Hub has emerged as one of the largest shadow libraries of academic articles. Frustrated by the models of academic publishing, Alexandra Elbakyan created Sci-Hub, which went live on September 5, 2011.[115] Long before creating Sci-Hub, Elbakyan first honed her hacking skills at Kazakh University and then moved to Moscow, where she worked in computer security. After Moscow, Elbakyan moved to the University of Freiburg in Germany in 2010, after which she did a research internship at the University of Georgia. After completing her internship, Elbakyan returned to Kazakhstan, where she could not access the academic scholarship she needed to conduct her research.[116] In one of her interviews, Elbakyan recounts that she needed access to hundreds of articles, each of which would have cost her around $30.[117] Sci-Hub amassed widespread attention in 2016, which became evident from *Nature* featuring Elbakyan in its "Ten People Who Mattered This Year" list.[118] Interestingly, Sci-Hub's fame and Elbakyan's citation came

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[110] Albert N. Greco, *The Kirtsaeng and SCI-HUB Cases: The Major U.S. Copyright Cases in the Twenty-First Century*, 33 PUBL'G RSCH. Q. 238, 243 (2017).

[111] Andrea Widener, *ACS Prevails over Sci-Hub in Copyright Suit*, 95 CHEM. & ENG'G NEWS 16, 16 (2017).

[112] Vivek Kumar Singh, Satya Swarup Srichandan & Suji Bhattacharya, *Is Sci-Hub Increasing Visibility of Indian Research Papers? An Analytical Evaluation*, 10 J. SCIENTOMETRIC RSCH. 130, 130 (2021).

[113] *Id.* at 130-31; *see also* OFF. U.S. TRADE REPRESENTATIVE, 2019 REVIEW OF NOTORIOUS MARKETS FOR COUNTERFEITING AND PRIVACY 27 (2019).

[114] Widener, *supra* note 111, at 16.

[115] Himmelstein et al, *supra* note 29, at 2.

[116] *See* John Bohannon, *The Frustrated Science Student Behind Sci-Hub*, 352 SCI. 511 (2016).

[117] Julia Belluz, *Meet Alexandra Elbakyan, the Researcher Who's Breaking the Law to Make Science Free for All*, VOX (Feb. 18, 2016 11:00 AM), https://www.vox.com/2016/2/18/11047052/alexandra-elbakyan-interview.

[118] Richard Van Noorden, *Nature's 10*, 540 NATURE 507, 512 (2016).

around the same time as the U.S. District Court granted an injunction against Sci-Hub on Elsevier's petition.[119]

Sci-Hub provides access to over 68.9% of the world's academic research, including 85% of articles published in toll-access journals.[120] A study conducted in 2018 indicates that out of the 81,609,016 articles identified with Document Object Identifiers (DoIs), Sci-Hub provided access to 56,246,220 articles–over 68% of all scientific literature.[121] Around 85% of paywalled literature, *i.e.*, literature published in toll-access journals, is available on Sci-Hub's database.[122] Sci-Hub provides access to over 97% of articles published in Elsevier's journals.[123]

Further, Sci-Hub's script can download papers on request and fulfil 99% of the download requests made.[124] Therefore, it is possible that apart from the 68.4% of articles available on the database, the remaining 31.6% of articles have never been requested.[125] In 2017, Sci-Hub serviced an average of 458,589 download requests daily.[126] Reports suggest that the search for "Sci-Hub" on Google has increased more than eight times since 2016.[127]

Another notable element of Sci-Hub is how promptly the database archives newly published scholarship. Louis Houle studied the availability of articles published in *Nature* and *Science* to analyse the timeframe within which articles published in the two magazines were archived on the Sci-Hub database. For papers published between September 2016 and June 2017, the Houle study reported that, within 24 hours of publication, Sci-Hub archived all the articles published in *Science*

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[119] T. Scott Plutchak, *Epistemology - Three Ways of Talking About Sci-Hub*, 31 AGAINST GRAIN 60, 61 (2021).

[120] Himmelstein et al., *supra* note 29, at 4; Frederik Sagemüller, Luise Meißner & Oliver Mußhoff, *Where Can the Crow Make Friends? Sci-Hub's Activities in the Library of Development Studies and Its Implications for the Field*, 52 DEV. & CHANGE 670, 671 (2021).

[121] Himmelstein et al., *supra* note 29, at 4.

[122] *Id.* at 1; OFF. U.S. TRADE REPRESENTATIVE, *supra* note 113, at 27.

[123] Himmelstein et al., *supra* note 29, at 5.

[124] Lindsay McKenzie, *Sci-Hub's Cache of Pirated Papers Is so Big, Subscription Journals Are Doomed, Data Analyst Suggests*, SCIENCEINSIDER (July 27, 2017), https://www.science.org/content/article/sci-hub-s-cache-pirated-papers-so-big-subscription-journals-are-doomed-data-analyst.

[125] *Id.*

[126] Himmelstein et al., *supra* note 29, at 13.

[127] Emad Behboudi, Amrollah Shamsi & Gema Bueno de la Fuente, *The Black Crow of Science and Its Impact: Analyzing Sci-Hub Use with Google Trends*, LIBR. HI TECH, Feb. 16, 2021 (analysing the Google search rate of internet users of Sci-Hub in ten countries, including India, over four years using Google Trends).

and 99% of those published in *Nature*. In contrast, Google Scholar archived OA versions of only 9% of articles published in *Science* and 8% published in *Nature*.[128] In ongoing litigation before the Delhi High Court, on December 24, 2020, Sci-Hub was directed not to upload any new articles in which the plaintiffs own copyrights.[129] While it is not clear whether Sci-Hub has complied,[130] the order, if complied with, can potentially dilute the "up to the minute" nature of the database.

Where do Indian scholars and their scholarship fit into this rubric? Sci-Hub provides access to over 91% of Indian scholarship, of which 18.46% of articles were available in some form of OA.[131] A study published in April 2020 reveals that out of 67,857 Indian publication records from 2016, 61,706 were available in the Sci-Hub database.[132] Another study from April 2021 examined a 2017 dataset provided by Sci-Hub containing metadata for almost 329 days to determine the download requests made by Indian scholars and researchers. Out of 150,875,861 download requests, 13,144,241 were from India. Sci-Hub serviced an average of 39,952 Indian download requests daily,[133] making India the third-largest user of the piratic website.[134]

B. Academic Piracy: Civil Disobedience Against Persistent Unfairness

The Sci-Hub database operates in a legal grey area, and many countries continue to block its usage.[135] Despite such injunctions, many members of the

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[128] Louis Houle, *Sci-Hub and LibGen: What If…Why Not?*, IFLA SOCRS SATELLITE MEETING, Aug. 16-17, 2017, at 11-12, http://ifla-test.eprints-hosting.org/id/eprint/1892/.

[129] Elsevier Ltd. v. Elbakyan, CS(COMM) 572/2020, decided on Dec. 24, 2020 (India). Elbakyan's counsel stated that no new articles would be uploaded to the Sci-Hub database. The Court took the counsel's statement on record.

[130] Elsevier Ltd. v. Elbakyan, CS(COMM) 572/2020, decided on Sept. 15, 2021 (India). Sci-Hub uploaded 24 million new articles on September 5, 2021. The plaintiffs initiated contempt proceedings against Sci-Hub for having violated the undertaking filed before the Court. Sci-Hub argued that the undertaking had expired on March 8, 2021, after which point it had not been extended further.

[131] Vivek Kumar Singh, Satya Swarup Srichandan & Sujit Bhattacharya, *What Do Indian Researchers Download from Sci-Hub? An Analytical Introspection*, 10 J. SCIENTOMETRIC RSCH. 259, 263 (2021).

[132] Singh et al., *supra* note 91, at 524.

[133] Singh et al., *supra* note 130, at 260.

[134] *Id.* at 262.

[135] Elsevier Inc. v. Sci-Hub, No. 15-CV-4282 (RWS), 2017 U.S. Dist. LEXIS 147462, at *3-4 (S.D.N.Y. June 21, 2017) (awarding a permanent injunction and damages against Sci-Hub); Quirin Schiermeier, *US Court Grants Elsevier Millions in Damages from Sci-Hub*, NATURE, June 22, 2017; The Wire Staff, *Elsevier Forces ISP to Block Access to Sci-Hub, ISP Blocks Elsevier As Well*, WIRE, Nov. 5, 2018, https://science.thewire.in/the-sciences/elsevier-forces-isp-to-block-

academic community believe that it is not ethically incorrect to download pirated scholarship. When surveyed in 2017 at a United Kingdom Serials Group Conference, barely any delegates had individually blocked Sci-Hub or felt that it should be blocked.[136] A similar survey with over 11,000 respondents in 2016 revealed that 88% believed that it is not wrong to download pirated papers.[137] Writing for *The Guardian*, George Monbiot noted, "[A]s a matter of principle, do not pay a penny to read an academic article. The ethical choice is to read the stolen material published by Sci-Hub."[138] Some scholars have gone even further to argue that the goals of Sci-Hub are altruistic and point to the implosion of the present-day academic publishing models.[139] Dr. John Bohannon sums up this scholarly debate when he says that Sci-Hub is "an awe-inspiring act of altruism or a massive criminal enterprise, depending on whom you ask."[140] This Part seeks to explore some normative justifications for the use of Sci-Hub.

Academic publishing is essentially a cooperative arrangement between authors, publishers, and libraries.[141] Cooperative arrangements are premised on fairness principles, and participating parties should equally bear the benefits and burdens of such an arrangement.[142] Publishers' activities—such as forcing libraries into "Big Deal" licensing agreements by clubbing high-impact and low-impact

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access-to-sci-hub-isp-blocks-elsevier-as-well/ (discussing Elsevier's victorious lawsuit against Swedish ISPs); *Scientific Publishing Houses Win Copyright Case Against ISPs*, HOYNG ROKH MONEGIER (Nov. 13, 2019), https://www.hoyngrokhmonegier.com/news-insights/scientific-publishing-houses-win-copyright-case-against-isps (reporting on a Brussels court's order to Belgian ISPs to block Sci-Hub domains); Dalmeet Singh Chawla, *Sci-Hub Blocked in Russia Following Ruling by Moscow Court*, CHEM. WORLD, Dec. 3, 2018 (discussing Moscow City Court's ruling that Sci-Hub should be blocked throughout Russia).

[136] Green, *supra* note 23, at 325.

[137] John Travis, *In Survey, Most Give Thumbs-Up to Pirated Papers*, SCIENCEINSIDER (May 6, 2016), https://www.science.org/content/article/survey-most-give-thumbs-pirated-papers.

[138] George Monbiot, *Scientific Publishing Is a Rip-Off. We Fund the Research – It Should Be Free*, GUARDIAN (Sept. 13, 2018) https://www.theguardian.com/commentisfree/2018/sep/13/scientific-publishing-rip-off-taxpayers-fund-research.

[139] Llarina González-Solar & Viviana Fernández-Marcial, *Sci-Hub, a Challenge for Academic and Research Libraries*, 28 EL PROFESIONAL DE LA INFORMACIÓN 1, 4-5 (2019) (summarizing academic considerations of Sci-Hub as a significant challenge to the traditional publishing model); Malpani, *supra* note 100, at 171 (praising Elbakyan as "completely altruistic").

[140] Bohannon, *supra* note 116 at 511.

[141] Jack E. James, *Pirate Open Access as Electronic Civil Disobedience: Is It Ethical to Breach the Paywalls of Monetized Academic Publishing?*, 71 J. ASS'N INFO. SCI. & TECH. 1500, 1501 (2020).

[142] JOHN RAWLS, A THEORY OF JUSTICE 3-5 (rev. ed. 1999).

serials,[143] including non-disclosure agreements that allow price-discrimination[144]—create a perceived lack of fairness in the dealings of academic publishers. Further, the inputs provided by authors, their institutes, and the public (as funders of public research) in creating academic scholarship far outweigh the value additions by academic publishers. Despite what Deutsche Bank referred to as "relatively little" value addition,[145] publishers and journals extract exorbitant monetary compensation and, in doing so, reduce the circulation of and access to research.[146]

Apart from disregarding the cooperative nature of their agreements, the academic publishing industry works on a "double appropriation" basis.[147] Without compensating the producers of the knowledge, the publishers often claim intellectual property rights on the knowledge produced by researchers. This same knowledge is then sold back to libraries at "massively inflated" prices, so the producers can again employ this knowledge to create further research.[148] This and similar practices by academic publishers result in frustration within the academic community, which then perceives Sci-Hub (by extension, academic piracy) as a symptom of an exploitative business model rather than a legal pariah.[149]

Professor Ramon Lobato reimagines the copyright system and identifies six different forms of piracy, one of which is *piracy as access*.[150] This unique form of

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[143] The term "Big Deal" was coined by Kenneth Frazier in 2001. It refers to a "comprehensive licensing agreement in which a library or library consortium agrees to buy electronic access to all or a large portion of a publisher's journals for a cost based on expenditures for journals already subscribed to by the institution(s) plus an access fee." *See* Kenneth Frazier, *What's the Big Deal?*, 48 SERIALS LIBR. 49, 50 (2005).

[144] DAVID J. SOLOMON, MIKAEL LAAKSO & BO-CHRISTER BJÖRK, CONVERTING SCHOLARLY JOURNALS TO OPEN ACCESS: A REVIEW OF APPROACHES AND EXPERIENCES 10, 95-99, 155 (Peter Suber ed., 2016) (identifying "specific scenarios that have been used or proposed for transitioning subscription journals to OA so that these scenarios can provide options for others seeking to 'flip' their journals to OA").

[145] Beverungen et al., *supra* note 2, at 931-32 ("Although [Reed Elsevier] 'adds relatively little value to the publishing process,' it has clearly been very successful in extracting value from this process. This combination of a negligible contribution to value on the part of publishers with exceptionally high profit rates is possible because of a double appropriation at the heart of the business model.").

[146] James, *supra* note 141, at 1502.

[147] *Id.*

[148] Beverungen et al., *supra* note 2, at 932.

[149] Siler, *supra* note 12, at 91-92.

[150] Ramon Lobato, *The Six Faces of Piracy: Global Media Distribution from Below*, *in* THE BUSINESS OF ENTERTAINMENT 29, 29-32 (Robert C. Sickels ed., Greenwood Publ'g Grp. 2008). The other forms of piracy are: (1) piracy as theft, (2) piracy as free enterprise, (3) piracy as free speech, (4) piracy as authorship, and (5) piracy as resistance. *Id.* at 20-29.

privacy is motivated by accessibility and economic factors and inspires copyright disobedience due to its "capacity to disseminate culture, knowledge, and capital."[151] Viewing Sci-Hub as a medium of *piracy as access* allows its normative classification to transcend from a mere violation of copyright law to a necessary form of civil disobedience.

Some scholars,[152] including Elbakyan herself,[153] view Sci-Hub as a medium of protesting against copyright law and civil disobedience. For the sake of the present Paper, "civil disobedience" should be interpreted to mean:

> [A] public, nonviolent, conscientious yet political act contrary to law usually done with the aim of bringing about a change in the law or policies of the government. By acting in this way, one addresses the sense of justice of the majority of the community and declares that in one's considered opinion the principles of social cooperation among free and equal men are not being respected.[154]

The internet, for example, provides an interesting avenue for civil disobedience movements.

Elbakyan views Sci-Hub as a vessel for a global overhaul of the academic publishing industry. Sci-Hub is supposed to underline the unfair business models of academic publishers and ensure that knowledge is within reach of the general population.[155] Such motivations arguably align Elbakyan with the more significant OA movement. However, the advocates of the OA movement have continuously ignored the impact of pirate OA in achieving the goals of their movement.[156] Such ignorance or pre-emptive rejection of pirate OA ignores the ability of the citizens of a democratic society to protest against the perceived unfairness of legal conventions through civil disobedience.[157]

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[151] *Id.* at 29-32.

[152] Bodó et al., *supra* note 105, at 2.

[153] Marcus Banks, *What Sci-Hub Is and Why It Matters*, 47 AM. LIBRS. 46, 46 (2016).

[154] RAWLS, *supra* note 142, at 320.

[155] Alexandra Elbakyan & Aras Bozkurt, *A Critical Conversation with Alexandra Elbakyan: Is She the Pirate Queen, Robin Hood, a Scholarly Activist, or a Butterfly Flapping Its Wings?*, 16 ASIAN J. DISTANCE EDUC. 111, 113-16 (2021).

[156] *See also* Piwowar et al., *supra* note 49. In assessing the growing relevance of the OA movement, Piwowar et al. did not even consider the relevance of academic piracy.

[157] James, *supra* note 141, at 1503.

Despite there being two roads to OA—the Green Road and the Gold Road—over 70% of academic literature remains paywalled.[158] Therefore, when George Monbiot argues that the *ethically responsible* manner of accessing academic scholarship is through shadow libraries,[159] he is arguing in favour of a conscientious citizen's moral duty to protest the encumbrances placed by the business model of academic publishing and the relevant legal framework, which deters access to publicly-funded research. Academic piracy can therefore be interpreted as an act of civil disobedience against the perceived unfairness of this transaction, which eventually leads to the monetisation of knowledge.[160]

Given the interesting relationship that Sci-Hub shares with civil disobedience, it is important to understand what is the *unjust law* that Sci-Hub is revolting against. The next Part of the Paper deals with copyright law and its limitations and exceptions.

III
COPYRIGHT LAW EXCEPTIONS: NAVIGATING FAIR USE AND FAIR DEALING

Modern copyright law and its exceptions work within an elaborate system of regional, bilateral, and international intellectual property treaties. The Berne Convention for the Protection of Literary and Artistic Works, the Agreement on Trade-Related Aspects of Intellectual Property Rights, and the multitude of treaties negotiated under the aegis of the World Intellectual Property Organisation are some of the most important multilateral obligations responsible for the present iteration of copyright law.[161]

Copyright law is an intricate balance between creating an incentive structure for rewarding the author's labour and encouraging a benefit structure for society through a free flow of information and stimulation of new creations, ideas, and inventions.[162] This bargain has been evident since the enactment of the first statute that regulated the copyright monopoly. Enacted in 1710, the Statute of Anne regulated the book trade in Great Britain. Section IV of the Act provided a "highly elaborate scheme for averting the monopolistic pricing of books."[163] Justice Sandra

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[158] JOHNSON ET AL., *supra* note 3, at 134-39.

[159] Monbiot, *supra* note 138.

[160] James, *supra* note 141, at 1502-03.

[161] PASCALE CHAPDELAINE, COPYRIGHT USER RIGHTS: CONTRACTS AND THE EROSION OF PROPERTY 36-37 (2017).

[162] Dànielle Nicole DeVoss & James E. Porter, *Why Napster Matters to Writing: Filesharing as a New Ethic of Digital Delivery*, 23 COMPUTS. & COMPOSITION 178, 185 (2006).

[163] The Statute of Anne, 8 Ann. c. 19, § 4 (Eng.); William Cornish, *The Statute of Anne 1709–10: Its Historical Setting*, *in* GLOBAL COPYRIGHT: THREE HUNDRED YEARS SINCE THE STATUTE OF

Day O'Connor from the United States Supreme Court explained this bargain incorporated in modern copyright law as follows:

> The primary objective of copyright is not to reward the labor of authors, but to promote the Progress of Science and useful Arts. To this end, copyright assures authors the right to their original expression, but encourages others to build freely upon the ideas and information conveyed by a work . . . . This result is neither unfair nor unfortunate. It is the means by which copyright advances the progress of science and art.[164]

Justice William Rehnquist later adopted this position and added that copyright law "ultimately serves the purpose of enriching the general public through access to creative works."[165] The statutory monopoly granted by copyright law is "not an inevitable, divine, or natural right that confers on authors the absolute ownership of their creations."[166] There are multiple qualifications to the scope of copyright protection, ranging from a limited monopoly term to a host of limitations and exceptions (L&E). L&Es are essentially carve-outs from the scope of copyright infringement. They allow the use of copyrighted material without the authorisation of the copyright holder.[167] L&Es form an integral part of the copyright law and function on the premise that "creativity requires copying, often generously, and often without payment or permission."[168]

In 1945, Professor Zechariah Chafee, Jr. sought to answer: "What is it that the law of copyright is really trying to accomplish?"[169] Answering the question, he identified six ideals, formulated as desirable ends for the law of copyright. Three of these ideals were affirmative and extended the rationale for protecting the works of a copyright owner, while the other three were negative insomuch as they limited the

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ANNE, FROM 1709 TO CYBERSPACE 14, 24 (Lionel Bently, Uma Suthersanen & Paul Torremans eds., 2010).

[164] Feist Publ'ns, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 349-50 (1991) (internal quotation marks and citations omitted); *see also* M/s Entm't Network (India) Ltd. v. M/s Super Cassette Indus. Ltd., (2008) AIR 2009 SC (Supp) 1150 (India) (reasoning on similar grounds).

[165] Fogerty v. Fantasy, Inc., 510 U.S. 517, 527 (1994).

[166] Pierre N. Leval, *Toward a Fair Use Standard*, 103 HARV. L. REV. 1105, 1107 (1990).

[167] In some cases, equitable payments may be required. *See generally* Jane Ginsburg, *Fair Use for Free, or Permitted-but-Paid?*, 29 BERKELEY TECH. L.J. 1383, 1416-25, 1432-34 (2014) (listing various permitted-but-paid models used by European Union member states and the United States).

[168] William F. Patry, *A Few Observations About the State of Copyright Law*, *in* COPYRIGHT LAW IN AN AGE OF LIMITATIONS AND EXCEPTIONS 85, 89 (Ruth L. Okediji ed., 2017).

[169] Zechariah Chafee, Jr., *Reflections on the Law of Copyright: I*, 45 COLUM. L. REV. 503, 503 (1945).

scope of protection.[170] The fourth ideal postulated that the "protection should not go substantially beyond the purposes of protection."[171] Professor Chafee identified this ideal as the most important goal of copyright policy. The fifth ideal states that the protection afforded to the author "should not stifle independent creation by others."[172] The premise of this ideal is that the very law that has been developed to reward an author's creativity should not suffocate the creativity of others.

However, Professor Chafee's insistence on the relevance of L&Es is not reflected in the international copyright framework. Given the lack of coherent guidance on the manner and structure of L&Es on a supranational-treaty level, different countries have adopted different forms and approaches to L&Es.[173] The international copyright treaties and negotiations have failed to articulate international standards for L&Es to promote access and dissemination of copyrighted material.[174] While new rights and novel forms of protecting copyright-eligible content dominate treaty obligations, the international copyright framework has failed to balance the growth of copyright protection and L&Es.[175] Most L&Es that form part of the international treaty regime are merely permissive, *i.e.*, they only provide that the member states *may* enact L&Es.[176] In its present iteration, this state of the international copyright regime contradicts the ideals of the copyright policy as advocated by Professor Chafee.

While there is a considerable difference between the forms of L&Es adopted by different countries, they are developed within either one of two models: Fair Use or Fair Dealing. The next Part explains these two models in detail. Copyright regimes such as India follow the fair dealing approach, establish a list of enumerated

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[170] *Id.* at 504-15 (describing the six ideals); *see also* GILLIAN DAVIES, COPYRIGHT AND THE PUBLIC INTEREST 244-47 (2d ed. 2002) (summarizing the six ideals).

[171] Chafee, *supra* note 169, at 506-11.

[172] *Id.* at 511-14.

[173] *See generally* Pamela Samuelson, *Justifications for Copyright Limitations and Exceptions*, *in* COPYRIGHT LAW IN AN AGE OF LIMITATIONS AND EXCEPTIONS 12, 15, 24-45 (Ruth L. Okediji ed., 2017) (discussing ten justifications for the existence of L&Es present in the United States and other national copyright laws).

[174] CHAPDELAINE, *supra* note 161, at 36-37, 42.

[175] RUTH L. OKEDIJI, THE INTERNATIONAL COPYRIGHT SYSTEM: LIMITATIONS, EXCEPTIONS AND PUBLIC INTEREST CONSIDERATIONS FOR DEVELOPING COUNTRIES 2 (2006), https://unctad.org/system/files/official-document/iteipc200610_en.pdf.

[176] *See* Daniel J. Gervais, *Making Copyright Whole: A Principled Approach to Copyright Exceptions and Limitations*, 5 U. OTTAWA L. & TECH. J. 1, 10 (2008) (reviewing the history and development of the Berne Convention). *But see, e.g.*, Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled, art. 11, June 27, 2013, S. TREATY DOC. N. 114-6 (providing compulsory exceptions).

exceptions, and regularly update them in line with developments in copyright law.[177] Alternatively, other jurisdictions such as the United States of America follow the fair use approach and do not list any definitive exceptions to copyright infringement. Rather, the courts are called upon to interpret some factors that determine if the defendant's secondary use is fair.[178]

A. Fair Use, Fair Dealing, and Public Interest

1. Fair Use Model: The American Experience

The doctrine of fair use represents "breathing space within the confines of copyright."[179] Fair use reflects a countervailing policy concern that requires limiting the scope of the monopoly provided by copyright legislation. The idea of fair use is expansive and is considered one of the most troublesome concepts of copyright law.[180] The bargain implicit in the fair use doctrine has been explained as follows: "[a]ny use that is deemed by the law to be 'fair' typically creates some social, cultural, or political benefit that outweighs any resulting harm to the copyright owner."[181]

From the genesis of the idea of copyright, some standard of fair use was considered necessary to promote science and useful arts.[182] The concept of fair use first appeared as *fair abridgement* in English judicial decisions as early as 1740.[183] The doctrine was later appropriated within American copyright jurisprudence by Justice Joseph Story in *Folsom v. Marsh,* decided in 1841.[184] The case involved the letters of George Washington, which were published in a set entitled *The Writings of George Washington*. The defendant used selections from the letters to compile a

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[177] *See* Copyright Act, 1957, § 52 (India).

[178] *See* Copyright Act of 1976, 17 U.S.C. §§ 101-1332 (2012).

[179] Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 579 (1994) (holding that the commercial nature of a parody song did not create a presumption against fair use).

[180] Dellar v. Samuel Goldwyn, Inc., 104 F.2d 661, 662 (2d Cir. 1939) (reversing a trial court's order on procedural grounds).

[181] LEE WILSON, FAIR USE, FREE USE AND USE BY PERMISSION: HOW TO HANDLE COPYRIGHTS IN ALL MEDIA 67 (1st ed. 2005).

[182] *Campbell*, 510 U.S. at 575.

[183] Martine Courant Rife, *The Fair Use Doctrine: History, Application, and Implications for (New Media) Writing Teachers*, 24 COMPUTS. & COMPOSITION 154, 165 (2007). For a discussion of "a foundational case in [both] English and American copyright law[,]" see Mark Rose, *The Author in Court: Pope v. Curll* (1741), 10 CARDOZO ARTS & ENT. L.J. 475 (1992).

[184] Folsom v. Marsh, 9 F. Cas. 342, 348 (C.C.D. Mass. 1841). There is some literature which argues that *Folsom* should not be viewed as the point of genesis of the fair use doctrine in the American context. *See* Matthew Sag, *The Prehistory of Fair Use*, 76 BROOK. L. REV. 1371, 1372-73 (2011).

book entitled *The Life of Washington, in the Form of an Autobiography*. In his decision, Justice Story declared that certain uses of a copyrighted work should be considered fair and not attract any penalty under copyright infringement. While the defendant ultimately incurred liability for copyright infringement, *Folsom* articulated the possibility of using a copyrighted work fairly without attracting the penalty from copyright infringement.[185]

Justice Story enunciated the fair use analysis to include "the nature and objects of the selections made, the quantity and value of the materials used, and the degree in which the use may prejudice the sale, or diminish the profits, or supersede the objects, of the original work."[186] This enunciation assumes relevance in modern copyright law, and parallels can be drawn between Justice Story's opinion and the modern-day iteration of the fair use doctrine. Since 1841, the doctrine of fair use has witnessed overwhelming litigation and has become one of the most important limitations on the scope of copyright protection. In 1990, Judge Leval noted, "Fair use should not be considered a bizarre, occasionally tolerated departure from the grand conception of the copyright monopoly. To the contrary, it is a necessary part of the overall design."[187]

The inclusion of the fair use doctrine in copyright law can be interpreted as an acceptance of the principle that "certain acts of copying are defensible when the public interest in permitting the copying far outweighs the author's interest in copyright protection."[188] Amongst many others, user actions found to be protected by fair use include an internet search engine's display of low resolution versions of copyrighted images for the purpose of directing the viewer to the copyright owner's original work,[189] a television viewer's creation of a recording of a broadcast television show for viewing at a later time,[190] and a newspaper's publication of copyrighted photographs in order to inform and entertain readers.[191]

The framework Justice Story articulated in 1841 was codified in Section 107 of the Copyright Act of 1976.[192] Section 107 requires a court to examine any

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[185] *Folsom*, 9 F. Cas. at 348.

[186] *Id.*

[187] Leval, *supra* note 166, at 1110.

[188] Benjamin Ely Marks, *Copyright Protection, Privacy Rights, and the Fair Use Doctrine: The Post-Salinger Decade Reconsidered*, 72 N.Y.U. L. REV. 1376, 1377 (1997).

[189] Perfect 10, Inc. v. Amazon.com, Inc., 508 F.3d 1146, 1176 (9th Cir. 2007); Kelly v. Arriba Soft Corp., 336 F.3d 811, 822 (9th Cir. 2003).

[190] Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 454-56 (1984).

[191] Núñez v. Caribbean Int'l News Corp., 235 F.3d 18, 25 (1st Cir. 2000).

[192] 17 U.S.C. § 107.

secondary use by a defendant on four pedestals.[193] The results of such exploration are to be weighed together to determine if the secondary use is eligible for protection within the fair use doctrine.[194] These four factors are:

1. **"[T]he purpose and character of the [infringing] use"**[195]: The first factor requires a comprehensive analysis of the infringing use. Determining the purpose of the secondary use requires an analysis of multiple aspects, including the commercial relevance of the secondary use.[196] To adjudge the character of the secondary use, courts consider if the secondary work "supersedes the objects of the original creation."[197] If the secondary use qualifies as transformative or serves an educational purpose, it is usually persuasive for a finding of fair use.[198]

2. **"[T]he nature of the copyrighted work"**[199]: Different copyrighted works deserve different levels of protection.[200] For example, public policy dictates that factual works should be widely disseminated when compared to fictional works. Therefore, the secondary use of a factual work would be protected within fair use with relative ease compared to the secondary use of a creative or fictional work.[201]

3. **"[T]he portion used in relation to the copyrighted work as a whole"**[202]: The third factor analyses if the secondary use employs more copyrighted work than is necessary. The analysis is both quantitative and qualitative. The nature and purpose of the secondary use becomes very important when addressing

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[193] *Id.* at § 107(1)-(4).

[194] Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 576-77 (1994). For an analysis of the subfactor considerations that inform and drive the outcomes of the four statutory factors and such considerations' effect on the outcome of the overall fair use test, see Barton Beebe, *An Empirical Study of U.S. Copyright Fair Use Opinions, 1978-2005*, 156 U. PA. L. REV. 549, 594-621 (2008) and Barton Beebe, *An Empirical Study of U.S. Copyright Fair Use Opinions Updated, 1978-2019*, 10 NYU. J. INTELL. PROP. & ENT. L. 1, 23-33 (2020).

[195] 17 U.S.C. § 107(1).

[196] Basic Books, Inc. v. Kinko's Graphics Corp., 758 F. Supp. 1522, 1530 (S.D.N.Y. 1991).

[197] *Campbell*, 510 U.S. at 579 (internal quotation marks and brackets omitted).

[198] Kyle Richard, *Fair Use in the Information Age*, 25 RICH. J.L. & TECH. 1, 14 (2018) (assessing recent circuit court decisions).

[199] 17 U.S.C. § 107(2).

[200] Leval, *supra* note 166, at 1117.

[201] Harper & Row Publishers, Inc. v. Nation Enters., 471 U.S. 539, 563 (1985) ("The law generally recognizes a greater need to disseminate factual works than works of fiction or fantasy.").

[202] 17 U.S.C. § 107(3).

the sufficiency of subsequent use.[203] However, it is essential to mention that "[t]here are no absolute rules regarding how much of a copyrighted work may be copied and still be considered fair use."[204]

4. **"[T]he effect of the use upon the potential market for or value of the copyrighted work"**[205]: The fourth factor considers the market harm caused by the secondary use and whether the *unrestricted and widespread* secondary use would have a substantial adverse effect on the market for the original work,[206] or "usurps the market of the original work."[207] The primary analysis in the fourth factor is that the secondary use should not serve as a *substitute for the original work.*[208]

In *Campbell v. Acuff-Rose*, the United States Supreme Court shifted the contours of the doctrine of fair use: the Court held that the four factors have to be treated together, and a court should not provide any preference to any one of the four factors.[209] Within the distinction between rules and standards—where, unlike rules, standards give vague guidelines to citizens and more discretion to courts—the fair use doctrine is a standard and not a rule.[210] When enacting Section 107, Congress intended to retain adequate room for judicial interpretation of the limits of copyright protection and therefore adopted deliberately vague statutory guidelines.[211] No relative weights have been provided to the four factors, and any additional factors that a court deems relevant can be considered.[212]

2. Fair Dealing Model: The Indian Movement

The fair dealing doctrine developed from English judicial practice in the early 19th century and was first codified in the United Kingdom by the Copyright Act of

[203] Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 586-87 (1994).
[204] Maxtone-Graham v. Burtchaell, 803 F.2d 1253, 1263 (2d Cir. 1986).
[205] 17 U.S.C. § 107(4).
[206] *Campbell*, 510 U.S. at 590.
[207] Nxivm Corp. v. Ross Inst., 364 F.3d 471, 482 (2d Cir. 2004).
[208] *Campbell,* 510 U.S. at 591.
[209] *Id.* at 578.
[210] Justin Hughes, *Fair Use and Its Politics – at Home and Abroad*, *in* COPYRIGHT LAW IN AN AGE OF LIMITATIONS AND EXCEPTIONS 234, 237-40 (Ruth L. Okediji ed., 2017).
[211] Marks, *supra* note 188, at 1377-78; S. REP. NO. 94-473 (1975); H.R. REP. NO. 94-1476 (1975), *reprinted in* 1975 U.S.C.C.A.N. 5659, 5680.
[212] Marks, *supra* note 188, at 1378; Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 476 (1984) (considering the likelihood of future harm in fair use analysis separately from any particular statutory factor).

1911.[213] David Bradshaw traces the doctrine of fair dealing to *Cary v. Kearsley*, decided in 1802.[214] The plaintiff in *Cary* had published a book after surveying different roads. The defendant copied verbatim passages from the plaintiff's book. Lord Ellenborough instructed the jury to decide if what had been transmitted in the defendant's secondary work "was fairly done with a view of compiling a useful book for the benefit of the public . . . or taken colourable, merely with a view to steal the copy-right of the [p]laintiff."[215]

While the term "fair dealing" does not appear in the case, "fairly doing," "fairly adopting" and "using fairly" are repeatedly used in the judgement. Bradshaw acknowledges the fact that the case does not explicitly refer to the term "fair dealing" but argues that it is perhaps "merely a matter of historical fortuity that today the defence concept under discussion [*i.e.*, fair dealing] has not become known as a doctrine of 'fair do-es' or 'fair adoption.'"[216] The term "fair dealing" did not appear in an English judicial opinion until the British Parliament codified it in 1911.[217]

Countries such as the United Kingdom,[218] Canada,[219] Australia,[220] and India[221] are the primary flagbearers of the fair dealing doctrine. The doctrine denotes certain acts as laid down under the statute, the commission of which do not attract any liability despite being covered within the scope of copyright infringement.[222] In contrast with the fair use approach, fair dealing is limited to the purposes explicitly listed in the relevant copyright statute. The exception assumes applicability when affirmative answers are returned for two questions: (1) is the use for one of the listed purposes; (2) if yes, is the use fair, considering the fairness factors.[223] Courts have been very liberal in interpreting the contours of the first question, *i.e.*, the purposes

[213] Copyright Act 1911, 1 & 2 Geo. 5 c. 46, § 2(1)(i) (Eng.).

[214] Cary v. Kearsley (1802) 170 Eng. Rep. 679 (K.B.); David Bradshaw, *"Fair Dealing" as a Defence to Copyright Infringement in UK Law: An Historical Excursion from 1802 to the* Clockwork Orange Case *1993*, 10 DENNING L.J. 67, 68 (1995).

[215] *Cary*, 70 Eng. Rep. at 680.

[216] Bradshaw, *supra* note 214, at 69.

[217] *Id.* at 71.

[218] Copyright, Designs and Patents Act 1988, c. 48, §§ 29-30A (Eng.).

[219] Copyright Act, R.S.C. 1985, c. C-42, §§ 29-29.2 (Can.).

[220] *Copyright Act 1968* (Cth) ss 40-42 (Austl.).

[221] Copyright Act, 1957, § 52 (India).

[222] Narayan Prasad & Pravesh Aggarwal, *Facilitating Educational Needs in Digital Era: Adequacy of Fair Dealing Provisions of Indian Copyright Act in Question*, 18 J. WORLD INTELL. PROP. 150, 152 (2015).

[223] *Id.*

listed in the statutory text.[224] Therefore, the first hurdle is cleared with relative ease.[225]

The fair dealing doctrine found relevance in Indian colonial copyright law as far back as 1842. In *McMillan v. Khan Bahadur Shamsul Ulama Zaka*, the Bombay High Court held that the English law on copyright would be applicable in India.[226] With the passage of the Copyright Act of 1914, the fair dealing doctrine was statutorily introduced into Indian copyright legislation.[227]

Presently, Section 52 of the post-colonial Copyright Act of 1957 shapes India's exceptions and limitations to copyright infringement as affirmative defences. These defences can be divided into[228] fair dealing of works,[229] permitted reproductions,[230] permitted publications,[231] permitted performances and recitations,[232] exceptions with respect to sound recordings and cinematograph film,[233] exceptions for library use,[234] permitted uses of artistic works,[235] reconstruction of works of architecture,[236] permitted uses of computer and computer programmes,[237] permitted broadcasting,[238] permitted uses for persons with disabilities,[239] and permitted importation of goods.[240] For the scope of the present Paper, the most important of these classifications is the "fair dealing of works," which provides that fair dealing of any work for "private or personal use, including research," shall not accrue any liability for copyright infringement.[241] Before interpreting the scope of this limitation, it is important to understand what constitutes "fair dealing."

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[224] LIONEL BENTLY & BRAD SHERMAN, INTELLECTUAL PROPERTY LAW 203 (3d ed. 2009).
[225] *Id.*
[226] McMillan v. Khan Bahadur Shamsul Ulama Zaka, (1895) ILR Bom 557.
[227] Copyright Act, 1914, § 2(1)(i) (India).
[228] *See* ALKA CHAWLA, LAW OF COPYRIGHT: COMPARATIVE PERSPECTIVES (2013).
[229] Copyright Act, 1957, § 52(1)(a) (India).
[230] *Id.* at § 52(1)(e), (f), (i), (m), (p), (q).
[231] *Id.* at § 52(1)(h), (r), (s), (t).
[232] *Id.* at § 52(1)(j), (za).
[233] *Id.* at § 52(1)(k), (u), (y).
[234] *Id.* at § 52(1)(n), (o).
[235] *Id.* at § 52(1)(v), (w).
[236] *Id.* at § 52(1)(x).
[237] *Id.* at § 52(1)(aa), (ab), (ac), (ad), (b), (c).
[238] *Id.* at § 52(1)(z).
[239] *Id.* at § 52(1)(zb).
[240] *Id.* at § 52(1)(zc).
[241] *Id.* at § 52(1)(a)(i).

In terms of defining what constitutes fair dealing, a single-judge bench of the Delhi High Court in 2012 held that it is "neither possible nor advisable" to define the precise limits of fair dealing.[242] The adjudication is essentially a question of degree and cannot be the subject of absolute determination.[243] Further, the latitude of interpretation available in the Indian iteration of the fair dealing doctrine is far more than the limits placed by the United Kingdom's fair dealing doctrine.[244] Partial credit for such latitude can be given to the Indian courts' reliance on the four-factor fair use test, as applicable in American jurisprudence.[245]

There are two judgements from the Delhi High Court—*ICC Development v. New Delhi Television*[246] and the *Rameshwari Photocopy* case[247]—which are of primary significance when dealing with the relevance of the four-factor test in a fair dealing assessment within the Copyright Act of 1957. In 2012, *ICC Development* opined that the court would need to consider length, context and purpose, and commercial impact—closely mirroring the four-factor test enshrined in Section 107 of the American Copyright Act—to determine fair dealing within Section 52(1)(a) of the Indian Copyright Act.[248] Clarifying in 2016, Justice Pradeep Nandrajog, while deciding *Rameshwari Photocopy*, opined that the four-factor test is essential for the import of Section 52(1)(a) as far as the fair dealing assessment is concerned; however, the rest of the provisions, which enumerate other permitted acts,[249] cannot be held to the strict standard of the four-factor test and are only subject to a general idea of fairness.[250]

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[242] ICC Dev. Int'l Ltd. v. New Delhi Television Ltd., 193 (2012) DLT 279 (citing Super Cassettes Indus. Ltd. v. Hamar Television Network Priv. Ltd., (2011) 45 PTC 70 (Del.)).

[243] Hubbard v. Vosper, (1972) 2 Q.B. 84 (as cited in Super Cassettes Indus. Ltd. v. Hamar Television Network Priv. Ltd., (2011) 45 PTC 70 (Del.)).

[244] HARBIR SINGH, ANANTH PADMANABHAN & EZEKIEL J. EMANUEL, INDIA AS A PIONEER OF INNOVATION 134 (2017) ("Indian courts have come to treat [fair use and fair dealing] as interchangeable, disregarding the traditional dichotomy which English law had relied on and which continues to influence the approach of English courts to this day.").

[245] Chancellor Masters & Scholars of Univ. of Oxford v. Narendera Publishing House, 38 (2008) PTC 385; Syndicate of the Press of Univ. of Cambridge v. B.D. Bhandari, 185 (2011) DLT 346 (DB).

[246] *ICC*, 193 (2012) DLT at 279.

[247] Chancellor, Masters & Scholars of Univ. of Oxford v. Rameshwari Photocopy Servs., (2017) 69 PTC 123 (Del.).

[248] *ICC*, 193 (2012) DLT at 279.

[249] *E.g.*, Copyright Act, 1957, § 52(1)(h) (India).

[250] *Rameshwari*, 69 (2017) PTC at 123; *see also* Anupriya Dhonchak, *Can User Rights Under Section 52 of the Indian Copyright Act Be Contractually Waived?*, 13 NALSAR STUDENT L. REV. 117, 121-22 (2019).

Over the years, the courts have developed guidelines that explain the general idea of fairness. Some of these guidelines are:

1. If the defendant's secondary use infringes the copyright in the original work for commercial gains, the defence of fair dealing is not available, even if the secondary use is for research or private study.[251] However, the "commercial use of copyrighted work cannot simplicit[e]r make it unfair."[252]

2. Section 52 of Copyright Act, 1957, does not negatively prescribe what is infringement. The section seeks to promote "private study, criticism or review or reporting of current events."[253]

3. When discerning whether the secondary use constitutes a fair use of copyrighted work, the standard employed should be that of a "fair minded" and "honest person."[254]

4. In some circumstances, the public interest may be so overwhelming that courts would sometimes refrain from injuncting the verbatim use of a copyrighted work to convey a message to the public at large.[255]

5. Public interest and the interests of the public need not be the same.[256]

6. Multiple factors, including the purpose of creation, the purpose of use, and the intended commercial exploitation are all relevant for the adjudication of fair dealing.[257]

Given that there are two alternative models of incorporating limitations and exceptions (L&Es) in copyright statutes, the manner and scope in which national statutes incorporate L&Es are very different. While fair dealing is arguably a more restrictive approach where protection is available only when the secondary use is for one of the listed purposes in a copyright statute, fair use provisions incorporate broad considerations that determine the applicability of the exception. However, even the fair use provision explicitly lists some exemplary purposes for which the exception

[251] Rupendra Kashyap v. Jiwan Publ'g House, (1996) 38 DRJ 81.
[252] Super Cassettes Indus. Ltd. v. Mr. Chintamani Rao, (2012) 49 PTC 1 (Del.).
[253] Wiley Eastern Ltd. v. Indian Inst. of Mgmt., 61 (1996) DLT 281.
[254] Super Cassettes Indus. Ltd. v. Hamar Television Network Priv. Ltd., (2011) 45 PTC 70 (Del.).
[255] *Super Cassettes*, (2012) 49 PTC at 1.
[256] *Id.*
[257] ESPN Star Sports v. Glob. Broad. News Ltd., (2008) 38 PTC 477 (Del.).

has been designed.[258] One such purpose which appears in both fair use and fair dealing provisions is "research." The following Part seeks to determine parameters for the right to research, its constitutional justifications, and studies it as a copyright law exemption across various domestic copyright legislations.

B. Right to Research: Constitutional Justification and Exception to Copyright Law

Research has been available as an exception to English copyright law since 1956. Section 6 of the U.K. Copyright Act of 1956 exempted fair dealing with a literary, dramatic, or musical work for research and private study from the scope of infringement.[259] In 1983, Justice David Herbert Mervyn Davies opined that fair dealing with any copyrighted work for research or private study would not constitute infringement.[260] In 2003, the Copyright and Related Rights Regulations limited the research exception of English copyright law to non-commercial purposes.[261] In its present iteration, the U.K. Copyright, Designs and Patents Act of 1988 excuses "[f]air dealing with a work for the purposes of research for a non-commercial purpose . . . provided that it is accompanied with sufficient acknowledgement."[262]

The High Court of England in 2007 provided some guidelines for differentiating between commercial and non-commercial research. In *Controller of Her Majesty's Stationery Office v. Green Amps Ltd.*, the defendants gained unlicensed access to a mapping database made available only to universities and public research communities.[263] The Court ruled that if the defendants' ultimate use of the research has commercial value, it will lose the protection provided within Section 29 of the Act of 1988, which embodies the U.K. fair dealing doctrine.[264]

In short, motivation determines whether research is commercial or not. Given the insistence on the purpose of the research, there can be situations where private research organisations generate non-commercial research while a public university's research may be considered commercial.[265] Similarly, an academic's research for

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[258] *See* 17 U.S.C. § 107 (listing "purposes such as criticism, comment, news reporting, teaching . . . , scholarship, or research" as examples of non-infringing fair use).

[259] Copyright Act 1956, 4 & 5 Eliz. 2 c. 74, § 6 (Eng.).

[260] Sillitoe v. McGraw-Hill Book Co. (U.K.) [1983] F.S.R. 545 (EWHC (Ch)) at 558 (Eng.).

[261] The Copyright and Related Rights Regulations 2003, SI 2003/2498, art. 9(a) (Eng.).

[262] Copyright, Designs and Patents Act, 1988, c. 48, § 29(1) (Eng.).

[263] Controller of Her Majesty's Stationery Office v. Green Amps Ltd. [2007] EWHC (Ch) 2755 [7]-[8] (Eng.); *see also* Estelle Derclaye, *Of Maps, Crown Copyright, Research and the Environment*, 30 EUR. INTELL. PROP. REV. 162, 162 (2008) (summarizing the facts of the case).

[264] *Green Amps*, [2007] EWHC (Ch) 2755 [21] (Eng.); Derclaye, *supra* note 263, at 162 (summarizing the court's reasoning rejecting the defendant's fair dealing defence).

[265] BENTLY & SHERMAN, *supra* note 224, at 207-08.

publishing a book may be commercial and can lose the protection of the fair dealing doctrine.[266]

The distinction between commercial and non-commercial research is far from clear. For example, a researcher may eventually publish academic research as a book, but at which point in its lifecycle would such research become commercial? Further, there potentially can be a difference between commercial and *for-profit* research. Lack of judicial and academic opinion on the issue means that the distinction will largely be decided on a case-by-case basis.[267]

Other countries have also witnessed litigation for determining the scope of the right to research as a copyright law exception. For example, in *CCH Canadian v. Law Society of Upper Canada*,[268] the Supreme Court of Canada gave a very broad reading to Canadian copyright law's research and private study exception.[269] The Law Society of Canada operated a Great Library in Ontario, which offered a not-for-profit photocopying service to its members. Referring to the service provided by the library, publishers initiated copyright infringement proceedings against the Law Society.

Similar to English copyright law, Canadian law also provides an exemption for research from the scope of copyright infringement.[270] Interpreting the scope of this exemption, the Canadian Supreme Court admitted that the library's activities were largely commercial in nature. However, the Court stated, "research for the purpose of advising clients, giving opinions, arguing cases, preparing briefs and factums is nonetheless research."[271] The term "research" was interpreted very liberally to ensure that users' rights were not "unduly constrained" or "limited to non-commercial or private contexts."[272]

In Germany, the copyright law provides that up to 15% of a work can be reproduced, distributed, or made available either to "a specifically limited circle of persons for their personal scientific research" or to others to monitor the quality of

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[266] Derclaye, *supra* note 263, at 163.

[267] BRIT. ACAD. & PUBLISHERS ASS'N, JOINT GUIDELINES ON COPYRIGHT AND ACADEMIC RESEARCH: GUIDELINES FOR RESEARCHERS AND PUBLISHERS IN THE HUMANITIES AND SOCIAL SCIENCES 17-20 (2008), https://www.thebritishacademy.ac.uk/documents/1026/Guidelines_on_Copyright-2008.pdf.

[268] CCH Canadian Ltd. v. Law Soc'y of Upper Can., [2004] 1 S.C.R. 339 (Can.).

[269] Copyright Act, R.S.C. 1985, c. C-42, § 29 (Can.).

[270] *Id.*

[271] *CCH Canadian*, [2004] 1 S.C.R. at para. 51 (internal citations omitted).

[272] *Id.*

scientific research.[273] Scientific researchers can also reproduce up to 75% of a work for personal scientific research.[274] The Delhi High Court explicitly omitted such quantitative restrictions with the Indian fair dealing doctrine. The Court opined that quantitative and qualitative restrictions are of no concern to a fair dealing assessment.[275] German copyright law also permits text and data mining under specific conditions.[276] This exception was pioneered by Japan in 2009[277] and has since been adopted by the United Kingdom,[278] France,[279] and the EU. The EU law on the subject is governed by the Directive on Copyright in the Digital Single Market, adopted in 2019. The Directive provides two exceptions: one is unconditional and allows text and data mining for not-for-profit research;[280] the second promotes text and data mining for commercial purposes, subject to certain exceptions.[281]

Turning to Indian law, the Indian Copyright Act creates a categorical exception for research. Any person can escape the incidence of copyright infringement liability during their research or private study if he deals with the copyrighted material fairly.[282] Section 52(1)(a)(i) of the Copyright Act of 1957, as amended, presently reads as follows:

> 52.(1) The following acts shall not constitute an infringement of copyright, namely, (a) a fair dealing with any work, not being a computer programme, for the purposes of (i) private or personal use, including research . . . .[283]

The present iteration of the provision results from a substantial amendment from the Copyright (Amendment) Act of 2012, which substituted the original term "research

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[273] Urheberrechtsgesetz – UrhG [Act on Copyright and Related Rights], Sept. 9, 1965, BGBl. I, § 60c(1) (Ger.).

[274] *Id.* § 60c(2).

[275] Chancellor, Masters & Scholars of Univ. of Oxford v. Rameshwari Photocopy Servs., (2017) 69 PTC 123 (Del.).

[276] BGBl. I, § 60d (Ger.).

[277] PAUL GOLDSTEIN & P. BERNT HUGENHOLTZ, INTERNATIONAL COPYRIGHT: PRINCIPLES, LAW, AND PRACTICE 358 (4th ed. 2019).

[278] Copyright, Designs and Patents Act 1988, c. 48, § 29A (Eng.), as amended by The Copyright and Rights in Performances (Research, Education, Libraries and Archives) Regulations 2014, SI 2014/1372 (Eng.).

[279] Intellectual Property Code, art. L. 122-5 (10) (Fr.).

[280] Council Directive 2019/790, art. 3, 2019 O.J. (L 130) (EU).

[281] *Id.* at art. 4.

[282] Rupendra Kashyap v. Jiwan Publ'g House, (1996) 16 PTC 439 (Del.) (finding that the defendant acted improperly and unfairly by violating the plaintiff's exclusive license to print exams).

[283] Copyright Act, 1957, § 52(1)(a)(i) (India).

or private study" with "private or personal use, including research."[284] The 2012 amendment and the use of the term "including" raise a pertinent question: Is commercial and for-profit research protected within the Indian fair dealing doctrine?

In India, it is an established principle of statutory interpretation that the use of the term "includes" in an interpretation clause extends the scope of the definition.[285] Using the term "includes" in statutory language often signifies the legislature's intent to "enlarge the meaning of the words and phrases occurring in the body of the statute."[286] In the case of *S.M James*, the Patna High Court pointed out that the word "including" is a term of extension and adds to the subject matter already comprised within the definition.[287] In 2009, the Supreme Court of India clarified that inclusive definitions are used:

> (1) to enlarge the meaning of words or phrases so as to take in the ordinary, popular and natural sense of the words and also the sense which the statute wishes to attribute to it; (2) to include meaning about which there might be some dispute; (3) to bring under one nomenclature all transactions possessing certain similar features but going under different names.[288]

Apart from the established meaning of inclusive definitions, there are constitutional justifications for providing a broad interpretation of Section 52(1)(a)(i). The exception can be interpreted as a statutory recognition of the right to research. Despite the lack of explicit legislative recognition, the right to research arguably has a constitutional basis. The freedom of speech and expression and the right to life and personal liberty, enshrined respectively in Article 19(1)(a) and Article 21 of the Constitution of India, can be interpreted to encompass a right to research.[289]

In 1966, a full bench of the Delhi High Court expanded the scope of Article 21 to include "a right to acquire useful knowledge," which, in the opinion of the Court, was "necessary to the orderly pursuit of happiness by free man."[290] The Supreme Court of India in 1980 opined that the ambit of Article 21 includes the

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[284] Copyright (Amendment) Act, 2012, § 38 (India).

[285] GURU PRASANNA SINGH, PRINCIPLES OF STATUTORY INTERPRETATION 72-77 (A.K. Patnaik ed., 14th ed. 2016).

[286] *Id.* at 161.

[287] S.M. James v. Dr. Abdul Khair, AIR 1961 Pat 242.

[288] Karnataka Power Transmission Corp. v. Ashok Iron Works Priv. Ltd., (2009) 3 SCC 240.

[289] India Const. art. 19, cl. 1(a).

[290] Rabinder Nath Malik v. Reg'l Passport Officer New Delhi, AIR 1967 Del 1.

provision for facilities of "reading, writing and expressing oneself in diverse forms."[291] Again in 1997, the Supreme Court of India included "social, cultural and intellectual" fulfilments as a part of the right to life.[292] Such a broad conception of Article 21 would include knowledge acquisition by scientists, academics, and researchers and could therefore be understood to harbour the constitutional protection of a "right to research."

This interpretation is consistent with the opinion of Professor John A. Robertson, who argued that a broad conception of the term liberty, as used in the 14th Amendment of the American Constitution, could incorporate a right to research.[293] In making the argument, Robertson relied on the United States Supreme Court's decision in *Meyer v. Nebraska* where "liberty" was held to include "the right . . . to acquire useful knowledge."[294]

Further, in *Wiley v. Indian Institute of Management*, the Delhi High Court held that the purpose of Section 52 of the Copyright Act of 1957 is to protect the freedom of speech and expression, which is guaranteed by Article 19(1)(a) of the Constitution of India.[295] Hence, both the established interpretation of inclusive definitions and the constitutional basis of the right to research require courts to interpret Section 52(1)(a)(i) in its broadest possible enunciation. Therefore, a liberal interpretation of the fair dealing exception can protect both commercial and non-commercial research within the Indian context.

Having identified the guiding principles for the determination of fair dealing in Indian copyright law, the following Part aims to understand the judicial appreciation of these principles. The next Part discusses two judgements where the Delhi High Court recognised the overwhelming needs of higher education and purposively interpreted copyright law.

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[291] Frances Coralie Mullin v. Adm'r, Union Territory of Delhi, AIR 1981 SC 746.

[292] Samatha v. State of Andhra Pradesh (1997) 8 SCC 191.

[293] John A. Robertson, *The Scientist's Rights to Research: A Constitutional Analysis*, 51 S. CAL. L. REV. 1203, 1212 (1978).

[294] Meyer v. Nebraska, 262 U.S. 390, 399 (1923).

[295] Wiley Eastern Ltd. v. Indian Inst. of Mgmt., 61 (1996) DLT 281.

IV
RAMESHWARI PHOTOCOPY CASE AND A NORMATIVE READING OF FAIR DEALING EXCEPTIONS

The *Rameshwari Photocopy* case is arguably one of the most important judicial decisions of the Indian copyright jurisprudence.[296] Five publishers—namely Oxford University Press; Cambridge University Press, United Kingdom; Cambridge University Press, India Pvt. Ltd.; Taylor and Francis Group, U.K.; and Taylor and Francis Books India—sued Delhi University, a major public university, and Rameshwari Photocopy, a photocopy service provider within the campus, for copyright infringement. Support poured in favour of the defendants, with students across the country taking to the streets, demonstrating and conducting "acts of civil disobedience targeted at the publishers."[297] Dr. Amartya Sen wrote a letter to the publishers expressing his distress at the plaintiffs' actions.[298] Professor Satish Deshpande successfully articulated the stakeholders' concerns when he argued that "quality higher education is not compatible with an overzealous copyright law."[299]

Delhi University had authorised a photocopy shop on the university campus to prepare and distribute course packs. These course packs were designed based on the course curriculum prescribed by the university faculty and contained extracts from the plaintiffs' copyrighted works. Five publishers initiated copyright infringement proceedings against the university and the photocopy service provider to restrain them from reproducing and distributing the copies of the publishers' works and selling course packs. The plaintiffs claimed that Delhi University had "institutionalised infringement by prescribing chapters from the publications of the plaintiffs as part of its curriculum / syllabus and permitting photocopy of the said chapters and sale thereof as course packs."[300] The defendants sought protection under Section 52(1)(i) of the Copyright Act of 1957, which protects the reproduction of a copyrighted work by a teacher or a pupil "in the course of instruction."[301]

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[296] Lawrence Liang, *Paternal and Defiant Access: Copyright and the Politics of Access to Knowledge in the Delhi University Photocopy Case*, 1 INDIAN L. REV. 36, 50 (2017).

[297] *Id.* at 37-38.

[298] Amlan Mohanty, *Authors, Academics and Students Protest Publishers' Move in Delhi University Copyright Case*, SPICYIP (Sept. 19, 2012), https://spicyip.com/2012/09/authors-academics-and-students-protest.html.

[299] Satish Deshpande, *Copy-Wrongs and the Invisible Subsidy*, INDIAN EXPRESS (Oct. 7 2016, 5:04 AM), https://indianexpress.com/article/opinion/columns/delhi-high-court-judgement-banning-order-photocopy-extracts-of-books-and-journals-3069347/.

[300] Chancellor, Masters & Scholars of Univ. of Oxford v. Rameshwari Photocopy Servs., (2017) 69 PTC 123 (Del.).

[301] *Id.*

In September 2016, a single-judge bench of the Delhi High Court ruled in favour of the defendants and opined that Section 52(1)(i) protected the defendants' actions.[302] Justice Rajiv Sahai Endlaw relied on the structural logic underlying the Copyright Act.[303] He held that the permitted uses of a copyrighted work mentioned in Section 52 should not be interpreted as exceptions to the copyright monopoly. Rather, these acts were never a part of the copyright bargain and were never granted to the author of a copyrightable work.[304] The legislature has drafted the contents of Section 52 to be outside the scope of infringement. Interpreting this, the Court expanded the ambit of Section 52 from mere limitations and exceptions to users' rights. Thus, the Court dismissed the petition because no question of copyright infringement arose in the present case.

The plaintiffs appealed against the single judge's decision before a Division Bench of the Delhi High Court, which delivered its judgement in December of 2016.[305] The publishers contended that the Court must employ the four-factor test for determining the scope of Section 52(1)(i). Given the last two factors of the four-factor test require the quantum and the impact of the secondary use on the potential market to be taken into account, the plaintiffs' insistence on transplanting the test into Indian law is self-explanatory. Neither the single judge nor the Division Bench agreed.[306] The Division Bench held that whenever somebody else utilises a person's result of labour, "fair use must be read into the statute."[307] However, since the legislature, while permitting reproduction during the course of instruction, had not created an express limitation of fair use, only a "general principle of fair use would be required to be read into the clause," and not the four-factor test.[308] Thus, the general principle of fairness applied as long as the secondary use was justified for education. The Division Bench explicitly held that no qualitative or quantitative threshold on secondary copying could be read into the statute.[309]

The publisher appellants had argued that the respondents' manner of using the copyrighted material would adversely affect the appellant's potential market. The Court replied negatively. The Court asserted that the reproduction of an entire work as part of a literacy programme does not affect the potential market of the publisher as the beneficiaries of the literacy programme are not potential customers, reasoning

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[302] *Id.*
[303] Liang, *supra* note 296, at 42.
[304] *Rameshwari Photocopy*, (2017) 69 PTC 123.
[305] *Id.*
[306] *Id.*
[307] *Id.*
[308] *Id.*
[309] *Id.*

that students were not potential customers for some forty reference books: if course packs are not available, students would simply use the library. The Court eventually held that "[i]t could well be argued that by producing more citizens with greater literacy and earning potential, in the long run, improved education expands the market for copyrighted materials."[310]

The Court then turned to the interpretation of the phrase "in the course of instruction" from Section 52(1)(i) of the Copyright Act of 1957.[311] The appellants had favoured a restrictive interpretation of the phrase; in their opinion, the phrase was limited to direct, face-to-face interaction between the teacher and the student. Interpreting the phrase, the Court opined that using the word "course" meant that the protection covers the entire process of education in a semester. Interpreting the phrase to give an expansive interpretation to the term "instruction" was possibly the most important part of the two judgements. The Division Bench relied on a judgement from the High Court of New Zealand to come to this conclusion.[312]

When the appellants argued that the photocopy service provider acted as an intermediary, which cannot be protected, the Court opined that the argument concerning the use of an agency was irrelevant. The "core of the activity," the Division Bench elaborated, was photocopying to impart education. It was irrelevant as to what the arrangement was between the teacher and the pupil.[313]

The Division Bench eventually remanded the issue to the Court of Justice Endlaw for a fact-specific determination of whether (1) the course packs were necessary for instructional use by teachers, and (2) complete photocopies of books found on the photocopy service provider's premises were permissible.[314] At this stage, the publishers decided not to prefer an appeal to the Supreme Court and withdrew the suit.[315] Three publishers published a joint statement where they

[310] *Id.*

[311] *Id.*

[312] *Id.* (citing *Longman Group Ltd v Carrington Technical Institute Board of Governors* [1991] 2 NZLR 574).

[313] *Id.*

[314] *Id.*

[315] Order dated March 10, 2017, *Rameshwari Photocopy*, (2017) 69 PTC 123 (CS(OS) 2439/2012 IA No. 3154/2017), http://delhihighcourt.nic.in/dhcqrydisp_o.asp?pn=50568&yr=2017.

acknowledged the importance of the course packs and decided to work with the stakeholders involved to understand and address their needs.[316]

V
RETAIN THE NORMATIVE READING OF COPYRIGHT LAW: SCI-HUB AS FAIR DEALING IN INDIAN COPYRIGHT LAW

In 2017, Professor Lawrence Liang speculated that the pirate OA movement for academic articles would soon be subjected to judicial scrutiny. He believed that if the *Rameshwari Photocopy* judgements could be appreciated as examples of "how the law can and indeed must respond to the real-world challenges of access to learning materials," then their precedential relevance would be interesting when piracy of academic literature was adjudged on the pedestal of copyright law.[317]

In December 2020, three academic publishers—Elsevier, Wiley, and American Chemical Society—appeared before the commercial jurisdiction of the Delhi High Court and sued Elbakyan and Libgen for copyright infringement.[318] When the case first came before the Delhi High Court, Justice Rajiv Shakdher directed the defendants not to upload any article, the copyright to which remained with the plaintiffs.[319] Similar to the *Rameshwari Photocopy* case, this infuriated a large segment of the academic community. With multiple blog articles[320] and opinion pieces[321] published regularly, the issue became the subject of national academic and editorial comments.

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[316] Joint Statement, Oxford University Press, Cambridge University Press and Taylor & Francis (March 9, 2017), http://fdslive.oup.com/asiaed/News%20Items%20and%20Images/Joint%20Public%20Statement.pdf.

[317] Liang, *supra* note 296, at 52.

[318] Elsevier Ltd. v. Elbakyan, CS(COMM) 572/2020, decided on Dec. 24, 2020 (Del.).

[319] *Id.*

[320] Arunabh Saikia, *Why Indian Researchers Oppose Efforts to Have a Pirate Website Banned*, SCROLL.IN (Dec. 24, 2020, 6:30 AM), https://scroll.in/article/982146/push-to-ban-sci-hub-pirate-website-will-blunt-indian-research-projects-warn-academics; Nitin Pai, *Why Blocking Sci-Hub Will Actually Hurt National Interest*, THEPRINT (Dec. 29, 2020, 11:04 AM), https://theprint.in/opinion/why-blocking-sci-hub-will-hurt-national-interest/575577/; Prabir Purkayastha, *Elsevier and Wiley Declare War on Research Community in India*, LEAFLET (Dec. 28, 2020), https://www.theleaflet.in/elsevier-and-wiley-declare-war-on-research-community-in-india/.

[321] Arul George Scaria, *Sci-Hub Case: The Court Should Protect Science from Greedy Academic Publishers*, WIRE (Dec. 22, 2020), https://thewire.in/law/sci-hub-elsevier-delhi-high-court-access-medical-literature-scientific-publishing-access-inequity; Rahul Siddharthan, *An Anti-Science Lawsuit*, HINDU (Dec. 24, 2020, 5:06 PM), https://www.thehindu.com/opinion/op-ed/an-anti-science-lawsuit/article33405250.ece.

Soon enough, 19 academics and 3 organisations approached the Delhi High Court to intervene in the case. On January 6, 2021, Justice J.R. Midha admitted that the litigation in the case was an "issue of public importance" and allowed the parties to submit their intervention applications.[322] At the time of drafting this Paper (August 2021), the case is *sub-judice* before the Delhi High Court and detailed arguments remain to be heard from both sides. The Sci-Hub litigation and the *Rameshwari Photocopy* case bear many similarities. Both cases align with the larger Access to Knowledge movement and further the cause of higher education and academic research. Therefore, the purposive interpretation of copyright law—as was favoured in the *Rameshwari Photocopy* case—may considerably impact the Sci-Hub litigation.

The publishers' primary argument is that they hold the exclusive right to reproduce, issue copies for the public, and communicate the concerned work to the public.[323] Since the defendants have made the plaintiffs' copyrighted works available on their website without due authorisation, they are liable for copyright infringement.

Given the structure within which Sci-Hub operates, it would not be difficult for the plaintiffs to establish copyright infringement within the terms of Section 51 of the Copyright Act of 1957. The primary contention in the Sci-Hub case would be the interpretation of Section 52(1)(a) of the Copyright Act of 1957.[324] As elaborated in Part III.A.2, for the application of the fair dealing doctrine, a court has to appreciate two questions: (1) is the use for one of the listed purposes; (2) if yes, is the use fair, considering the fairness factors. Both of these questions are discussed in detail below.

A. Does Sci-Hub Support and Facilitate Research?

An important question in this case is to test whether the activities of Sci-Hub facilitate research and, in doing so, fall within the purview of the fair dealing exception.[325] Section 52(1)(a)(i) of the current Indian copyright law includes:

> (a) a fair dealing with any work, not being a computer programme *for the purposes of:* (i) Private or personal use, including research . . . .

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[322] Elsevier Ltd. v. Elbakyan, CS(COMM) 572/2020, decided on Jan. 6, 2020 (Delhi High Court).

[323] These rights are accorded to the publishers via a conjoint reading of Section 14 and Section 51 of the Copyright Act of 1957.

[324] Vandana Mahalwar, *On Copyright Protection*, 56 ECON. & POL. WKLY. 4, 5 (2021).

[325] *Id.*

Part III.B of the present Paper has elaborated on the possible import of Section 52(1)(a)(i). This Part of the Paper seeks to investigate which activities would be protected by the use of the phrase "for the purposes of research" and examines if the provision covers the activities of Sci-Hub.

Interpreting Section 52(1)(a)(i), the Court could take a restrictive approach and limit the exception's applicability to only the person engaged in the research. Such a construction could prove to be fatal for the Sci-Hub litigation. Alternatively, the Court could liberally interpret the provision and extend the protection offered by the exception to third parties, the activities of whom *facilitate* research.

The decision of the Supreme Court of India in *CGT v. P. Gheevarghese*[326] provides support for a liberal interpretation. In the *Gheevarghese* case, an income tax assessee claimed an exemption from paying gift tax under Section 5(1)(xiv) of the Indian Gift Tax Act of 1958[327] which provides:

> 5 (1) Gift Tax shall not be charged under this Act in respect of gifts made by any person . . . (xiv) in the course of carrying on a business, profession or vocation, to the extent to which the gift is proved to the satisfaction of the Gift Tax Officer to have been made bona fide *for the purpose of* such business, profession or vocation.

In determining whether the exemption claimed by the assessee was valid, the Supreme Court had to understand the import of the term "for the purpose of." In doing so, the Court relied on Webster's New International Dictionary's definition: "[I]t is that which one sets before himself as an object to be attained; the end or aim to be kept in view of any plan, measure, exertion or operation."[328] The Court opined that the plan or design for being covered by the relevant provision must have a relationship or connection with the business. In other words, as long as the object of making the gift was related to the business, the protection provided under Section 5(1)(xiv) of the Gift Tax Act of 1958 should be applicable.

If the Supreme Court's view is applied to the Sci-Hub litigation, use of the phrase "for the purpose of" in Section 52(1)(a)(i) will assume applicability as long as the impugned activity has a relationship with research. As long as the object of secondary use is related to research, the fair dealing provision should assume relevance.

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[326] CGT v. P. Gheevarghese, Travancore Timbers and Products, (1972) 4 SCC 323 (India).
[327] The Act has subsequently been repealed with effect from October 1998.
[328] *Gheevarghese,* (1972) 4 SCC 323.

A second argument favouring a liberal interpretation is that Sci-Hub's activities are in consonance with the fundamental reason fair dealing has been included in copyright law. Copyright law, in itself, is premised on the promotion of creativity. The copyright bargain grants a statutory monopoly limited by various L&Es, which recognise the competing need to ensure that the law of copyright does not stifle the dissemination of information. The L&Es, coupled with a limited copyright term, guarantee "not only a public pool of ideas and information but also a vibrant public domain in expression, from which an individual can draw as well as replenish."[329] Courts can interpret L&Es to balance copyright holders' exclusive rights with the competing interest of enriching the public domain.[330]

As discussed in Part III.B, "the basic purpose of Section 52 is to protect the freedom of expression under Article 19(1) of the Constitution of India—so that research, private study and criticism or review or reporting of current events could be protected."[331] As far back as 1965, the Jammu and Kashmir High Court highlighted that "under the guise of a copyright the authors cannot ask the court to close all the doors of research and scholarship and all frontiers of human knowledge."[332] Courts can use such constitutional- and public-policy-based justifications to liberally and purposively interpret Section 52 and ensure that a purely statutory right (*i.e.*, copyright) does not stifle academic and scientific research.

The Supreme Court and the High Courts have not appreciated a similar argument in a factual matrix comparable to the Sci-Hub case. The only instance where Section 52(1)(a)(i) has been substantively interpreted by an Indian appellate court is the 1996 case of *Jiwan Publishing House*.[333] The plaintiff therein had an exclusive license from the Central Board of Secondary Education to publish and reproduce the past year's question papers for Class 10th and 12th. The defendants published the question papers for commercial exploitation. When sued for copyright infringement, amongst other defences, the defendants sought refuge under Section 52(1)(a)(i). The Court relied on the commercial aspect of the defendants' business to hold that "if a publisher publishes a book for commercial exploitation and in doing so infringes a copyright, the defence under Section 52(1)(a)(i) would not be available."[334] Justice Ramesh Chandra Lahoti's judgement in *Jiwam Publishing*

[329] Univ. of Cambridge v. B.D. Bhandari, (2011) 47 PTC 244 (Del.).
[330] *Id.*
[331] Wiley E. Ltd. v. Indian Inst. of Mgmt., 61 (1996) DLT 281.
[332] Romesh Chowdhry v. Kh Ali Mohamad Nowsheri, AIR 1965 J&K 101.
[333] Rupendra Kashyap v. Jiwan Publ'g House, (1996) 16 PTC 439 (Del.).
[334] *Id.*

heavily relies on the commercial aspect of the defendants' business,[335] which, as explained in the next Part, looks to be absent from Sci-Hub's business model.

B. Fairness of Secondary Use by Sci-Hub

As far as Section 52(1)(a) is concerned, as explained in Part III.A.2, fairness would be determined based on the four-factor test of fair use as incorporated in Section 107 of the American Copyright Act. This Part deals with each of the four factors and examines whether the use of academic literature by Sci-Hub satisfies the fair use scrutiny.

1. The Purpose and Character of the Infringing Use

On multiple occasions, Alexandra Elbakyan has communicated her altruistic motivations behind creating and managing Sci-Hub.[336] In February 2021, an Indian news agency, *The Wire*, published an interview with Elbakyan where she further underlined her motivations: "Sci-Hub's view is that science should not be controlled by a few big companies but it should be a dynamic network of learned societies."[337]

As understood, Sci-Hub does not intend to build an archive of the world's scholarly literature. Its primary motivation seems to be removing paywalls and providing free access to scientific literature.[338] This position is underlined by the fact that, in 2015, Sci-Hub deactivated the archiving of several journals that "exemplify openness."[339] Therefore, it may not be difficult to argue that the purpose of the secondary use by Sci-Hub is facilitating research and democratising the availability of academic scholarship.

The next question that needs to be addressed is whether Sci-Hub's business model is commercial. Sci-Hub primarily relies on donations and does not profit from the access it provides.[340] It does not charge its users for accessing research literature. Until 2013, Sci-Hub accepted donations over payment gateways such as PayPal. However, after Elsevier sent a publisher's notice to PayPal, PayPal deactivated

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[335] Super Cassettes Indus. Ltd. v. Hamar Television Network Priv. Ltd., (2011) 45 PTC 70 (Del.).

[336] Elbakyan & Bozkurt, *supra* note 155, at 113; Simon Oxenham, *Meet the Robin Hood of Science, Alexandra Elbakyan*, BIG THINK (Feb. 9, 2016), https://bigthink.com/neurobonkers/a-pirate-bay-for-science.

[337] Sidharth Singh, *An Interview With Sci-Hub's Alexandra Elbakyan on the Delhi HC Case*, WIRE (Feb. 22, 2021), https://science.thewire.in/the-sciences/interview-alexandra-elbakyan-sci-hub-elsevier-academic-publishing-open-access/.

[338] *Id.*

[339] Himmelstein et al., *supra* note 29, at 12.

[340] *Id.*

Elbakyan's account, and Sci-Hub turned to Bitcoin.[341] Research suggests that prior to 2018, Sci-Hub received over 1,232 donations totalling 94.494 bitcoins.[342] However, Sci-Hub may be accepting donations from unrevealed bitcoin addresses, so the overall value of donations could be much higher than the anticipated value estimated in the previous report.[343]

Irrespective of the donations received by Sci-Hub, it has been widely accepted that Sci-Hub does not generate any profits from its services.[344] Therefore, an argument can be made that Sci-Hub's activities qualify as non-commercial educational use. While it is difficult to argue that Sci-Hub's secondary use is transformative, judicial precedent nevertheless favours fair use in the case of non-commercial secondary use for educational and informational purposes.[345]

2. The Nature of the Copyrighted Work

The second factor for assessing fair use does not weigh in as significantly as the other three factors.[346] The second fair use factor requires a court to recognise that "some works are closer to the core of intended copyright protection than others, with the consequence that fair use is more difficult to establish when the former works are copied."[347] A court should assess the second factor based on "the originality and creativity of the work and its value to the public."[348] Examination of this factor becomes difficult as there are no bright-line rules for determining which end of the spectrum is occupied by academic and scholarly literature.[349]

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[341] *See* Ian Graber-Stiehl, *Science's Pirate Queen*, VERGE (Feb. 8, 2018, 9:00 AM), https://www.theverge.com/2018/2/8/16985666/alexandra-elbakyan-sci-hub-open-access-science-papers-lawsuit; Anna Baydakova, *Blackballed by PayPal, Scientific-Paper Pirate Takes Bitcoin Donations*, COINDESK (June 22, 2020), https://www.coindesk.com/markets/2020/06/22/blackballed-by-paypal-scientific-paper-pirate-takes-bitcoin-donations/.

[342] Himmelstein et al., *supra* note 29, at 12.

[343] *Id.*

[344] Malpani, *supra* note 100, at 171.

[345] *See, e.g.*, Cambridge Univ. Press v. Patton, 769 F.3d 1232, 1283 (11th Cir. 2014); Brandon Butler, *Transformative Teaching and Educational Fair Use After Georgia State*, 48 CONN. L. REV. 473, 509-14 (2015).

[346] 4 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT §13.05 (1st ed. 1963).

[347] Campbell v. Acuff-Rose Music, Inc., 510 U.S. 569, 586 (1994).

[348] *Cambridge*, 769 F.3d at 1289.

[349] *Compare* Princeton Univ. Press v. Mich. Document Servs., 99 F.3d 1381, 1389 (6th Cir. 1996) ("[T]he excerpts copied for the course packs contained creative material, or 'expression;' it was certainly not telephone book listings that the defendants were reproducing. This factor . . . cuts against a finding of fair use."), *with* Basic Books, Inc. v. Kinko's Graphics Corp., 758 F. Supp. 1522 (S.D.N.Y. 1991) ("The books infringed in suit were factual in nature. This factor weighs in

In the United States, the District Court for the Northern District of Georgia in *Cambridge University Press v. Becker* attempted to "rulify"[350] the fair use analysis. In reference to the second factor, the Court summarily held that certain books copied to create an electronic reserve were informational and factual rather than creative.[351] This attempt to "rulify" the fair use analysis was obstructed by the Eleventh Circuit Court of Appeals,[352] which disagreed and opined that without individual examination of the subject books, the Court could not make such a summary judgement.[353] The Court of Appeals held:

> [W]here the excerpts of Plaintiffs' works contained evaluative, analytical, or subjectively descriptive material that surpasses the bare facts necessary to communicate information, or derives from the author's experiences or opinions, the District Court should have held that the second factor was neutral, or even weighed against fair use in cases of excerpts that were dominated by such material.[354]

The Court of Appeals eventually remanded the case back to the District Court. After individual examination, the District Court opined that the scholarly books and literature only incorporated weak copyright.[355] A similar judgement can be traced back to 1992, where a court treated scholarly articles as factual, meaning they were further from the core of intended copyright protection, which favoured fair use.[356]

This route of individual examination poses a problem for the Sci-Hub case. If a summary ruling on the nature of Sci-Hub's database is not possible, an exercise by the Court to determine the nature of each of the 56,246,220 articles[357] may not be possible either.

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favor of defendant."). Thus, no bright-line rules can be accepted; this position has since been ratified by some courts. *See, e.g.*, *Cambridge*, 769 F.3d at 1269 (finding the second factor weighing neutrally for similar academic work).

[350] Rulification broadly means converting the flexible, case-specific deliberation "standards" to "rules" and adopting uniformity, predictability, and low decision costs at the expense of rigidity and inflexibility. *See generally* Michael Coenen, *Rules Against Rulification*, 124 YALE L.J. 644 (2014).

[351] Cambridge Univ. Press v. Becker, 863 F. Supp. 2d 1190, 1242 (N.D. Ga. 2012).

[352] For a detailed assessment of the Court's argument and its criticism, see Niva Elkin-Koren & Orit Afori, *Rulifying Fair Use*, 59 ARIZ. L. REV. 161, 186-99 (2017).

[353] Cambridge Univ. Press v. Patton*,* 769 F.3d 1232, 1270 (11th Cir. 2014).

[354] *Id.*

[355] *Becker*, 863 F. Supp. 2d at 1218.

[356] Am. Geophysical Union v. Texaco, Inc., 802 F. Supp. 1, 16 (S.D.N.Y. 1992), *aff'd*, 60 F.3d 913 (2d Cir. 1994). However, the Plaintiff prevailed based on other factors.

[357] Himmelstein et al., *supra* note 29, at 4.

Therefore, it is safe to argue that some bright-line rule shall have to be devised and espoused by the Court for determining the second factor. Such a bright-line rule should rely on judicial precedent, which argues that scholarly literature is more factual than creative, which may favour Sci-Hub in the present case. If such a bright-line approach is not favoured, the Court should declare that the factor is neutral, in which case the factor would not favour either party in the fair use analysis.

3. The Portion Used in Relation to the Copyrighted Work as a Whole

There is no denying that Sci-Hub, for its secondary use, has appropriated the entirety of the publishers' copyrighted material. However, such copying does not inevitably invite a copyright penalty.[358] Two American judicial controversies substantiate this position, both originating from a similar set of facts.[359]

The first controversy relates to the HathiTrust Digital Library. In 2004, a group of universities allowed Google to create digital copies of copyrighted books available in their libraries for public use. The universities came together to create HathiTrust, and the digital library was known as the HathiTrust Digital Library. The Trust permitted three uses of the copyrighted work: (1) full-text searchability of books, (2) access for people with certified print disabilities, and (3) preservation. When the Authors Guild sued the Trust, the District Court for the Southern District of New York and the Court of Appeals for the Second Circuit returned a finding of fair use.[360]

Authors Guild v. Google, Inc., the second controversy, involved the same secondary use, *i.e.*, creating a digital library. After delivering digital copies to partner libraries, Google created an electronic database, which allowed readers to view full texts of publicly available books and view snippets of copyrighted books. The database also allowed search functionality in the books. When sued by the plaintiffs, the District Court of the Southern District of New York and the Court of Appeals for

[358] Swatch Grp. Mgmt. Servs. v. Bloomberg LP, 756 F.3d 73 (2d Cir. 2014); Wendy J. Gordon, *The Fair Use Doctrine: Markets, Market Failure and Rights of Use*, *in* HANDBOOK ON THE ECONOMICS OF COPYRIGHT: A GUIDE FOR STUDENTS AND TEACHERS 82 (Richard Watt ed., 2014).

[359] *See* Matthew Rimmer, *The Foxfire of Fair Use: The Google Books Litigation and the Future of Copyright Laws*, *in* OXFORD RESEARCH ENCYCLOPEDIA OF COMMUNICATION (2017); Argyri Panezi, *The Role of Judges in Deciding the Future of Digital Libraries,* 17 GLOB. JURIST 20150025 (2017).

[360] Authors Guild, Inc. v. HathiTrust, 902 F. Supp. 2d 445 (S.D.N.Y. 2012), *aff'd in part*, 755 F.3d 87 (2d Cir. 2014).

the Second Circuit returned a finding of fair use favouring Google.[361] In April 2016, the Supreme Court of the United States denied certiorari.[362]

In both *HathiTrust* and *Google*, the hierarchy of judicial opinion discussed the public importance of the defendants' secondary use.[363] In both of the controversies, the courts returned a favourable finding of fair use despite a complete appropriation of copyrighted material.

The Authors of this Paper admit that the secondary uses in the two controversies were substantially different from the use of copyrighted material by Sci-Hub. However, what is important is that, when public interest dictates, a complete appropriation of the copyrighted material cannot be the singular yardstick to determine a fair use analysis. Therefore, if interpreted liberally, this factor may continue to remain neutral.

4. The Effect of the Use upon the Potential Market for or Value of the Copyrighted Work

Nimmer on Copyright argues that the analysis under the fourth factor essentially balances "the benefit the public will derive if the use is permitted and the personal gain the copyright owner will receive if the use is denied."[364] Public benefit compensates for the adverse monetary effect of a secondary use on a plaintiff's copyrighted material. In this analysis, the court should not be concerned with the impact of a defendant's work who has only copied the non-copyrightable factual material from the plaintiff's work.[365]

Both Justice Endlaw and the Division Bench of the Delhi High Court dealt with the implications of photocopying the plaintiff's copyrighted works on the potential market. Justice Endlaw argued that if photocopy services were not available, students would have to spend long hours in the library and make notes

[361] Authors Guild, Inc. v. Google, Inc., 954 F. Supp. 2d 282, 289 (S.D.N.Y. 2013), *aff'd*, 804 F.3d 202 (2d Cir. 2015).

[362] Authors Guild v. Google, Inc., 578 U.S. 941 (2016) (denying certiorari); *see also* Adam Liptak & Alexandra Alter, *Challenge to Google Books Is Declined by Supreme Court*, N.Y. TIMES (Apr. 18, 2016), https://www.nytimes.com/2016/04/19/technology/google-books-case.html; Panezi, *supra* note 359.

[363] Haochen Sun, *Copyright Law as an Engine of Public Interest*, 16 NW. J. TECH. & INTELL. PROP. 123, 127-130, 137-38 (2019).

[364] NIMMER & NIMMER, *supra* note 346, at § 13.05.

[365] *Id.* ("Only the impact of the use in defendant's work of material that is protected by plaintiff's copyright need be considered under this factor. Thus, a court need not take into account the adverse impact on the potential market for plaintiff's work by reason of defendant having copied from plaintiff noncopyrightable factual material.").

from the prescribed readings. He argued that "the students can never be expected to buy all the books, different portions whereof are prescribed as suggested reading and can never be said to be the potential customers of the plaintiffs."[366] The Division Bench observed that a student could not be a potential customer for the reference books or the suggested readings for a semester. For reference, a student would visit the library that houses the books rather than buying the books.[367]

In academic publishing, it is no secret that the primary consumers are academic libraries.[368] The business for academic journals is not predicated on sales to individual researchers.[369] A report published in 2018 concluded that personal subscriptions account for less than 3% of journal publishing revenues.[370]

The price of individual journal articles further supports this hypothesis. For example, in preparing the present Paper, the Authors used 176 journal articles and book chapters. Relying on statistics, 20% of the articles were available via OA.[371] Placing the price of each journal article/book chapter at a conservative $30, the Authors would have spent approximately $4,230 in preparing this research, which would translate to ₹313,492. Despite being backed by a well-funded management university, the Authors cannot imagine having borne this price from their research grant. In simpler terms, this Paper would not have been possible without the support of the university's library, which provided access to most of the cited and referenced literature, either through subscription or via inter-library loans.

Having concluded the fair dealing analysis, the position stands thus:

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[366] Chancellor, Masters & Scholars of Univ. of Oxford v. Rameshwari Photocopy Servs., (2017) 69 PTC 123 (Del.).

[367] *Id.*

[368] Larivière et al., *supra* note 4, at 11.

[369] Journals publishing revenues are generated primarily from academic library subscriptions (68-75% of the total revenue), followed by corporate subscriptions (15-17%), advertising (4%), membership fees and personal subscriptions (3%), and various author-side payments (3%). JOHNSON ET AL., *supra* note 3, at 21.

[370] *Id.*

[371] *Id.* at 135-39 ("[T]he consensus view suggests that roughly 15-20% of new articles were immediate (gold or hybrid) OA by 2016.").

Factor	Findings	Favours Publishers or Sci-Hub
The purpose and character of the infringing use	Purpose: Educational and Non-Commercial Character: Non-transformative	Either neutral or favours Sci-Hub
The nature of the copyrighted work	If the Court cannot rely on a bright-line rule	Neutral
	There is precedent that favours appreciating scholarly literature as factual and informative, rather than creative	Favours Sci-Hub
The portion used in relation to the copyrighted work as a whole	Entire copyrighted works form part of the secondary use. However, total appropriation does not need to be detrimental	Neutral
The effect of the use upon the potential market for or value of the copyrighted work	Individual researchers are not the market for academic publishers	Favours Sci-Hub

CONCLUSION

Academic publishing is in flux. With the growth of the OA movement, the academic publishing marketplace is abounding with business models, each with its own merits and demerits. Unfortunately, initially seen as a potential solution to the serials crisis, the progress of the OA movement has remained underwhelming over the past two decades. With the cost of subscriptions far outpacing the growth of library budgets, the serials crisis can further suffocate libraries and academics in the coming decades.[372]

Against this background, the growth of academic pirates has left academic publishers mourning over lost profits. On the other hand, libraries have lost patrons who now rely on pirated literature to find access to relevant scholarship. One may concede that academic pirates, including Sci-Hub, may not be the answer to the problems faced by the academic publishing market. While Sci-Hub may help the access problem, academic publishers' restrictive and closed licensing terms discourage research endeavours such as legal machine reading or text and data mining, which limit the secondary use of research and scholarship.[373]

[372] Lindsay Cronk, *Resourcefully: Let's End the Serials Crisis*, 79 SERIALS LIBR. 78, 79-81 (2020).

[373] Ernesto Priego, *Signal, Not Solution: Notes on Why Sci-Hub Is Not Opening Access*, WINNOWER (Feb. 23, 2016), https://thewinnower.com/papers/3489-signal-not-solution-notes-on-why-sci-hub-will-not-open-access.

Apart from licensing issues, Sci-Hub does not bring a cultural change in the academic community. Career trajectories of academics will continue to be dominated by metrics such as impact factors or H-Indexes. They will continue to willingly forego their intellectual property in research articles to for-profit publishers and perform editorial and peer-review-related tasks without compensation. The publishers will monetize this free labour in the interest of their shareholders. What if the publishers find a solution to academic piracy? The academic community will continue to be plagued by its problems, and the *access problem* will endure.

Further, the legality of the Sci-Hub database remains highly contested across jurisdictions. The fair dealing doctrine may protect the database from copyright infringement liability. However, the arguments made in Part V of this Paper are admittedly very optimistic. Most of the judicial opinions relied upon in Part V do not share a factual similarity with the Sci-Hub litigation. A court could easily distinguish these judgements and discredit their precedential applicability. Apart from copyright law, many other legal challenges plague the database. For example, various reports of data phishing by and on behalf of Sci-Hub have come to light,[374] which is why the City of London Police's Intellectual Property Crime Unit has warned students against using the database.[375]

Given all of these reservations, it is important to underline what Sci-Hub represents. The widespread user base that the pirate website has amassed emphasises two crucial aspects: the academic publishing market's implosion and the serials crisis's omnipresence.

As for finding a solution for the issue, the Authors highlight three approaches amongst the many solutions discussed in scholarly literature. First, researchers can spread awareness about Green OA and learn how to leverage the Green OA literature already archived over the internet. There are tools available as websites and browser extensions that use Open DoI to identify Green OA versions of the required research articles. Some examples are Unpaywall, Open Access Button, Kopernio, and

[374] Sean Coughlan, *Police Warn Students to Avoid Science Website*, BBC NEWS (Mar. 19, 2021), https://www.bbc.com/news/education-56462390.

[375] *Police Warn Students and Universities of Accessing an Illegal Website to Download Published Scientific Papers*, CITY OF LONDON POLICE (Mar. 19, 2021, 8:17 AM), https://www.cityoflondon.police.uk/news/city-of-london/news/2021/march/police-warn-students-and-universities-of-accessing-an-illegal-website-to-download-published-scientific-papers/.

LazyScholar.[376] Academic social networks, such as SSRN or ResearchGate, should also be explored for their contribution to the OA movement.

Second, the publishing industry and its revenue stream need to be radically changed. Scholars have taken different positions on how to achieve this. In 2019, Toby Green argued for a two-step publishing process, where authors would first use a preprint repository to test if an article is worthy of being formally published in OA journals. This could reduce the overall number of publications and thus reduce the costs of academic publishing. Further, it would require that researchers and scholars "self-promote" their articles to ensure publication, resulting in wider dissemination of research.[377] Professor Jeff Pooley argues that libraries should take their rightful place in the academic publishing business and redirect their subscription costs to develop a "collectively funded publishing ecosystem." This would include library partnerships and in-house-library publishing units. Pooley also discusses some journals and libraries which have subscribed to this model as proof of concept.[378] Advertising can be another avenue to flourish publishers' revenue streams. Furthermore, articles can be archived over the internet, where access can be provided without payment. A threshold can be placed where only a limited number of articles can be downloaded per user per day.

Third, the serials crisis can be solved by legislative intervention. Multiple scholars have suggested models, which redefine copyright law to accommodate the unique interests of scholarly research and academic publishing. Professor Steven Shavell published a paper in 2010 where he argued for the elimination of copyright for academic works.[379] While radical, Professor Shavell's model has been widely discussed and critiqued.[380] Professor Wadim Stielkowski argues that a subscription model similar to Apple Music, Spotify, or Netflix should be developed: individual authors would buy access to a publisher's database and pay a small monthly or

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[376] Mahesh Gadhvi, Shival Srivastav & Rajesh Sharma, *Access to Scientific Literature: Legitimate Channels*, 64 INDIAN J. PHYSIOLOGY & PHARMACOLOGY 155, 156 (2020).

[377] Toby Green, *Is Open Access Affordable? Why Current Models Do Not Work and Why We Need Internet-Era Transformation of Scholarly Communications*, 32 LEARNED PUBL'G 13, 18 (2019).

[378] Jeff Pooley, *The Library Solution: How Academic Libraries Could End the APC Scourge*, SSRC: ITEMS (Sept. 3, 2019), https://items.ssrc.org/parameters/the-library-solution-how-academic-libraries-could-end-the-apc-scourge/.

[379] Steven Shavell, *Should Copyright of Academic Works Be Abolished?*, 2 J. LEGAL ANALYSIS 301, 304 (2010).

[380] *See, e.g.*, SCHEUFEN, *supra* note 54, at 142-43 (arguing Shavell's model to remove copyright protection for academic works fails a legal feasibility requirement and is not reasonable from an economics perspective).

annual subscription fee. Professor Stielkowski relies on the fact that such subscription models have bulldozed the rampant music piracy from the early 2010s.[381]

Another issue with academic publishing is the "Ingelfinger Rule," which provides that a journal "reject a paper if it had been published elsewhere, in whole or substance."[382] This precludes authors from making their articles available through Green OA.[383] To counter this rule, an inalienable secondary publication right should limit copyright protection in academic works.[384] This would allow authors to archive their research at any stage despite their contractual obligations towards the publisher.[385] Germany can be understood as the proof of concept for such a law, as they enacted an inalienable right of secondary publication on June 27, 2013.[386] The law provides any researcher with an inalienable right to make her research available to the public one year after the primary publication.[387]

While all of these models have merit, no single option can alleviate the serials crisis. The academic publishing industry needs to look at Sci-Hub's download corpus as a sign that their business model is outdated and needs to develop an alternative approach. At the same time, the international copyright regime needs to respond to the serials crisis and negotiate some limitations on the copyright monopoly, ensuring that the commodification of knowledge cannot extract very high profit margins. Before these models become viable and can be scaled across the entire industry, the Green OA movement needs to gain traction. Researchers and academics need to be made aware of the serials crisis and the Green OA Road. Funding organisations should also develop mandates promoting Green OA.

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[381] Wadim Strielkowski, *Will the Rise of Sci-Hub Pave the Road for the Subscription-Based Access to Publishing Databases?*, 33 INFO. DEV. 540, 541 (2017).

[382] Lawrence K. Altman, *The Ingelfinger Rule, Embargoes, and Journal Peer Review-Part 1*, 347 LANCET 1382, 1382 (1996).

[383] Larivière et al., *supra* note 4, at 12.

[384] SCHEUFEN, *supra* note 54, at 143.

[385] *Id.* at 144.

[386] *Id.*

[387] Urheberrechtsgesetz [UrhG] [Act on Copyright & Related Rights], Sept. 9, 1965, BGBl I at 1273, as amended, Dec. 20, 2016, BGBl I at 3037, § 38(4) (Ger.).

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THE FOOD MICROBIOME AS TRADITIONAL KNOWLEDGE

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INTRODUCTION

For centuries, bacteria, yeasts, and molds have been used to produce fermented foods and beverages.[1] Throughout the world, fermented products are increasing in popularity in regions where their production has been relatively limited. In the United States, for example, many traditional fermented foods from Europe, Asia, Africa, and South America have become available due to a growing number of large- and small-scale producers.[2] These fermented goods may incorporate novel ingredients, processes, or local microbial communities that differ from those of the places where these products are traditionally made. At the same time, more and more studies are using various genomic and environmental sequencing approaches to uncover the taxonomic, genetic, and functional diversity of many fermented food microbiomes.[3] The confluence of expanded production in new geographic regions and the application of new technologies to traditional products raises important questions not only about how to delimit microbial species' identities, but also about how intellectual property doctrines can account for shifting characterizations of fermented foods' probiotic compositions.

One rapidly emerging practice is to portray the microbial strains and ecosystem within fermented foods as unique to specific production facilities or geographic regions.[4] However, if the same fermented food is made in many different geographic locations, does it possess unique microbes based on location? Do those geographic differences in microbial composition translate into differences in product quality that consumers can reasonably attribute to particular regions? As scientists

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[1] *See* ROBERT W. HUTKINS, MICROBIOLOGY AND TECHNOLOGY OF FERMENTED FOODS 1, 4 (2d ed. 2018) (describing how molecular archaeology has shown that wine has been produced in the Near East regions since the Neolithic Period, 8500 to 4000 B.C.E.).

[2] *Cf.* INNOVATIONS IN TRADITIONAL FOODS 1-51 (Charis M. Galanakis ed. 2019) [hereinafter INNOVATIONS]; Aly Farag El Sheikha, *Revolution in Fermented Foods*, *in* MOLECULAR TECHNIQUES IN FOOD BIOLOGY 239, 239-60 (2018).

[3] *See generally* E.J. Smid & J. Hugenholtz, *Functional Genomics for Food Fermentation Processes*, 1 ANN. REV. FOOD SCI. & TECH. 497 (2010); Mohamed Mannaa et al., *Evolution of Food Fermentation Processes and the Use of Multi-Omics in Deciphering the Roles of the Microbiota*, 10 FOODS 2861 (2021); Meichen Pan & Rodolphe Barrangou, *Combining Omics Technologies with CRISPR-Based Genome Editing to Study Food Microbes*, 61 CURRENT OP. BIOTECHNOLOGY 198 (2020).

[4] *See* Vittorio Capozzi, Pasquale Russo & Giuseppe Spano, *Microbial Information Regimen in EU Geographical Indications*, 34 WORLD PAT. INFO. 229, 229 (2012) (arguing that EC Regulation 510/2006 on EU microbial resource management in "Geographical Indications" production is not unequivocally defined and that regulation should require product information to specify the list of autochthonous microbial strains representing the "virtuous" microbial biodiversity of a specific *terroir* and/or given method of food production).

uncover patterns of microbial diversity in fermented foods, another set of questions emerges about the intellectual property protections available, especially for artisanal producers. Unlike many other foods—for which it is difficult to quickly reproduce unique ingredients from competitors' products—it is relatively straightforward to isolate and propagate microbes from raw fermented foods. What are the legal protections available for the microbial cultures used in fermented foods? Can an American cheese producer legally isolate and use microbes from a French cheese? What national and international laws are available to protect the identity of fermented food microbes? And what novel approaches or technologies might provide new protections of microbial cultures in fermented foods?

In this Article, I explore the intersection of microbial diversity and intellectual property protection for microbial communities of fermented food. I ultimately argue that the "microbiome" should be regarded as a genetic resource and, when its distinctiveness is rooted in geographic origin, should be considered akin to traditional knowledge. I begin by providing an overview of the evidence for unique microbial identities across fermented food producers and production areas. Section I(A) presents an overview of the issues with defining the terms "microbes" and "fermentation," highlighting a lack of clarity not only in the legal sphere but also with regard to what should constitute the scientific bases for a legal definition. In Section I(B), I discuss the relationship between foods' unique characteristics and their geographic origin, and I evaluate the possibility of utilizing patterns of microbial diversity as a basis for intellectual property protections. In this Section, I also discuss the important notion of *terroir* and assess the possibility of expanding its applicability to the whole of microbial patterns that contribute to the taste, odor, and texture of foods.

Section II(A) explores options to protect the intellectual property of fermented foods vis-à-vis their microbial composition. I briefly reconstruct the history of legal appellation systems for the protection of foodstuff based on geographic origin. I highlight the peculiarity of "Geographical Indications" (GIs) as the only kind of intellectual property rights based on collectively held traditions, contrast them to standard trademarks, and discuss challenges to implementing GI protections arising from the global coexistence of different legal and economic traditions. In this context, I discuss US hostility toward European Union institutions of GIs (largely perceived as hindrances to the free market) and the failure of the US to be party to important international agreements. In Section II(B), I reflect on the legal mechanisms already in place through which intellectual property rights may be obtained for fermented foods. While there exists little in the way of legal protections for natural starter cultures, fermented food producers in the US can obtain protections for the fermentation biotechnologies they utilize. I remark that while in

the US intellectual property is mostly privately enforced and the system primarily uses trademark law to protect artisanal fermented products geographically, in the EU it is national and supranational bodies that preside over the creation and implementation of GI regulations. I predict that shifts in consumer demand in the US will lead to an increasing quest for EU-style intellectual property protections, albeit through different legal mechanisms.

Section III notes that while patents remain unavailable as a legal resource for the protection of naturally occurring microbiota, trade secret laws could protect biotechnological resources used in the production of fermented foods. This route, however, presents some problems—the use of trade secrecy for microbiome science risks undermining the structure of incentives that constitutes the basis for intellectual property law. In Section III(A), I set forth a definition of *terroir* as collective knowledge possessed over generations by a community. In Section III(A)(1), I include an overview of the most relevant provisions of the Nagoya Protocol and of the difficulties into which one runs when attempting to see the protection of microorganisms as contemplated under the Nagoya Protocol's provisions. In Section III(A)(2), I introduce the notion of "traditional knowledge," commonly defined as a body of knowledge collected and cultivated by a group of people across generations. I argue that the creation of a microbiome in a local context should be understood as a form of traditional knowledge. Thus, in Section III(A)(3), I go on to contend that, for several reasons, the protection of traditional knowledge of local microbiomes through trade secrets constitutes the most reasonable option to provide legal protections in the case of artisanal fermented foods. I conclude by proposing some precautions that can mitigate the weaker exclusionary rights offered by trade secret laws relative to other forms of intellectual property. This Article expands upon a preexisting conversation on the legal protections for fermented foods[5] by incorporating new perspectives emerging from genomic and metagenomic sequencing studies and by adopting a comparative approach for both the United States and Europe.

I
SCIENTIFIC AND LEGAL BOUNDARIES OF FERMENTED FOODS' MICROBIOME

A. Issues with Defining "Microbes" and "Fermentation"

From a legal point of view, the term "microbe" (or equivalently "microorganism") often applies to any biological material that is microscopic in

[5] *See id.*; *see also* Vittorio Capozzi et al., *Genome Sequences of Five* Oenococcus oeni *Strains Isolated from Nero di Troia Wine from the Same Terroir in Apulia, Southern Italy*, 2 GENOME ANNOUNCEMENTS 1, 1-2 (2014).

scale, most commonly including bacteria and fungi, but also viruses, "protozoa," unicellular algae, and so forth.[6] "Microbe" represents an imprecise working definition rather than a scientific term of art. Due to uncertainty as to how organisms qualify as microbes, the EU, for example, has discontinued use of the term "microorganism" in favor of "biological material," defined as any material containing genetic information and capable of replicating itself or of being reproduced in a biological system.[7]

Even a scientific definition of microbial species or strains is somewhat lacking in a theoretical basis, and the extent to which phenotype or genotype should be used to delimit species or strains is still intensely contested.[8] Often a polyphasic approach, at least in bacterial taxonomy, is recommended, whereby strains showing a high degree of phenotypic and/or genotypic similarity to a type of strain are considered to belong to the same species.[9] At the same time, a standardized measure of relatedness (such as degree of genome hybridization or sequence similarity) has yet to be agreed upon, and a simple definition of bacterial species remains elusive.[10]

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[6] *See, e.g.*, 18 U.S.C. § 178(1)-(2); *Definition of "Microorganism,"* NIH NAT'L CANCER INST., https://www.cancer.gov/publications/dictionaries/cancer-terms/def/microorganism (last visited May 16, 2022) (defining a microorganism as "[a]n organism that can be seen only through a microscope. Microorganisms include bacteria, protozoa, algae, and fungi. Although viruses are not considered living organisms, they are sometimes classified as microorganisms"); *see also* Janani Hariharan, *What Counts as a Microbe?*, AM. SOC'Y MICROBIOLOGY (Apr. 11, 2021), https://asm.org/Articles/2021/April/What-Counts-as-a-Microbe ("'Microbe' is a convenient and practical term to introduce novices to the multitudes of the microbial world, but professional microbiologists might want to ask themselves what they mean when they say 'microbe': did they study the fungal community? Or the bacterial community? Or the phages that infect bacteria? In the microbial world, the devil is in the details.").

[7] Soundarapandian Sekar & Dhandayuthapani Kandavel, *The Future of Patent Deposition of Microorganisms?*, 22 TRENDS BIOTECHNOLOGY 213, 214 (2004).

[8] *See* Jeremy R. Dettman et al., *Reproductive Isolation and Phylogenetic Divergence in* Neurospora*: Comparing Methods of Species Recognition in a Model Eukaryote*, 57 EVOLUTION 2721, 2740-41 (2003) (showing that mating type, parental role, and species identity of parental individuals could influence the reproductive success of matings); Ramon Rosselló-Móra & Rudolf Amann, *Past and Future Species Definitions for* Bacteria *and* Archaea, 38 SYSTEMATIC APPLIED MICROBIOLOGY 209, 210 (2015) (arguing that bacteriologists' main point of disagreement over what constitutes a species is definitional, that is, "the way species are circumscribed by means of observable characters," rather than conceptual, that is, "the idea of what a species may be as a unit of biodiversity, the meaning of the patterns of recurrence observed in nature, and the why of their existence").

[9] P. Vandamme et al., *Polyphasic Taxonomy: A Consensus Approach to Bacterial Systematics*, 60 MICROBIOLOGICAL REVS., 407, 408 (1996).

[10] *See* David S. Hibbett & John W. Taylor, *Fungal Systematics: Is a New Age of Enlightenment at Hand?*, 11 NATURE REVS. MICROBIOLOGY 129, 129, 132 (2013); Jongsik Chun & Fred A.

Similar difficulties exist for fungi, in which case further confusion arises with regard to the use of such terms as "yeast" and "filamentous."[11] In practice, both bacterial and fungal species' names are mentioned according to their most recently accepted scientific nomenclature, which, especially in the case of microbes, is often under constant revision.[12] More recent advances in environmental DNA sequencing will likely contribute to a more robust understanding of microbes' community composition, strain-level specificity, and geographic uniqueness.[13]

Similar confusion arises from the use of "fermentation," as there exists no apparent phylogenetic trend explaining which bacteria and fungi are useful as starters, or how the chemical process itself should be defined. Scientifically, fermentation relies on the principle of oxidation of carbohydrates and related derivatives to generate acids, alcohol, and/or carbon dioxide, often resulting in improved food preservation, texture, taste, and aroma, in addition to greater nutritional quality and reduced toxicity.[14] Strictly speaking, fermentation as a chemical process applies to an anaerobic system, but the term is commonly applied to both aerobic and anaerobic carbohydrate digestion.[15]

Rainey, *Integrating Genomics into the Taxonomy and Systematics of the* Bacteria *and* Archaea, 64 INT'L J. SYSTEMATIC & EVOLUTIONARY MICROBIOLOGY 316, 318 (2014) (discussing the ways in which advances in genomics and computational technology have improved taxonomy methods for identifying *Bacteria* and *Archaea*).

[11] A "yeast" is typically a fungal species consisting of single cells, the most famous of which is baker's yeast, *Saccharomyces cerevisiae*. A "filamentous" fungus produces a hyphal network consisting of hundreds of interconnecting cells. Further confusion arises with some species' alternation between a yeast and filamentous morphology due to different life phases, environmental conditions, or subspecies characteristics. *See* François Bourdichon et al., *Food Fermentations: Microorganisms with Technological Beneficial Use*, 154 INT'L J. FOOD MICROBIOLOGY 87, 90 (2012).

[12] G. Sybren de Hoog et al., *Name Changes in Medically Important Fungi and Their Implications for Clinical Practice*, 53 J. CLINICAL MICROBIOLOGY 1056, 1060 (2015) (identifying issues in the naming conventions of fungi and proposing suggestions to improve the practice); *see also* John W. Taylor et al., *Eukaryotic Microbes, Species Recognition and the Geographic Limits of Species: Examples from the Kingdom Fungi*, 361 PHIL. TRANSACTIONS ROYAL SOC'Y B 1947 (2006) [hereinafter *Eukaryotic Microbes*] (discussing different methods of species recognition in fungi).

[13] Conor J. Doyle, Paul W. O'Toole & Paul D. Cotter, *Metagenome-Based Surveillance and Diagnostic Approaches to Studying the Microbial Ecology of Food Production and Processing Environments*, 19 ENV'T MICROBIOLOGY 4382, 4386 (2017).

[14] HENRY J. PEPPLER & DAVID PERLMAN, MICROBIAL TECHNOLOGY: FERMENTATION TECHNOLOGY (1979).

[15] *Id.*

Fermentation is not formally defined under many legal frameworks, although the processes and organisms used therein are explicitly regulated. In the United States, food and food additives are regulated according to the Food Drug and Cosmetic Act. Notably, the Act makes no mention of fermentation, and microbes are instead interpreted to be included under the category of "food additives."[16] In the European Union, microbes are categorized as ingredients and must satisfy the legal requirements of a risk assessment performed by the Scientific Committees assisting the Directorate General for Health and Consumers.[17]

Perhaps due to such definitions, legal practitioners have deferred to inventors' or assignees' innovations by, for example, developing a genetically modified strain of bacteria that improves lactic acid breakdown, or engineering a fermentation process that is both novel and innovative for the production of a given product.[18] Starters are presumed to be ubiquitous in nature, and fermentation is a "natural process." Thus, in the same way in which one could not "own" the rights to a naturally occurring human gene, producers of fermented foods via natural starters and spontaneous chemical processes have limited means of protecting their products using traditional routes, such as through patents.[19]

B. Disentangling Biogeography from Geographic Uniqueness

One framework for defining potential legal protections for fermented food microbes is geographic uniqueness. If both the species and strains within fermented food communities exhibit non-random patterns of diversity for similar food products across a geographic area, these quantifiable patterns could serve as units of intellectual property protection. For example, the French term *terroir* has been used to justify and legally defend the uniqueness of many European wines on a geographic basis and, more recently, on a global scale.[20] For some time now, connoisseurs as

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[16] 21 U.S.C. §§ 301-92 (Suppl. 5 1934).

[17] Theodor Brodmann et al., *Safety of Novel Microbes for Human Consumption: Practical Examples of Assessment in the European Union*, FRONTIERS MICROBIOLOGY 1, 1 (2017).

[18] *E.g.*, Fermentation and Recovery Process for Lactic Acid Prod., U.S. Patent No. 5,464,760 (filed Oct. 23, 1992); Centrifugal Fermentation Process, U.S. Patent No. 6,214,617 B1 (filed Dec. 31, 1998); Probiotic, Lactic Acid-Producing Bacteria and Uses Thereof, U.S. Patent No. 6,461,607 B1 (filed Aug. 5, 1999); Sys. and Method for Making Enhanced Cheese, U.S. Patent No. 6,120,809 (filed Oct. 28, 1998).

[19] Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 580 (2013).

[20] *See generally* Éric Rouvellac, *Le terroir, essai d'une réflexion géographique à travers la viticulture*, 1 UNIVERSITÉ DE LIMOGES (2013) (Fr.) (discussing the definition of and origins of the term *terroir*); THOMAS PARKER, TASTING FRENCH TERROIR: THE HISTORY OF AN IDEA 15, 15-17 (2015) ("The word *terroir* is today most prevalent among culinary enthusiasts, who use it to map a food or wine to its specific place or origin.").

well as an increasing number of scientists have been claiming that a given region's signature combination of biotic and abiotic variables imparts a distinctive quality to wine.[21] More recently, these claims have been extended to other fermented products, such as cheese, sourdough breads, and other fermented beverages.[22] This so-called *microbial terroir* has become a buzz term in many food circles, but like its relative, *terroir*, it is still a nebulous and poorly defined concept.[23]

To properly situate debates over *terroir*, it is important to disentangle the term from microbial biogeography more generally. It is now well-established that some microbes can be found throughout the globe, while others can be found only on a limited geographical scale.[24] The notion of *terroir* not only acknowledges the centrality of local microbes in shaping local fermentation but goes one step further by linking microbial biogeography to traditional categories framing perception and practice.[25] As such, an understanding of the relationship between communities and their environments was of fundamental importance in shaping French regionalism during the nineteenth and twentieth centuries.[26] Although *terroir* literally translates as "earth" or "soil," it is more closely related to the notion of territory, derived from the Latin *territorium*.[27] *Terroir* is more properly viewed as a defined geographic region in which communities have shared and developed their traditional knowledge in relation to the land. This definition goes beyond the more restricted idea that *terroir* is simply the confluence of physical environmental factors that favor the

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[21] AMY B. TRUBEK, THE TASTE OF PLACE: A CULTURAL JOURNEY INTO TERROIR 18 (2008).

[22] *See eAmbrosia*, EUR. COMM'N, https://ec.europa.eu/info/food-farming-fisheries/food-safety-and-quality/certification/quality-labels/geographical-indications-register/ (last visited Mar. 19, 2022) (online database of agricultural products and foods registered and protected across the EU).

[23] Daniel Felder et al., *Defining Microbial Terroir: The Use of Native Fungi for the Study of Traditional Fermentative Processes*, 1 INT'L J. GASTRONOMY & FOOD SCI. 64, 69 (2012) (citing Heather Paxson, *Locating Value in Artisan Cheese: Reverse Engineering Terroir for New-World Landscapes*, 112 AM. ANTHROPOLOGIST 444 (2010) ("The importance of terroir is well understood as it relates to cuisine on a number of scientific and cultural levels, the recognition of microbial terroir is less well understood outside of cheese and wine-making.")).

[24] Kabir G. Peay, Martin I. Bidartondo & A. Elizabeth Arnold, *Not Every Fungus Is Everywhere: Scaling to the Biogeography of Fungal-Plant Interactions Across Roots, Shoots and Ecosystems*, 185 NEW PHYTOLOGIST 878 (2010) (emphasizing that some fungal species are highly endemic and disperse only on a local scale); Jennifer B. Hughes Martiny et al., *Microbial Biogeography: Putting Microorganisms on the Map*, 4 NATURE REVS. MICROBIOLOGY 102, 103-04 (2006).

[25] *See generally* TRUBEK, *supra* note 21, at 18.

[26] Tim Unwin, *Terroir: At the Heart of Geography*, *in* THE GEOGRAPHY OF WINE: REGIONS, TERROIR AND TECHNIQUES 37, 39 (Percy H. Doughtery ed., 2012).

[27] *Id.*

development of a distinctive *goût de terroir* ("taste of the territory").[28] *Terroir* is perhaps best seen as a community's symbiotic relationship with its local environment—a constructed biome favoring not only, for example, the cultivation of a unique grape cultivar, but also the microbial mélange of species that convene and find refuge in the vineyards. Consequently, the soil, plants, and microbiome—but also the traditional knowledge about how to create and care for all of the above—are properly seen as the patrimony of a community, contributing to a perceived *terroir* in the quality of their wine, cheese, shoyu, tequila, and so forth.

A definition of the biogeography and uniqueness of fermented food microbes requires that one define both taxonomic and biogeographic scales of microbial diversity. For some fermented foods such as wine, whose fermentation is dominated by just a few species, biogeographic patterns of microbial strains may matter most. For other fermented foods with more complex communities, both strain-level and community-level biogeographic patterns may emerge. The abovementioned question of the existence of a so-called *microbial terroir*—that is, the spontaneous presence of mainly bacteria and fungi unique to a fermentation process—has sparked further debate, as the geographic ranges of most microbes are unknown and largely depend on the definitions of species that are being employed and on the techniques that are being used to identify them.[29] Even greater difficulties arise from the unknown contributions of unique strains versus unique microbial communities; while some strains may be endemic to a specific region or fermentation process, the degree to which a fermented product's distinctiveness depends on a unique community of geographically-limited microbes is unknown.[30] This further complicates the applicability of geographically-limited intellectual property, as the domain wherein both strain- and community-level characterizations avail has yet to be legally defined, assuming doing so is technologically practical.[31]

Nonetheless, some find that abiotic environmental characteristics permit direct comparisons, and that in some cases there is a nonrandom biogeographic pattern of specific fermenter microbial communities.[32] In their discussion of cheese

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[28] *Id.*

[29] *Eukaryotic Microbes*, *supra* note 12, at 1948.

[30] *See* Capozzi et al., *supra* note 4, at 229.

[31] *Id.*

[32] *See* Helder Fraga et al., *Integrated Analysis of Climate, Soil, Topography and Vegetative Growth in Iberian Viticultural Regions*, 9 PLOS ONE 7 (2014); Edna F. Arcuri et al., *Determination of Cheese Origin by Using 16S rDNA Fingerprinting of Bacteria Communities by PCR–DGGE*, 30 FOOD CONTROL 1, 1-6 (2013); Nicholas A. Bokulich et al., *Associations Among Wine Grape Microbiome, Metabolome, and Fermentation Behavior Suggest Microbial Contribution to Regional Wine Characteristics*, MBIO 1 (2016).

rind microbial communities, Wolfe et al. show that in a sample of 137 types of cheese rind, 60% of the bacteria and 25% of the fungi are from non-starter culture species and therefore originate from environmental sources.[33] Moreover, species interactions and environmental factors select for communities with similar compositions, resulting in cheeses made in geographically distant parts of the world having strikingly similar rind communities.[34]

However, it is still unknown if microbial communities of the same type of cheese phenotypically differ sufficiently for us to be able to distinguish in them unique qualities that would justify speaking of a "*microbial terroir*." Modern data on strain- and community-level distinctiveness have led many to conclude that the unique qualities of artisanal fermented products are a direct result of unreproducible *terroir* and use them to justify geographically-confined intellectual property.[35] Recent evidence provides glimpses into how fermenter microbes confer a particular combination of characteristics, such as taste, odor, and texture.[36] For the paradigmatic example of wine, in 200 commercial wine fermentations, it is possible to distinguish viticultural areas and individual vineyards by their microbial consortia and unique chemical composition.[37] The diversity and quantity of microbes present in the soil and on the vine determine both the health of the grape and the eventual microbiome introduced during the fermentation and wine maturation processes. Vintners both directly and indirectly select for fungi and bacteria that not only effectively convert sugar and malic acid into wine, but also outcompete undesired microbes that could cause product toxicity or spoilage.

Although there are examples of population structure correlating to product quality among fermenting microbes, many unknowns linger even for the best-studied fermentation processes. Are species abundance and community structure an influence on phenotype and product quality? Or are they simply correlates driven by other causes?[38] Even if some general qualities imparted by endemic phenotypes

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[33] Benjamin E. Wolfe et al., *Cheese Rind Communities Provide Tractable Systems for In Situ and In Vitro Studies of Microbial Diversity*, 158 CELL 422 (2014).

[34] *Id.*

[35] Caroline Herody et al., *The Legal Status of Microbial Food Cultures in the European Union: An Overview*, 5 EUR. FOOD & FEED L. REV. 258, 258-59 (2010).

[36] Demarigny Yann & Gerber Pauline, *Usefulness of Natural Starters in Food Industry: The Example of Cheeses and Bread*, 05 FOOD & NUTRITION SCIS. 1679, 1686 (2014).

[37] Bokulich et al., *supra* note 32, at 1, 5.

[38] Danilo Ercolini et al., *Microbial Diversity in Natural Whey Cultures Used for the Production of Caciocavallo Silano PDO Cheese*, 124 INT'L J. FOOD MICROBIOLOGY 164, 170 (2008).

contribute to a product's overall distinctiveness, the scientific community is still unclear as to which are responsible for this process.[39]

II
GEOGRAPHY AND INTELLECTUAL PROPERTY REGULATORY SYSTEMS

A. Transnational Protection

The World Intellectual Property Organization (WIPO), a division of the United Nations based in Geneva, offers guidelines for the international and national regulation of intellectual property. However, it is the Paris Convention on Trademarks (1883), still in force with 176 members, and the more elaborate provisions contained in the 1958 Lisbon Agreement on the Protection of Appellations of Origin and Their Registration that set the parameters for geographically based intellectual property. The legal structure for appellation registration originated from the French wine industry's concept of *terroir* (that is, the notion that specific locations impart unique qualities on specific products).[40] In the twentieth century, a formal appellation system began to provide a legal basis for protecting products explicitly by their geographic origin.[41] Systems parallel to the French *appellation d'origine contrôlée* (AOC) have since developed across Europe and other regions.[42] Products with controlled appellations are required to adhere to a

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[39] Alessandro Martini, *Origin and Domestication of the Wine Yeast* Saccharomyces cerevisiae, 4 J. WINE RSCH. 165, 166 (1993); Jared Diamond, *Evolution, Consequences and Future of Plant and Animal Domestication*, 418 NATURE 700, 704 (2002); Justin C. Fay & Joseph A. Benavides, *Evidence for Domesticated and Wild Populations of* Saccharomyces cerevisiae, 1 PLOS GENETICS 0066 (2005).

[40] Rouvellac, *supra* note 20; Fraga et al., *supra* note 32, at 9; PARKER, *supra* note 20; Ignacio Belda et al., *From Vineyard Soil to Wine Fermentation: Microbiome Approximations to Explain the "Terroir" Concept*, 8 FRONTIERS MICROBIOLOGY 821 (2017); Mark A. Matthews, *The Terroir Explanation*, *in* TERROIR & OTHER MYTHS OF WINEGROWING 146, 146-206 (1st ed. 2015); Unwin, *supra* note 26.

[41] Loi du 6 mai 1919 relative à la protection des appellations d'origine [Law of May 6, 1919 Relating to the Protection of Designations of Origin], JOURNAL OFFICIEL DE LA RÉPUBLIQUE FRANÇAISE, May 8, 1919, p. 4725.

[42] *See, e.g.*, Lei n.˚ 8/85 de 4 de junho [Act no. 8/85 of 4 June], igf.gov.pt/leggeraldocs/LEI_008_85.htm, amended by Decreto-Lei n.º 212/2004 de 23 de Agosto [Decree-Law no. 212/2004 23 August], https://www.igf.gov.pt/leggeraldocs/DL_212_2004.htm#ARTIGO_23 (Portuguese legal framework indicating requirements for the labelling of wine to indicate designations of origin and geographical indications). In addition, the European Union introduced the protection of geographical indications and designations of origins in 1992. *See* Council Regulation 2081/92 of 14 July 1992 on the Protection of Geographical Indications and Designations of Origin for Agricultural Products and Foodstuffs, 1992 O.J. (L 208) 1, 1-8. One example of this protection is

set of rigorous and clearly-defined standards, failure to comply with which results in a prohibition against manufacturing and selling a product under, for example, AOC control.

The 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is the current principal basis for the international protection of goods. "Geographical indications" (GIs) mark goods "originating in the territory of a member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographic origin."[43] In practice, there exist two categories of registered GIs, namely Protected Designation of Origin (PDOs), whereby the entire product must be traditionally and entirely manufactured (prepared, processed, and produced) within a specific region, and Protected Geographical Indications (PGIs), for cases in which at least one of the stages of production, processing, or preparation takes place in a given region.[44] Among the most famous products within the context of fermented foods are Champagne (PDO, AO 243), Comté Cheese (PGO, AO 455), Stilton Blue Cheese (PGI), and Parma Ham (PDO, WIPO AO 843).[45] In 2015, the Geneva Act to the Lisbon Agreement was adopted, formally recognizing GIs as extending certain property rights to producers on a geographic basis.[46]

The main characteristic that distinguishes GIs from other intellectual property rights is that they are based on traditions held by communities of people, owned and exercised collectively. The main advantage of GIs is the "relative impersonality" of the right; the subject matter is first and foremost protected (for example, an orange for "Florida Oranges") and therefore not dependent on a specific rights-holder.[47]

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in Greece: "Protected Designation of Origin (PDO) Wines" of Greece are required to display certain geographical indications and information on their labels; in essence, the wines originate in "the historical winegrowing and winemaking areas of Greece." *Wine categories*, WINES OF GREECE, https://winesofgreece.org/articles/wine-categories/ (last visited Apr. 12, 2022).

[43] Agreement on Trade-Related Aspects of Intellectual Property Rights art. 22, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299, 33 I.L.M. 1197 [hereinafter TRIPS Agreement].

[44] *Quality Schemes Explained*, EUR. COMM'N, https://ec.europa.eu/info/food-farming-fisheries/food-safety-and-quality/certification/quality-labels/quality-schemes-explained_en#pdo (last visited Mar. 22, 2022).

[45] Dominique Barjolle & Bertil Sylvander, *PDO and PGI Products: Market, Supply Chains and Institutions* (2000).

[46] Geneva Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of Their Phonograms, Oct. 29, 1971, 866 U.N.T.S. 67.

[47] Felix Addor & Alexandra Graziol, *Geographical Indications Beyond Wines and Spirits: A Roadmap for a Better Protection for Geographical Indications in the WTO/TRIPS Agreement,* 5 J. WORLD INTELL. PROP. 865, 894 (2002).

Much like trademarks, GIs confer the exclusive right to use the designation, albeit within a certain geographic area. However, while a trademark is not inherently capable of being descriptive of the goods or services,[48] a GI is descriptive by definition as its very purpose is to distinguish a product or service from competitors by its geographical origin. Therefore, one shortcoming of GIs is that in many countries they cannot be registered as a trademark in a jurisdiction that would insufficiently distinguish the product or where GIs as such are unrecognized.

B. Branding Microbiota: EU vs. US

Due to national differences in regulation and standards, international disputes pertaining to name usage have developed between the EU and US.[49] Linking food products to specific environmental conditions remains a contentious practice of international trade, and the European and US approaches to the matter markedly contrast. The results of the Uruguay round of the General Agreement on Tariffs and Trade (GATT), later incorporated into TRIPS legislation, set a framework for regulating GIs internationally with the WTO arbitrating disputes. However, the WTO has proven inconsequential in significantly penalizing what the EU denounces as US, Australian, and New Zealand's violations of TRIPS. Specifically, Article 23 of TRIPS stipulates that each signing member must enact laws preventing the use of GIs that do not originate from a designated geographical location, focusing mainly on wines and spirits.[50] Nonetheless, many US producers continue to legally use European GIs due to an exception, outlined in Article 24, to Article 23's general prohibition of the continued use of geographical indications. As many US producers have used European GIs for decades, producers who began production 10 years before TRIPS (April 15, 1984) are authorized to use generic names, such as "Burgundy" or "Chianti." As a result, a regulatory disparity between New- and Old-World wines or other fermented food products remains unaddressed. Despite international efforts to harmonize intellectual property on a global scale, dissonance among national GI doctrines continues to make their cross-border enforcement more precarious than that of most other forms of intellectual property.

Notably, the US is party neither to the original Lisbon Agreement nor to the more recent Geneva Act. Additionally, there has been considerable difficulty in

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[48] *See* TRIPS Agreement, *supra* note 43, at art. 15.1.

[49] *Cf.* Michael Handler, *The WTO Geographical Indications Dispute*, 69 MOD. L. REV. 70 (2006).

[50] TRIPS Art. 23. For a discussion of the geographical provisions of the TRIPS agreement, see generally Leigh Ann Lindquist, *Champagne or Champagne? An Examination of U.S. Failure to Comply with the Geographical Provisions of the TRIPS Agreement*, 27 GA. J. INT'L & COMP. L. 309 (2014).

regulating such appellations on an international scale, despite trade agreements such as the Lisbon Agreement and TRIPS. The predominantly EU institutions of GI are regarded in the US more as hindrances to the free market—inasmuch as they narrow competition and fix capital on a geographic basis—although a reduced appellation system has been enforced in some cases—for example, in certain US wine-growing regions, for which 85% of the wine must have been produced from grapes grown in one of 239 American Viticultural Areas (AVA).[51] The principal means by which products are recognized in the US is instead trademarks, identifying a good or service as originating from a particular company or individual. Unlike GIs, which are usually predetermined by the name of a geographical area, trademark law has no explicit geographic component. A trademark can make reference to a place with or without an actual association to said location, for example the Idaho Potato Commission's "Idaho Potatoes" and "Grown in Idaho" registered trademarks for potatoes.[52] Various standards of identity are also in place in the US (for example, for dairy products) under the United States Code of Federal Regulations, which are essentially quality standards for products to be labeled under specific categories. Examples include US products such as "Munster (133.160)," "Gorgonzola (133.141)," and "Parmesan and Reggiano (133.165)" cheeses—brands otherwise protected in the EU (under AO 505, 927, 513).

Nonetheless, some legal mechanisms are already in place in the US by which producers of fermented foods can obtain intellectual property rights within the context of fermentation biotechnologies in lieu of securing direct protection of their microbiota. Trademark law is the most established legal framework for producers to secure intellectual property protection for artisanal fermented foodstuffs on a geographic basis. While the US Patent and Trademark Office generally prohibits the registration of place names as part of a trademark, geographic signs may be protected if "it is clear that they are meant to convey some meaning other than geographic origin."[53] Examples relevant to fermented foods include WISCONSIN DAIRIES (Registration No. 1298995) and JEFFERSON'S RESERVE VERY OLD KENTUCKY STRAIGHT BOURBON WHISKEY (Registration No. 3505374). In the case of many natural starters, trademarks that specify both the product (such as cheese) and the region (such as "Vermont Alehouse Cheddar," Serial No. 85221576)

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[51] *See* 27 U.S.C. § 9 (2022).

[52] IDAHO POTATOES, Registration No. 2,934,385; GROWN IN IDAHO, Registration No. 2,914,309.

[53] *See* K. William Watson, *Reign of Terroir: How to Resist Europe's Efforts to Control Common Food Names as Geographical Indications*, CATO INSTITUTE, Feb. 16, 2016, at 1, 2, https://www.cato.org/policy-analysis/reign-terroir-how-resist-europes-efforts-control-common-food-names-geographical.

provide a straightforward method by which fermented food producers can secure intellectual property rights for both the quality of their products and the microbial communities presumably unique to their production methods, materials, and facilities.

Regional cooperatives can also register products using "Collective Marks" or a "Certification Mark," which differ slightly from the more traditional trademark. The owner of a Certification Mark cannot produce the product or use the mark itself; rather, the Certification Mark regulates its usage on behalf of a given consortium or guild in order to certify, among other things, a product's regional origin and quality.[54] Among the most cited examples of the ability of Collective Marks to confer geographic attribution in the US are MISSOURI WINES and NAPA VALLEY.[55] Similarly, Collective Marks indicate that the user is a member of a particular organization without indicating the origin of goods or services.[56] Thus, depending on the nature of intellectual property protection sought by businesses dependent on natural starters, product-specific cooperatives could be formed on a geographic basis, ensuring that a brand's quality goes hand in hand with its geographic origin.

In the US, intellectual property law concerning GIs is mostly privately enforced (that is, litigating infringement is at the discretion of private holders of, for example, a given trademark). European legislation, more keen to uphold the concept of *terroir* and national patrimony, delegates regulation of GIs to both national and supranational regulating bodies.[57] While the US initiated the development of the TRIPS Agreement, the EU has since been the greatest advocate for Article 23 and the international protection of GIs.[58] While GIs are criticized as protectionism and an attempt to limit commerce on a geographic basis, the EU contends that strict government protection of GIs ensures that producers not only be located in a specific region but also conform to highly-controlled production directives and quality standards.[59] Among the most common examples of such products are Parmigiano-Reggiano cheese and Champagne,[60] for which European law stipulates not only the specific methods that must be employed in order to qualify as a given GI product

[54] 15 U.S.C. § 1054.

[55] MISSOURI WINES, Registration No. 3606768; NAPA VALLEY, Registration No. 4853438.

[56] *See* Lanham Act, 15 U.S.C. §1127.

[57] *See* Watson, *supra* note 53, at 1.

[58] Lindquist, *supra* note 50, at 310-11, 343.

[59] *Id.*

[60] *See* Deborah J. Kemp & Lynn M. Forsythe, *Trademarks and Geographical Indications: A Case of California Champagne*, 10 CHAPMAN L. REV. 257, 258, 274, 279-80 (2007).

(such as exact cheese ripening time, specific pasteurization techniques, and precise additive measures), but also the regions in which a product can be produced.[61]

In the case of European fermenter microbes, the microbial communities unique to a region are implicitly protected by a given GI. Nonetheless, the recent interest of American consumers in locally produced and fermented foods, paired with the booming US intellectual property market, set the stage for expanded use of existing US legal protection for industries that rely on microbial fermentation.[62] Since the 1990s, more than one-third of all milk produced by volume in the US has diverted to cheese production, in contrast with just 11% during the period between 1953 and 1960.[63] Likewise, regional craft beer production in terms of total barrels produced has increased by over 300% from 2004 to 2016, while contract breweries have decreased by over 60%.[64] Consumer demand in the US will likely cause a major shift among producers, who will increasingly seek intellectual property protections more in line with a European model. However, they will most likely look to trademarks and similar branding options.

III
MICROBIOME, TRADITIONAL KNOWLEDGE, AND TRADE SECRECY

The burgeoning field of microbiome technologies offers a challenging context for traditional notions of intellectual property protection. Patents are often unavailable, with the US Patent and Trademark Office maintaining that a mixture of otherwise unaltered bacteria is patent ineligible as a "manifestation of laws of nature."[65] Moreover, GIs and trademarks are often unenforceable. However, trade secret law offers both a promising and perilous alternative route for protecting technologies associated with environmental nucleotide sequencing.

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[61] *See, e.g.*, Décret 2010-1441 du 22 novembre 2010 relatif à l'appellation d'origine contrôlée «Champagne» [Decree 2010-1441 of November 22, 2010 related to the controlled designation of origin "Champagne"]; Légifrance: Le Service Public de la Diffusion du Droit, Apr. 6, 2022; 2018 O.J. (C 132) 7, (product specification of "Parmegiano Reggiano," published in the *Official Journal of the European Union*).

[62] *See* INNOVATIONS, *supra* note 2; Sheikha, *supra* note 2.

[63] INT'L DAIRY FOODS ASS'N, DAIRY FACTS 4 (2003).

[64] *National Beer Sales & Production Data*, BREWERS ASS'N, https://www.brewersassociation.org/statistics-and-data/national-beer-stats/ (last visited Apr. 8, 2022).

[65] Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130 (1948).

A. The Microbiome as Traditional Knowledge

To the definitions of *terroir* provided above, there may be added the view according to which *terroir* is collective knowledge held by a community over generations. As a result, requirements such as time limitations and author attributions demanded by most intellectual property systems appear to be poorly suited for protecting *terroir*. In particular, the microbial components of *terroir* pose a special challenge for intellectual property doctrines, as many would characterize the assorted fungi and bacteria inhabiting traditional fermented foods as naturally occurring.[66] Fortunately, recent international initiatives have begun to emphasize the importance of protecting "traditional knowledge," either by grafting it onto conventional notions of intellectual property or by proposing *sui generis* systems by which local communities' knowledge can be protected.

1. Defining "Genetic Resources"

Local communities often live in close association with other species, using them in agriculture, medicine, craft, and religious or spiritual practices. As a result, communities often seek protection for so-called "genetic resources," especially in the face of increasing bioprospecting, which deprives them not only of components of their cultural heritage but also of the fair and equitable sharing of benefits derived from the increasingly industrial production of resources cultivated locally over generations.

International and national leaders struggle with defining protections for "genetic resources" in the context of traditional knowledge. The United Nations Conference on Environment and Development (more commonly referred to as the Rio Earth Summit) brought 178 nations together in Rio de Janeiro, Brazil in 1992. While the summit focused on the environmental and resource issues facing world economies, its most lasting effect with respect to intellectual property was arguably the signing of the Convention on Biological Diversity (CBD).[67] In addition to sounding a global call to conserve biodiversity and promote the sustainable use of biological resources, the CBD explicitly demands the fair and equitable sharing of benefits arising from the utilization of genetic resources.[68] The protocol currently has 105 parties (with the United States notably absent), 92 of which are signatories committed to implementing national-level benefit sharing policies.

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[66] *Id.*

[67] Convention on Biological Diversity, *opened for signature* June 5, 1992, 1760 U.N.T.S. 69 (entered into force Dec. 29, 1993), https://www.cbd.int/convention/text/.

[68] *Id.* at arts. 15, 16, 19.

Article 2 of the CBD defines "genetic material" as "any material of plant, animal, microbial or other origin containing functional units of heredity." Genetic materials include "genetic resources," which are defined as "genetic material of actual or potential value," and include isolated and/or sequences of DNA, RNA, and proteins.[69] Notably, human genetic resources do not fall within the scope of the CBD nor the Nagoya Protocol.[70] Though being an important first step toward protecting genetic resources, the CBD did not implement any formal language recognizing the rights of local communities, nor any that easily facilitated the integration of their knowledge within national and international intellectual property regimes.[71]

It would be another 18 years before further UN discussions took form as a supplementary text to the original CBD: The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization to the Convention on Biological Diversity, or simply the "Nagoya Protocol." The Nagoya Protocol establishes roles and mechanisms protecting traditional knowledge of genetic resources while also supporting the fair and equitable sharing of benefits for their utilization.[72]

Crucially, the Nagoya Protocol sets out clearer guidelines for the "utilization" of genetic resources, as defined in Article 2(c) as "research and development on the genetic and/or biochemical composition of genetic resources, including through the application of biotechnology as defined in Article 2 of the Convention."[73] This definition effectively expands the interpretation of genetic resources to all forms of biotechnology, which is also defined in Article 2(d) as "any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use." Interestingly, "derivatives"

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[69] *Id.* at art. 2.

[70] *See* Decision II/11, "Access to Genetic Resources," as published in Conference of the Parties to the Convention on Biological Diversity, *Report of the Second Meeting of the Conference of the Parties to the Convention on Biological Diversity*, p. 64, U.N. Doc. UNEP/CBD/COP/2/19 (Nov. 6-17, 1995); The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, *opened for signature* Feb. 2, 2011, U.N.T.S. A-30619 (entered into force Oct. 12, 2014), https://www.cbd.int/abs/text/ [hereinafter Nagoya Protocol].

[71] Libby Liggins, Māui Hudson & Jane Anderson, *Creating Space for Indigenous Perspectives on Access and Benefit-Sharing: Encouraging Researcher Use of the Local Contexts Notices*, 30 MOLECULAR ECOLOGY 2477, 2477 (2021).

[72] *Id. See also* Michael Heinrich et al., *Access and Benefit Sharing Under the Nagoya Protocol — Quo Vadis? Six Latin American Case Studies Assessing Opportunities and Risk*, 11 FRONTIERS PHARMACOLOGY 765, 776 (2020).

[73] Nagoya Protocol, *supra* note 70.

are further defined in Article 2(e) to include any naturally occurring biochemical compound, even if they do not contain "functional units of heredity."[74]

While Article 16 of the CBD recognizes the impact of intellectual property policy on access to benefit sharing, detailed mention of intellectual property is surprisingly absent from the Nagoya Protocol. Nonetheless, the Protocol does require signatories to formulate fair and non-arbitrary procedures for access to genetic resources, as well as guidelines when applying policy related to Free, Prior, and Informed Consent (FPIC) within the context of trade deals and permit applications.[75]

The microbiome is composed of the bacteria, archaea, fungi, viruses, and microscopic eukaryotes present in any given environment—groups of organisms rarely visible to the naked eye and consequently less readily imagined than goats or corn. Although such microbes contain genetic material, whether they are considered as genetic resources according to the Nagoya Protocol is somewhat unclear. Part of the uncertainty has to do with whether the Nagoya Protocol included digital sequence information, which includes digital sequences of DNA, RNA, proteins, metabolites, the epigenome, and so forth. Environmental DNA sequencing techniques, whereby all the microbes present in a single sample can be sequenced at once, are typically employed to identify organisms present in a microbiome. Once identified, the organism itself seems to fit easily within Nagoya's definition of "genetic material" (that is, "any material of plant, animal, microbial or other origin containing functional units of heredity").[76] More difficult, however, is the not uncommon occurrence of an unnamed and undescribed species whose presence in a microbiome is only represented by digital sequence information. This issue may be especially poignant in the context of traditional fermented products, as years of evolutionary divergence from "natural" source populations paired with a strongly-selective environment—for example, saline dried meat skin or very acidic balsamic vinegar—will often result in sequences that poorly match named sequences in preexisting databases. Nevertheless, once the key players in a microbiome are identified, their isolation and use are presumably encompassed by the same

[74] *Id.*

[75] U.N. Conference on Trade and Development, *The Convention on Biological Diversity and the Nagoya Protocol: Intellectual Property Implications*, 14-15, U.N. Doc. UNCTAD/DIAE/PCB/2014/3 (2014).

[76] Convention on Biological Diversity, *supra* note 67, at 3 (Article 2 defines the term "genetic material" as it is to be used for the purposes of the Convention on Biological Diversity, including use in the Nagoya Protocol).

definition of genetic material as when the definition is applied to the familiar non-microscopic animal or plant.

2. Defining "Traditional Knowledge"

"Traditional knowledge" is by necessity a general term given the diversity of Indigenous and local communities across the globe. It is typically defined as a body of knowledge collected and cultivated by a group of people across generations.[77] In the context of communities' living surroundings, traditional knowledge often includes a classification of organisms, observations about the local environment, and details on its stewardship.[78] Analogous to, yet distinct from, Western notions of science, traditional knowledge represents a unique body of knowledge that is often transmitted orally, compiled in qualitative terms, rooted in a community's social context, and collected.[79]

From an intellectual property point of view, traditional knowledge is defined by the World Intellectual Property Organization as "tradition-based literary, artistic or scientific works; performances; inventions; scientific discoveries; designs; marks, names and symbols; undisclosed information; and all other tradition-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields."[80] Knowledge may be considered "traditional" as long as, at its creation and use, it is alive as part of a community's cultural traditions; the term does not need to imply that the knowledge itself is ancient or fixed.[81]

Given accepted definitions of genetic resources and traditional knowledge, it is appropriate to consider the former as a subset of the latter, especially in the context of artisanal fermented products. The unique composition of organisms present in a microbiome goes hand in hand with the distinctive qualities of a fermented product. These qualities are the direct product of generations of a community managing and

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[77] Jacob Golan et al., *Intellectual Property Rights and Ethnobiology: An Update on Posey's Call to Action*, 39 ETHNOBIOLOGY 90, 104 (2019); Daniel Gervais, *Traditional Knowledge & Intellectual Property: A TRIPS-Compatible Approach*, 2005 MICH. STATE L. REV. 137, 140-41 (2005).

[78] Graham Dutfield, *TRIPS-Related Aspects of Traditional Knowledge*, 33 CASE W. RSRV. J. INT'L L. 233, 240 (2001).

[79] *Id.* at 241.

[80] WORLD INTELL. PROP. ORG., INTELLECTUAL PROPERTY NEEDS AND EXPECTATIONS OF TRADITIONAL KNOWLEDGE HOLDERS 25 (2001) ("'[T]radition-based' refers to knowledge systems, creations, innovations and cultural expressions which: have generally been transmitted from generation to generation; are generally regarded as pertaining to a particular people or its territory; and are constantly evolving in response to a changing environment.").

[81] Gervais, *supra* note 77, at 140.

selecting for favorable strains indirectly through collective observation, sharing, and building of communal knowledge. Properly understood, the fostering of a traditional microbiome is the very essence of traditional knowledge, no different from the transmission of knowledge on shamanism or midwifery from one generation to the next.

3. Traditional Knowledge as Trade Secret

Having argued that the microbiome should be viewed as a genetic resource, and as such can be reinterpreted as a form of traditional knowledge in the context of local communities, legal protection for the microbiome enters into sight. Trade secrets emerge as the most versatile option for protecting the naturally occurring yet meticulously cultivated microbiome found within local fermentation processes. Trade secrets appear as a sensible option in part due to their relatively less rigid requirements when compared to other forms of intellectual property protection: the information need not be novel or nonobvious, and even slight improvements to established methods or know-how qualify. Furthermore, a local community is not necessarily required to have commercialized the information, but merely to show potential economic value.[82]

More specifically, trade secret law functions without patent law's rigid requirements. The microbiome as traditional knowledge fails on multiple requirements of patentability: the microbiome is naturally occurring, despite local communities' cultivation of specific conditions, and consequently it fails the novelty requirement of patentability. Furthermore, as the local microbiome has been kept by many over generations, patent law's requirement that there be identifiable inventors could not be fulfilled.[83] Trade secrets, on the other hand, are well-suited for information that is intermutually held, whether by a corporation or a local community. Despite trade secret law applying only to relatively secret, rather than publicly available, information, communities are free to share information among themselves as well as operationalize the information with "outsiders," provided explicit understandings exist that the information is to remain a secret.[84] One seeming limitation is that, for example, Indigenous and local communities cannot point to contracts or other written instruments to demonstrate efforts to keep knowledge secret. However, "reasonable secrecy" is treated by courts as a flexible

[82] Jorge L. Contreras, *Genetic Property*, 105 GEO. L.J. 1, 43-44 (2016).

[83] Iraj Daizadeh et al., *A General Approach for Determining When to Patent, Publish, or Protect Information as a Trade Secret*, 20 NATURE BIOTECHNOLOGY 1053, 1053-54 (2002).

[84] Deepa Varadarajan, *A Trade Secret Approach to Protecting Traditional Knowledge*, 36 YALE J. INT'L L. 371, 397, 401, 405 (2011).

standard, and one that importantly relies on factual circumstances, including evidence of custom.[85]

Temporal limitations of exclusivity also render other forms of intellectual property inappropriate, as not only does the local microbiome require decades to develop, but traditional knowledge is also something to which a community often desires entitlement indefinitely. Trade secrecy operates indefinitely and is therefore well-suited for protecting inter-generational knowledge. Such indefinite protection also follows from the lack of formal registration for trade secrets, at least in the US. In contrast to patents—the application process for which is arduous and requires ample financial and technical resources—trade secrets are created simply by an entity keeping a given pool of information secret. Enforcement of the trade secret flows from misappropriation of the knowledge. For example, local Shoyu producers can informally maintain trade secrecy over the microbiome cultivated in their soybean fermentation vats; were a party to misappropriate an unauthorized culture of the vat microbiome, these producers could enforce trade secrecy rights over the microbiome.[86]

Despite its breadth and flexibility, trade secret law offers weaker exclusionary rights than, for example, patent law. In particular, the property entitlement that trade secrets offer extends only to improper obtainment of information, in contrast to other forms of intellectual property whose exclusionary attributes extend further.[87] Moreover, neither independent creation by another party nor reverse engineering are protected under trade secret law. In the context of the fermentation microbiome, several precautions can help mitigate these gaps in protection. First, limiting access to fermentation facilities obviously prevents non-traditional-knowledge-holders from sampling genetic material. Even though the microbiome may go hand in hand with the cultivated product—allowing parties to directly appropriate the microbiome from the product itself—this risk can be avoided through sterilization or pasteurization of fermented products prior to making them available to the public. Although sterilization and pasteurization do not completely prevent outside parties from identifying species present in the microbiome (for example, through environmental DNA sampling of dead cells), this process substantially reduces the ease with which the microbiome can be propagated and reproduced.[88] Furthermore,

[85] *See, e.g.*, 18 U.S.C. § 1839(3)(A)–(B); Robert G. Bone, *A New Look at Trade Secret Law: Doctrine in Search of Justification*, 86 CALIF. L. REV. 241, 277 n.161 (1998).

[86] *See, e.g.*, Nicholas A. Bokulich et al., *Indigenous Bacteria and Fungi Drive Traditional Kimoto Sake Fermentations*, 80 APPLIED ENV'T MICROBIOLOGY 5522 (2014).

[87] Varadarajan, *supra* note 84, at 397.

[88] Golan et al., *supra* note 77, at 90.

mere knowledge of which species are present is unlikely to enable full reproduction of the microbiome, as the unique environment and substrate on which fermenter microbes are cultivated will be unknown to potential usurpers.

CONCLUSION

The production of artisanal, small-batch fermented foods has expanded worldwide, highlighting critical issues of how best to identify and legally protect the microbial ecosystems that make them unique. However, traditional forms of intellectual property are poorly suited for protecting these microbial communities.

Instead, trade secrets provide the most practical and versatile means of addressing ownership of the microbiome of artisanal fermented foods. Moreover, the microbiome itself should be viewed as a genetic resource, understood in several contexts as a form of traditional knowledge. The ongoing global initiative to recognize traditional knowledge as the patrimony of local communities, deserving of some form of property entitlement—whether by existing intellectual property mechanisms or *sui generis* systems—suggests a general willingness of national and international governing bodies to recognize the microbial constituents of artisanal fermented products protectable as trade secrets. It is through trade secrets that the law can properly bridge the intersection of microbial diversity and the intellectual property therein, providing protection for the ever-expanding technology of artisanal fermented foods.