Life Sciences, Intellectual Property Regimes and Global Justice

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1.

General Introduction

Science has brought both great benefits and numerous hazards to humankind. It affects our social relations, comprising those nearby and the many we never get to see. Now, more than ever before, technology is influencing the way we live our daily lives. The shape and direction taken by science and the technologies developed in its wake are however something we can to a great extent control or at least attempt to steer with more or less success. A variety of incentives can align scientific progress with pre-established targets. Yet, increasingly scientific agendas are being shaped by market incentives. In order to make scientific research lucrative intellectual property rights are granted to those who meet certain criteria that are defined by law. Exclusive rights have aroused fierce controversies for innovation in such vital areas as the life sciences. In a world of extreme inequalities this way of "incentivizing" innovation is bound to clash with deeply rooted notions of justice.

Realizing that the direction science takes is something we can steer, creates a moral obligation to align the course of science more closely with the benefit of the larger global population. This demand however already reveals a normative position and as such, maintenance, deviation or intensification thereof becomes something that has to be justified. The liberties of some will clash with the rights of others.

Background of the research project

Whilst states leaders from all around the world gathered in 1994 to sign the Trade-related Aspects of Intellectual Property Rights Agreement, few realized the enormous consequences this will have on everyday life. The binding agreement made minimum intellectual property standards mandatory for all World Trade Organization member states. The agreement has strong power, as it is backed with an arbitration system to penalize non-compliers with trade sanctions. The fact that the protection of intellectual property rights is now effectively a worldwide system calls traditional justifications of intellectual property protection into question and raises new ethical issues, especially with regard to global justice. Another prominent trend in recent decades has been the progressive enlargement of the subject matter that can be brought under intellectual property protection. The domain of patentable subject matter, for example, has been extended to include gene sequences, cultured cell lines and

tissues, live organisms, computer programs and also (in the United States at least) new business methods. As intellectual property rights increasingly cover the strategic information-intensive assets of the new knowledge-based bioeconomy (like seeds, food, medicines and diagnostic tools), they become deeply implicated in the essential requirements for the sustenance and flourishing of human life.

The discussion on intellectual property in the life sciences and global justice has primarily concentrated on two issues: accessibility and availability of the resulting objects of innovative efforts.[1] Accessibility means in this context that innovations should be accessible to those who urgently need them. Availability is a term used to discuss the problem of a highly skewed allocation of research efforts, as exemplified in the well-known "10-90 gap" in pharmaceutical research, where no more than 10 per cent of the entire research effort is reportedly devoted to finding cures for diseases that afflict 90 per cent of the world's population. Similar gaps exist in other fields of research.

While it is acknowledged that innovators should be fairly remunerated, allowing access to only those who pay the established prices is controversial for such objects as vital medicines. After the successful eradication of such dreadful diseases as smallpox the scientific community finds itself under huge pressure to repeat earlier achievements by making medicines available for other diseases as well. The suffering of millions of people is not perceived anymore as an inevitable burden on daily life that we are not capable to curb. Similarly technological solutions are sought for countless other social problems, be it food security, pollution control or climate change mitigation and adaptation.[2]

Although those first two allocation problems – accessibility and availability – are far from solved, two further issues that are somewhat neglected in the discussion also deserve attention: the highly unequal distribution of intellectual property rights themselves and the manner those exclusive rights affect the practice of science.

The highly unequal distribution of intellectual property rights between the Global North and the Global South can be identified as the third distributive justice problem raised by intellectual property regimes.[3] Such extreme inequalities have a negative effect on multiple dimensions. First, the divide between technology receivers and technology producers widens, thus creating a situation where financial flows occur mostly one way: from the Global South to the Global North.[4] Second, people who regularly use the system are placed in a position of advantage due to their greater legal expertise on what is patentable and what is not. A number of institutions have used their legal expertise to

[1] cf. Pogge (2005)
[2] cf. Acharya et al. (2004)
[3] cf. DeCamp (2007)
[4] cf. De Schutter (2011)

acquire patents on foreign inventions that were not or insufficiently protected. This is a phenomenon that in the life sciences is widely known as biopiracy. Especially indigenous innovators are vulnerable to such abusive practices and thereby lose an opportunity to be recognized and rewarded for their creativity. Third, managing a vast patent portfolio gives companies some control over follow-up innovations. Newcomers are often in a position of disadvantage, as they may have to spend considerable funds in acquiring licenses. This is generally a problem for companies and research institutions with smaller budgets.[5] Patents may even discourage or stifle follow-on innovation, contrary to their official rationale.

Intellectual property has had also a strong effect on the practice of science. First, it has profoundly strengthened the belief that science can and should be self-financeable. This has a negative effect on all types of scientific work that cannot be protected by intellectual property, most prominently: rediscovery, much of indigenous innovation, fundamental research and incremental innovation. Second, favouring one type of scientific work over other forms implies that one has a greater societal value than the other. In many cases this has nothing to do with social utility – many individuals and communities who provide vital services to society are widely misrecognized for their work. Additionally, one has to keep in mind that most people do not have the resources to apply for intellectual property protection. Third, intellectual property demands that innovation offers products that are homogeneous, something that disfavours indigenous innovation and is a disincentive for the maintenance of agrobiodiversity.[6] Innovators who primarily produce a heterogeneous output are less attractive research partners to collaborate with.

Research questions

The vast problems and opportunities raised by the intellectual property regimes in the life sciences give rise to a number of questions. However, a major issue that is inadequately addressed in the discussion is the necessity to make research and technology development a more inclusive endeavour. Since this matter is worthy of more scholarly attention I have decided to make it central by building the following six main research questions around this topic. First, I deemed it necessary to offer a brief exposition of the main ethical arguments that justify access to innovation and demand that technological solutions that address the problems of the poor become available. An over-emphasis on access and availability made me however ponder a world where scientific participation possibilities are deliberatively left aside. This led to the formulation of the

[5] cf. Eppinger and Vladova (2013)

[6] On the problem of industrial agricultural innovation and genetic erosion, see De Schutter (2011)

second question. In the third question I articulate the main problems brought up by highly unequal formal research capacities distributions between the Global North and the Global South with a corresponding pattern in the allocation of intellectual property rights. To counter arguments coming from neoliberal quarters I found it necessary to criticize conventional methods to judge the quality and quantity of research outputs. Hence the fourth question. The fifth point I want to bring into discussion is a specific problem raised by the way intellectual property affects scientific practice: the fate of traditional knowledge. Much of traditional knowledge becomes lost by the lack of incentives to continue its development. The last question raised wraps up the thesis by evaluating amendment proposals.
Verbatim, the guiding research questions are:

1. *What are the main ethical theories that justify fairer access to innovation?* This question addresses the different theories used to justify access and availability of innovations for those in need.
2. *Should one consider scientific participation possibilities as a luxury to be left aside until subsistence rights for the great majority of people are secured?* Access to innovation and sufficient research attention (availability of solutions) can be justified under subsistence rights. Efforts to make science more inclusive are often left aside with the argument that subsistence rights take precedence.
3. *Should extreme inequalities in research capacities between the Global South and the Global North be fought even when the objects of innovation are made accessible worldwide?* Since inequalities in research capacities will unavoidably affect the allocation of exclusive rights, this question addresses the third distributive justice problem: the negative impact of highly unequal distribution of intellectual property rights.
4. *What are the benefits to be expected from research and innovation and how do we judge that the international system of science and technology is working properly?* Is the number of patents an appropriate metric for measuring innovative output? Different inventions that have the same function often vary strongly in terms of positive and negative side effects. How do we make sure that innovations with the most valuable externalities are made available to the poor?
5. *How can we secure the moral and material interests of indigenous innovators using the current intellectual property regimes?* Much of indigenous creative efforts are not patentable. Incentivizing indigenous innovation as a parallel system of innovation would make the current science and innovation practice (the earlier mentioned fourth issue) much more inclusive by facilitating the participation of those who currently are underrepresented.

6. *Is there, among the various proposals that have been brought forward to enhance the global justice of the international intellectual property and research system, any amendment proposal that should be clearly favoured?* An evaluation is needed to identify which amendment proposal best addresses the issues of access to and availability of objects of innovation, reduces the negative effects of highly unequal distribution of intellectual property rights and is conducive to good science and innovation practices.

Having introduced the questions, I will move on by explaining the research methodology used in this thesis.

Research methodology

Insights to answer the research questions were gained by an extensive study of literature. In the selection of material I made sure that works from all relevant disciplines were included. Most of the analysed literature comes from philosophy, political science, law, economics and anthropology. To a lesser extent literature from disciplines such as life sciences, development studies, business and innovation management, history of science and technology, public health and engineering was also examined.

While this is a philosophical thesis, I also used methods that are not commonly employed in the discipline. The thesis gained in strength by including the methods of empirical philosophy, a practice that has become fairly widespread in the Netherlands: conversations with stakeholders and critical analysis of empirical data. One of the highlights here was the organization of a networking conference in Brussels September 2011.[7] Michiel Korthals and I organized the conference with substantial support from the Centre for Society and the Life Sciences. We brought together specialists from a diverse range of disciplines working in academia, public sector, industry and NGOs. This exceptional environment fostered a high level of discussions dealing with global justice concerns raised by the intellectual property regimes in the life sciences. There was ample room to debate ideas and concerns and this opportunity was well used. I gained immensely from discussions with the participants, some of which commented on later developed papers. Thomas Pogge's work also was exemplary in showing how to harness a critical analysis of empirical data for the purpose of ethical assessment.

My involvement in several research environments gave substantial material input to the subject of investigation. Based at Wageningen University, I

[7] Korthals and Timmermann (2012) [here reproduced as Chapter 4]

participated in the interdisciplinary "Commons Seminar" and in a series of guest lectures, meetings and seminars. The university's focus on agriculture and international development gave me countless opportunities to gain new insights and rectify false assumptions. Being also a member of interuniversity research group, the Centre for Society and the Life Sciences allowed me to discuss topics with people working primarily on health-related issues. A two-month research stay at the Brocher Foundation gave me the opportunity to strengthen the knowledge gained through extensive interdisciplinary discussions with researchers from different parts of the world.

Overview of the thesis

After this general introduction, the *second chapter* commences by setting out the major arguments for making objects of innovation accessible and directing research attention to make technological solutions for the global poor available. The research question here answered is: *What are the main ethical theories that justify fairer access to innovation?* After that I state what makes life sciences different to other fields of knowledge.

The *third chapter* is the main theoretical chapter. A philosophical interpretation of a segment of article 27 of the Universal Declaration of Human Rights serves as the centrepiece of this chapter that introduces the concept of global justice used throughout the thesis. The aim of this interpretative analysis is to give an extensive answer to the second research question: *Should one consider scientific participation possibilities as a luxury to be left aside until subsistence rights for the great majority of people are secured?* Here the consequences of prioritizing any of the two elements of this article, i.e. the possibility to share in scientific advancement or to benefit from access to and availability of objects of innovation, are analysed in regard to global justice. This chapter also addresses partly the third research question: *Should extreme inequalities in research capacities between the Global South and the Global North be fought even when the objects of innovation are made accessible worldwide?* Huge inequalities in research capacities are condemned with the introduction of the concept of dependency: the situation where one party is always the one "saving" the other through technological aid.

In the *fourth chapter* we move from discussing the theoretical framework to offering a report representing the current state of the debate. This chapter reports the outcomes of the "Network Conference on Ethical and Social Aspects of Intellectual Property Rights – Agrifood and Health" held in Brussels, September 2011 and concludes by offering a philosophical reflection on the debate. This chapter turns around two questions: what are the main problems of

the current intellectual property regimes? And, what can society do to mend them? It also provides some accounts on the negative effects raised by the high concentration of intellectual property rights among a few major multinational companies.

After the theoretical framework and the current state of the debate have been presented, we continue with the analysis of three proposals that seek to alleviate the negative effects of current intellectual property regimes. Those proposals are the Access to Knowledge movement, the Health Impact Fund and open innovation models. In order to offer a critical perspective, each proposal is discussed in relation to a specific problem field: access to medicines, the promotion of climate-friendly technologies and the issue of traditional knowledge.

Chapter 5. The access to knowledge movement is discussed by using the most prominent conflicting issue with the patent system: the need to make medicines accessible for the poor and stimulate research on neglected diseases. The chapter offers a historical overview of the debate since the early 1980s. The landmarks of the debate are narrated by addressing the question: What initiatives have been taken in making medicines available and accessible during the last thirty years? The chapter also evaluates the strengths and weaknesses of these various initiatives.

Chapter 6. Focussing on the latest version of the Health Impact Fund proposal, we criticise the hard prioritarian position defended by Thomas Pogge and see it as a major hurdle for ensuring scientific participation possibilities for the global poor. As climate-friendly technologies do not necessarily have to be rooted in industrial innovation to meet their target, excluding the stimulation of grassroots innovation becomes even harder to justify. Grassroots innovators are developing many methods that can be useful to reduce the carbon footprint in agriculture – stimulating them would not only do good to the planet but also support a more inclusive innovation system. This chapter responds to the third and fourth research question: *Should extreme inequalities in research capacities between the Global South and the Global North be fought even when the objects of innovation are made accessible worldwide?* And: *What are the benefits to be expected from research and innovation and how do we judge that the international system of science and technology is working properly?* A special emphasis on the latter question is given by criticizing the use of a unique metric (quality-adjusted life years) to measure the positive impact of a whole group of innovations. Widening the circle of innovators is suggested as a strategy to make sure that inventions are brought up who have valuable externalities. I also critically discuss the widely used metric of the number of patents as a purportedly reliable measure of innovative output.

Chapter 7. Open innovation is not the ideal solution to secure the material interests of traditional knowledge holders. Using a dynamic concept of traditional knowledge, that encompasses all the innovation done by small-scale farmers and indigenous communities, I argue that worse than seeing one's profits opportunities forgo is to see one's innovative efforts go to waste. Open innovation models allow users to secure their moral interests as recognized by law, i.e. the right to attribution of authorship and the possibility of having control over the integrity of one's work. In addition to that, I argue that another fundamental moral interest that is not protected by law can be secured with the use of open innovation models: that one's invention is fairly evaluated in terms of its capacity to promote societal welfare. Those are the central arguments that provide an answer to the fifth research question: *How can we secure the moral and material interests of indigenous innovators using the current intellectual property regimes?*

The final part of the thesis re-examines the insights gained earlier and tries to see how far apart they are from positions defended by groups involved in the intellectual property and global justice advocacy.

The aim of the *eighth chapter* is to wrap up the thesis by analysing the question *Is there, among the various proposals that have been brought forward to enhance the global justice of the international intellectual property and research system, any amendment proposal that should be clearly favoured?* Here an assessment of six major proposals to alleviate the negative effects of the current intellectual property regimes is made. Those include the three analysed proposals: the Health Impact Fund, the Access to Knowledge movement and open innovation models. Three additional proposals were added to make this study more extensive: prize systems (including advanced market commitments), South-South partnerships and compulsory licenses.

Finally, *Chapter 9* will offer some concluding remarks. Here I will briefly discuss the answers to the research questions stated at the beginning of the thesis.

2.

Limiting and facilitating access to innovations in medicine and agriculture: a brief exposition of the ethical arguments

This chapter builds up on material that is published in:

Cristian Timmermann (2013): "Justifying pro-poor innovation in the life sciences: a brief overview of the ethical landscape." In *The ethics of consumption*, edited by Helena Röcklinsberg and Per Sandin, 341-346. Wageningen: Wageningen Academic Publishers.

Abstract

An idea is a public good. The use of an idea by one person does not hinder others to benefit from the same idea. However in order to generate new life-saving or otherwise socially useful ideas, e.g. inventions in the life sciences, a huge amount of human and material resources are needed. Powerful, but highly criticized tools to speed up the rate of innovation are exclusive rights, most prominently the use of patents and plant breeders' rights. Exclusive rights leave by nature a number of people empty-handed, with starvation, stuntedness, prevalence of disease and death as preventable and everyday consequences. To stimulate a human rights compatible use of exclusive rights a wide range of moral frameworks have been developed for the ethical assessment of current practices. Most prominent in the debate are theories building on (1) utilitarian calculations of weighing benefits with Peter Singer as a prominent advocate, (2) Pogge's vindication of compensatory duties for institutional harms, (3) a comprehensive analysis on how the current innovation incentive system fails to secure human rights and human capabilities and lastly (4) showing how the status quo nurtures misrecognition. With help of those theories modest adjustments as well as a thorough restructuring of the innovation incentive system can be justified. Those theories have the Herculean task of restraining well-established ideas supporting the permissibility of a reckless use of property rights that are deeply anchored in the property law discourse. Life sciences raise a range of special problems when justifying pro-poor innovation. Healthy people living in a society with a good sanitary infrastructure need far less resources to tackle the same health problems than people in places with a poor infrastructure.

Keywords: global justice, intellectual property, benefiting from science, human rights

One of the most fundamental norms in human rights law is the principle of progressive realization of all human rights.[8] Perhaps the most incontrovertible and shared standard to measure progress towards achieving this goal is life expectancy. Since the 1950ies a substantial rise in life expectancy can be observed all around the world. Contributions to this remarkable achievement come from a wide range of quarters; however a crucial role can be attributed to the rapid development of the life sciences.
At the end of the 20th century, for the first time in decades, not war but disease was responsible for lowering the average life expectancy in a number of countries.[9] The AIDS pandemic has had such a devastating death toll that it is reflected in a considerable reduction of the national average life expectancy of various countries. In addition, hunger and malnutrition are endemic; many experts prognosticate that climate change will impose a further threat to future food security. The state of some countries is so dire that the term "developing country" does not fit current realities any more. For many countries the label "retrogressive societies" would be more suitable to describe the actual situation.

The reduction of average life expectancy in many countries is an undisputable sign that one of the most sacred principles of human rights law, the principle of progressive realization, is being violated, demanding urgent response. All disciplines that are capable of delivering solutions incur a moral obligation to contribute to the alleviation of these problems. As science and technology development has in the past been able to advance human welfare considerably, it cannot exempt itself from the obligation to continue to do so in the present and the future.

It has however become customary to incentivize research and development by granting temporary exclusive rights to innovators. Many vital medicines and innovations in agriculture are subject to those rights and sold at higher than production prices to allow innovators to recoup research and development costs. We will therefore examine the main arguments that defend temporary exclusivity in the first section. Since innovation in the life sciences brings about a

[8] International Covenant on Economic, Social and Cultural Rights (1966), art. 2.1. See also UN Committee on Economic, Social and Cultural Rights (1990)
[9] cf. World Health Organization (2012)

series of extra considerations that need to be addressed, we will briefly list some of these issues in the second part. The third section will analyse the ethical theories used to bring research agendas more in line with the needs of the poor.

Justifications for temporary exclusivity

The function of intellectual property rights is primarily instrumental: it is a societal tool to stimulate innovation. Depending upon the type of creative work a variety of incentive mechanisms have been institutionalized. Examples thereof are copyright, patents, geographic indications and plant breeders' rights. In addition, trademarks are protected to help manufacturers maintain a clientele by providing products that retain certain quality standards and characteristics. Trade secret laws set some limitations on how far employees of one company may share their acquired knowledge with competitors.

One of the most prominent forms of intellectual property are patents. Having its present-day origin in the second half of the fifteenth century in Venice, patents were from the beginning conceived as a public/private bargain.[10] Since its early days, patents were only granted to inventions that were both new and useful. The exclusive rights were also temporary and alienable, and the state retained a right to compulsory licence. Interesting is that early patent law required patent holders to use the patent (a basic working requirement) in order to retain its validity.[11] Only this last element has not been taken over by contemporary patent law. Holders of exclusive rights are nowadays in no way required to make their inventions or work publicly available and can up to a certain extent hinder third parties to make such efforts.[12]
Granting temporary exclusive rights to innovators allows them to recoup research and development costs, provided those costs were reasonable and the product developed can be sold and finds a large enough market. Inventors who can convincingly persuade investors to advance research expenses are given a tool to secure returns to the investment and so be able to undertake their research. Those who have made a financial gain by making use of exclusive rights can, if they so wish, reinvest their capital in further research activities.

[10] May (2007)
[11] idem., referring to Mandich (1948)
[12] Patents have nowadays also new uses. A so-called destructive use of patents occurs when patent holders use their exclusive rights to hinder innovation and the diffusion of improved competing products. The goal thereof is often to keep a high demand on older profitable products, on new uses of patents see Schneider (2010) pp. 125ff.

The establishment of the Trade-related Aspects of Intellectual Property Rights Agreement[13] in 1994 introduced a system for the global enforcement of intellectual property rights with sanction possibilities for noncompliance. However, similarly to its predecessors in national laws, rights are not absolute. The idea of compulsory licenses is affirmed in the TRIPS agreement. The drafters of the TRIPS agreement as well as the signatories of the Doha Declaration acknowledge that intellectual property rights can clash with higher societal goals, most notoriously public health needs. Here signatories agreed that in case of conflict, urgent public health interests supersede private interests.[14]

The globalization of intellectual property rights was not the only event that changed the legal landscape of exclusive rights during the last century. Since the second half of last century, exclusive rights are less seen as privileges and more perceived as genuine property entitlements.[15] This change in terminology is not a minor one, since property entitlements are far more deeply anchored in society. Opponents of exclusive rights do now not only have to fight entitlements that are conceived mainly as instrumental, but also rights that terminologically fall under the umbrella of property rights. Violations of the latter right are generally perceived as less acceptable. There are two major philosophical traditions that justify ownership of property by basing the encompassed rights on natural law and personality ties respectively.

Natural rights. Following one interpretation of Locke's material property theory, modern legal scholars have translated the notion of having a natural right to enjoy the fruits of one's labour directly into having a natural right to intellectual property.[16] According to this theory there is nothing we are more entitled to call our own than our own bodies. Since we mix labour, something that is inherently part of our own due to the indispensable bond to our bodies, with the material we work with, we gain an entitlement to call the thing we mix labour with our own.[17] This is subject to two provisos: the resources we mix labour with are unowned and there is enough and as good left for others.[18] Retaining ownership

[13] Trade-related Aspects of Intellectual Property Rights Agreement (1994), hereinafter TRIPS
[14] cf. Timmermann and Belt (2013) pp. 51ff. [here reproduced as Chapter 5]
[15] Intellectual property as an umbrella concept dates back to the 1950s. Copyright has been understood as property for a far longer time, see Hughes (2011)
[16] For the complexity of this transition, see Hughes (1988) pp. 296-329 and Drahos (1996) pp. 41-72
[17] Locke (1689) book ii, §27-28 and cf. Widerquist (2010) pp. 6f
[18] Locke (1689) book ii, §27-36

titles is however still subject to a third proviso: non-wastage has to be avoided.[19] Similarly to in early Venetian patent law, the idea that ownership titles should only cover objects that are used is present in Lockean property theories.[20]
When dealing with tangibles, it makes sense to allow ownership, since harvesting the fruits of one's labour is hardly possible without having control of the object. Intangible objects are different however, the object itself is not consumable, i.e. it can be enjoyed by a number of people at the same time without diminishing it.[21] Exclusive rights on the object are not necessary to enjoy the fruits of one's intellectual labour, at least when considering individual use. This changes however, if under enjoying the fruit's of our labour we also include charging monopoly rents from the use of the invented object. Recognizing property makes charging rents possible, however here we may undermine one of the main functions of property: to incentivize mixing labour with the owned object (i.e. improving the asset). As soon as the practice of rent-seeking is accepted, it becomes clear that the idea of abuse of rights has to be specified.[22] The natural right tradition has close ties to the notion of desert, making issues of proportionality between benefiting from one's own labour and gaining from the efforts of others mandatory. Exorbitant rent-seeking may disincentivize potential labourers to work on further improving the asset.

Personality theories. According to Hegelian personality theories we as individuals own our character traits, talents and feelings.[23] While constructing or creating new objects we are expressing ourselves and certain traits of our personality become attached to the developed objects. Having control over how one's person is perceived requires therefore also a certain power over the objects one has brought into existence. Property ownership is one way to have such control. According to Hegel the recognition and possession of property contribute to the extension of one's personality.[24] Exclusion would be thus justified on the grounds that one sees the desired image of one's personality in jeopardy. When it becomes possible to limit the diffusion of agricultural innovation or block access to essential medicines solely on these grounds, we will have to seriously

[19] In the realm of intangible property we may ponder if the "recklessly suboptimal use of resources" should be understood as wastage, see Attas (2008) p. 47
[20] The introduction of money however makes the accumulation of wealth possible without spoilage. There are strong differences in opinion about the ultimate implications of the introduction of money for Lockean property theories, see Uberti (2013)
[21] cf. Attas (2008), pp. 47ff
[22] cf. Donselaar (2009)
[23] cf. Moore (2011)
[24] cf. Hughes (1988)

question the social value of securing this interest. This type of reasoning becomes difficult to defend for objects other than artistic and literary creations.

Special challenges raised by the life sciences

Privatizing knowledge in the life sciences raises a number of additional concerns. In part, exclusive rights hinder access to objects of innovation that could secure such essential rights as the human rights to health and food. But here the problems do not stop: having exclusive rights on specific uses of genetic resources may hamper innovation if patent holders pursue a restrictive licensing behaviour. Although the principle of patents is to make knowledge more accessible by giving patent holders greater control over the knowledge they claim as their own, there are repeated cases where this is not the outcome, as mentioned earlier. Through the use of temporary exclusive rights many inventions are made inaccessible regardless of what consumers are willing to pay. Compulsory licenses are the lawmaker's remedy for such cases, but in practice they are hardly ever pursued. The public interest has to be substantial for such type of licensing to be considered a viable option.

Impossibility to invent around. A general additional advantage of patents is that once an invention proves profitable a number of people will be motivated in offering similar solutions. Those who do not want to acquire a license from the patent holder will attempt to provide a technical innovation that has comparable functions but is distinguishable enough to qualify as a new invention and thus also be patentable. The advantage hereof for society is that the original monopoly high prices are in practice reduced by the proliferation of competing products. This competition incentivizes the original inventor to increase the sophistication of her original product and thus further increases competition, which again brings an advantage to society.
Patents that are closely tied to uses of biological material impede competing innovators to offer similar solutions as the requirement to obtain a license become unavoidable due to the uniqueness of genetic material.

Patent thickets. Some objects of innovations are covered by a number of patents. When the patents have different owners with diverging conceptions of the market and scientific value of each patent, we often encounter so-called "patent thickets". A textbook example hereof is the "golden rice" case. Licenses for nearly 70 patents had to be cleared out before the genetically modified rice could be marketed.[25]

[25] cf. van den Belt (2003) pp. 231-237

Temporality of delays. Particularly in the life sciences what for some counts as a temporary exclusion means to many permanent exclusion. Treatment that comes late is often inefficacious. Late access to medicines or vaccines may mean death or the suffering of a disease. As far as public health and food security is concerned, it is often suboptimal to have one group having early access to an innovation and another second group to have access only after generics become available. The eradication of pathogens demands widespread simultaneous action.

Biodiversity. In order to be able to apply for patents or plant breeders' rights protection the object of innovation has to be stable and uniform. Small farmers who engage in seed exchange practices identify and select a number of plant varieties according to specific traits. This type of intellectual work can generally not be protected through the use of intellectual property.[26] There are thus incentives to innovate in such a way that one has a stable and uniform output. As a further problem, the selling of protected seed varieties is lucrative, economically rational sales practices will include a number of outreach programmes and lobbying activities to motivate farmers to use commercial seed varieties. This brings genetic erosion with it, as much of agrobiodiversity gets lost when farmers discontinue to use traditional seeds.[27]
Biodiversity has also its negative counterpart, not only useful plants have a heterogeneous genetic makeup, but also pathogens. The same active ingredient that combats a pathogen prevalent in the developed world does sometimes not have the same efficacy with pathogens prevalent in the developing world.[28]

Living material reacts to its environment. One of the arguments that justify the existence of patents is that inventors disclose a huge amount of information in patent documents and that this information becomes part of the public domain once the patent expires. This trade-off is often called the "patent bargain". Patent databases are therefore seen as a huge source of knowledge. In the legal, philosophical and economic discourse it is assumed that knowledge is a good of non-rivalrous consumption, meaning that knowledge can be enjoyed by as many people and for as long as desired without diminishing it.[29] Living organisms are however not stable. Climate change makes many crops useless. Organisms that are combated often develop resistance to the agent with whom it fights. The consequence of the latter is that many herbicides, antibiotics, antifungi and

[26] In some geographic areas this type of work might be incentivized through protected geographic indications, but this will be limited to a small number of products.
[27] cf. De Schutter (2011)
[28] One example is the vaccine developed to fight the human papillomavirus, see Timmermann and Belt (2013) fn. 46 [here reproduced as Chapter 5]
[29] cf. Stiglitz (2008)

pesticides become ineffective over time. For whoever holds a patent for such type of objects, profit-maximization would dictate to either sell it to a small number of high-paying customers or to overexploit the active agent without regard for the development of resistance. In case of overexploitation, the active agent may become useless once temporary exclusive rights elapse. The public will not have an effective generic product available and be obliged to pay for a newly developed patented product. An incentive mechanism to conserve those resources is missing.[30] If those resources are not conserved the public misses out its share of the patent bargain: valuable knowledge entering the public domain.

Self-multiplication. Unlike in other fields, some innovations in biotechnology have the ability to self-reproduce. A prominent case is genetically-modified plants that have genes inserted whose use is protected by patents. Who is responsible for the reproductive behaviour of plants protected by exclusive rights? In the case of a plant variety that has a patented gene sequence a much-debated court case illustrates the complexities involved. The *Monsanto Canada Inc. v. Schmeiser* case has created a severe turmoil by deciding in favour of the pharmaceutical company.[31] Even by taking proper measures, it is difficult to avoid genetic contamination.

Speedy sharing of data and samples in global emergencies. The impossibility to seal national borders hermetically demand that we have responsive mechanisms to enable the swift sharing of data and samples concerning public health and food security threats. The world we now live in hosts many more people than ever before. Overcrowded prisons are already a public health hazard.[32] In so-called "hotspots" we encounter an extremely high population density living closely together with animals. As those areas are situated mostly in tropical regions, this provides ideal conditions for the emergence of new pathogens.[33] An additional threat for the containment of diseases is the high mobility of people globally, which leads to the intercontinental propagation of diseases within hours.[34]

Intellectual property has a negative effect on the spirit of free sharing. Countries who voluntarily shared samples find themselves paying huge sums of money for

[30] see generally Outterson (2005)
[31] cf. van den Belt (2009) p. 172ff.
[32] cf. Møller et al. (2007), esp. pp. 43-83
[33] Some densely populated areas in the developed world also qualify as "hotspots", see Jones et al. (2008)
[34] A duty to share data related to public health emergencies is defended by Langat et al. (2011)

medication that could not have been developed without their contribution.[35] This is felt as an injustice that demotivates people to continue to share samples without clear agreements securing returns.

Biosafety. Inventions rarely affect only technology producers and technology users, but usually also society at large. In the case those effects are negative, efforts have to be made to contain any undesired side-effects. Being able to exclusively exploit a technology in a given timeframe can make taking risks (or being risk adverse) lucrative. Not having basic needs secured makes people more willing to take risks. When research options that are affordable and far better than nothing are abandoned because they do not meet the safety standards of the Global North, harmonization of safety standards becomes a justice problem.
Biosafety regulation also affects the abovementioned patent bargain. Data submitted to biosafety regulation agencies is increasingly considered a private good [36] and thus rarely accessible for independent testing by non-public institutions. Once exclusive rights elapse, a much wider range of stakeholders examines the submitted data. Many pesticides that were protected by exclusive rights thus become prohibited by the time generic versions can be freely manufactured because of more extensive biosafety control. Farmers are thus compelled to buy new products that are covered by patent rights.

Incentivizing innovation and cosmopolitan conceptions of justice

Hardly anyone would nowadays endorse Leibniz' statement that we live in the best of all possible worlds, at least when taking political realities as constitutive. There is ample room to make this world a better place. First, we live in a world of extreme inequalities. To take an example, in 1999 the total gross domestic product of all low income countries added to 166,8 billion dollars shared among a population of 636 million people.[37] At the same time the 279 million people living in the United States spent 116,2 billion dollars on alcohol alone.[38] There are enough resources in the world to eradicate severe poverty. In relation to hunger, it is long known, that misdistribution and not an absolute food shortage is the main cause of famine. [39] Second, many of the global institutional arrangements predominantly benefit the richer countries of the world and come

[35] In 2007 Indonesia stopped providing flu samples because the government feared that industry in the developed world would develop vaccines without providing any returns for the country, see The Royal Society (2012) p. 18
[36] cf. FAO & WHO (2010) pp. 24f.
[37] Data taken from databank.worldbank.org
[38] Foster et al. (2003), population number taken from databank.worldbank.org
[39] Sen (1981)

at a significant concrete and opportunity cost for the poor.[40] Third, science and technology could be incentivized in a way that would far better benefit those with the most urgent needs. The life sciences, being tightly linked to food security and global health, have a gigantic mission in developing solutions for those in need.

Reducing suffering around the world to less disgraceful levels is a Herculean task. We currently face an annual death toll of 18 million people worldwide from poverty-related causes that is largely avoidable.[41] It is estimated that 12,5% of the world population is undernourished.[42] Vitamin and mineral deficiencies are causing irreparable damages to the health of hundreds of millions, hindering full brain development and causing blindness.[43] All those facts are not new, and society as a whole has developed a certain apathy to see behind those evils merely numbers.

An increased global population has also made it mandatory to live more sustainable lifestyles. Climate change is threatening future food security.[44] Rising average temperatures enlarge the area where tropical diseases are prevalent. As those diseases are neglected in pharmaceutical research we will be confronted with a severe global health problem. Pollution is affecting many areas in the world with severe effects on public health.

Even after acknowledging that tackling those problems could take more than a generation of well-intentioned people, we can still retain a glimpse of optimism and recall some of the remarkable achievements humankind made with the help of life sciences.[45] Over the past 50 years yields in agriculture have been increased by over 130%.[46] The world is now feeding many more people than at any time in history.[47] Some deadly diseases, such as smallpox are considered eradicated,[48] polio is close to be completely eradicated and others are not a threat to life anymore.[49]

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[40] cf. Pogge (2008b, 2010b)

[41] Pogge (2008b), p. 2

[42] FAO WFP and IFAD (2012) p. 8

[43] Over 30% of the world population suffers micronutrient deficiencies, see idem p. 23

[44] Cline (2007). On problems making agricultural innovation accessible for climate change adaptation, see Timmermann et al. (2010).

[45] Systematic observations and experimentations made by people living in indigenous communities are also considered scientific unless specified otherwise.

[46] Baulcombe et al. (2009)

[47] De Schutter (2011), p. 305

[48] Flory and Kitcher (2004) p. 42

[49] Details about the current program of worldwide polio eradication can be found under http://www.polioeradication.org/

The current institutional order is designed in such a way, that the mere participation in it makes people responsible of harming others.[50] By paying taxes and buying new products we sustain a market economy that has substantial negative effects on the poor. Nonetheless, those who come up with technological innovations are not the only ones maintaining such regimes nor can they be fully blamed for the harms the poor are facing. Out of fairness, they should not be the only ones burdened with addressing global welfare problems. Further, global poverty is not a problem caused by a single generation.
Important is to mention that it is essential to human nature to improve one's living situation and we also recognize this as a human right.[51] Making a single generation pay for all the negligence of past generations also raises issues of justice. Over-burdening one generation will limit their possibility to improve their own situation.

Weighing benefits. People who are below a certain welfare threshold are much easier to satisfy than those who already live in prosperity. To take a very basic example: giving one euro to the person earning a hundred euros a day will not significantly enhance her well-being. On the other side, giving the same euro to one of the many people who earns one euro a day will significantly help her. This is reason enough to prefer the latter person as a recipient for most utilitarians.[52] Maximizing global welfare would require distributing resources to those who can convert them in welfare more efficiently. People who are in severe distress can already be helped with minor attentions. Having reached a threshold of welfare, people become increasingly less efficient in transforming resources into happiness.
Transferring this principle to the subject of innovation, a thinker like Peter Singer would condemn the situation where research efforts are spent to produce an additional shaving cream for an already large menu of product choices, while diseases that afflict the lives of millions of people receive hardly any scientific attention. A situation where 90% of the global resources are spent in addressing the health problems of 10% of the world population becomes unacceptable, as it is a highly inefficient form of increasing aggregated global welfare.[53]

Compensatory duties. Our global trade regimes, especially the TRIPS agreement, disproportionally benefit the developed world while adding significant disadvantages for the poor. The democratic legitimacy of the TRIPS agreement has been severely criticized. The negotiation documents were so complex that

[50] cf. Pogge (2008b)
[51] UDHR, art. 11.1
[52] see generally for this type of reasoning Singer (1993)
[53] cf. Drugs for Neglected Diseases Working Group (2001)

they could hardly be analysed by countries lacking strong legal expertise.[54] With this treaty, Pogge argues, developed countries have made themselves guilty of imposing a harmful regime on others, thus violating the negative duty not to inflict harm. Continuing with politics as usual demands from us compensatory duties. Therefore we are obliged to establish institutions whose positive effects outweigh the negative effects caused by existing institutions. Thomas Pogge's most well-known example of such type of institutions is the Health Impact Fund. This proposal seeks to collect sufficient funds to remunerate pharmaceutical companies through a mechanism that maximizes the quality-adjusted life years of newly developed medicines. Through this fund accessibility and availability of medicines could be improved for the poor.
A similar line of thinking is prevalent in climate change negotiations. Harming others through carbon emissions is seen as inevitable. Nevertheless harming without compensating is judged as worse than harming while compensating. The transfer of technology is often presented and demanded as a form of compensation.

Basic rights. Before being able to enjoy a wider set of liberties it is necessary to have some basic needs met. Subsistence, security and liberty are all elements that fall under the category of basic rights.[55] Entitlements such as freedom from hunger and disease are examples of those rights. The basic rights doctrine aims at securing subsistence needs at a very elemental level, standards well below thresholds aimed by the International Bill of Rights[56]. While freedom from hunger is targeted by the basic rights doctrine, the International Covenant on Social, Economic and Cultural Rights article 12.1 seeks to guarantee not only a freedom from hunger, but also a right to adequate food. An official comment on the right to adequate food states explicitly that this right shall "not be interpreted in a narrow or restrictive sense which equates it with a minimum package of calories, proteins and other specific nutrients"[57]. This comment states that cultural and consumer acceptability should be taken into consideration.[58] Similarly the right to health is also not interpreted as freedom from disease, but as the right to the highest attainable standard of physical and mental health.[59]

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[54] cf. Drahos and Braithwaite (2003), pp. esp. 133-149 and Pogge (2008b) pp. 1-32
[55] cf. Shue (1996) p. 9. However Henry Shue's approach is distinctive, since he considers a right to participation also as a basic right, see idem pp. 65-87.
[56] As commonplace in the literature, I will use the term International Bill of Rights to encompass the Universal Declaration of Human Rights (1948), the International Covenant on Civil and Political Rights (1966) and the International Covenant of Economic, Social and Cultural Rights (1966).
[57] UN Committee on Economic, Social and Cultural Rights (1999) § 6
[58] idem § 11
[59] cf. UN Committee on Economic, Social and Cultural Rights (2000)

A person can start to regularly enjoy other rights once her basic rights are considered secured. The basic rights doctrine seeks to secure the fundamental freedoms and entitlements for a person to be able to play a constructive role in society, without taking into consideration if the role played is the one the individual had in mind or wishes to continue to play. Important is here that the individual is physically able to undertake this function. However, limiting duties to safeguard only such basic necessities is strongly criticized. We do not need to abide by such extreme positions. In relation to food Amartya Sen has demonstrated that not scarcity but misdistribution is the principal cause of famine.[60] There are enough resources to considerably expand the freedoms people can pursue.

As far as innovation is concerned, the basic rights doctrine is a powerful tool to argue that access to some innovations takes precedence over the material interests of innovators. There are however some limitations. The link between the object of innovation and the intended outcome has to be strong, e.g. as far as health is concerned a medicine has to be crucial to recover from a disease. Objects that would considerably improve living conditions but are not vital for subsistence would still have to be balanced with other rights and interests according to this doctrine. As long as an object of innovation is necessary to ensure subsistence society can make claims on it, this counts also for objects that become available in the future. The World Health Organization, working with a concept of essential medicines, still demands access to new medicines and repeatedly states the need for further research. The Organization constantly reviews its list, taking into consideration the state of knowledge and innovation as well as the propagation of pathogens and disorders.[61]

Human rights and capabilities. The human rights discourse and the capabilities approach are interested in securing considerably more than just subsistence needs and freedom from repression. The two approaches have some differences, but offering opportunities to develop for people and communities is central in both discourses.[62] Development is understood in terms of human flourishing and this in multiple dimensions. People should also have the opportunities to participate in scientific and cultural life, benefit from the advancement of science, express themselves freely, enjoy leisure time, have a say on matters that affect their lives, among others. When addressing such an ample catalogue of rights, the opportunities innovation has to secure these rights will also be much larger. Access to many more objects can be claimed in virtue of their ability to enhance full human functioning.

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[60] Sen (1981)

[61] cf. WHO Expert Committee on the Selection Use of Essential Medicines (2012)

[62] cf. Nussbaum (1997)

A wider catalogue of rights that have to be pursued as a whole also enlists science to fulfilling many more tasks. It demands solutions for the problems that afflict the needy.[63]

Living in a world where science and technology play such an enormous role also creates an ethical obligation to make science and the development of technologies a more inclusive endeavour. There are a series of arguments to justify openness. Helping others by developing products with the use of one's intellect can be seen as a central human capability.[64] Participating in such endeavours allows people to get appropriate knowledge to judge those projects and assess some of the risks involved. Educating a sufficient number of citizens to such expertise is vital for a society's self-determination. Science is also part of cultural life and as such human right law protects a right to participate in such endeavours.[65]

It becomes important to recall that the International Bill of Rights has global legitimacy. The rights enshrined in the International Covenant on Political and Civil Rights, the International Covenant on Economic, Social and Cultural Rights and the Universal Declaration of Human Rights are based on agreement. A general agreement on the fundamental rights and entitlements of all human beings should have to help each one to pursue their ideal of a good life in harmony with others worldwide. Extensive as those rights are, extensive is the agreement on people being entitled to them.

Human rights law and many international organizations have been very clear on the importance of technical and scientific international cooperation. The harms that afflict the poor and major environmental problems cannot be seen as problems that solely perturb the countries where those issues are present.[66]

Recognition theories. The fundamental concept behind recognition theories can be found in Hegel's memorable words "they recognize each other as mutually recognizing one another".[67] It is hardly surprising, then, that this small statement has attracted the attention of countless scholars. According to an interpretation of this passage, action that nurtures recognition has to be simultaneous, reciprocal, transitive, reflexive and symmetrical.[68] Hence, a distinctive trait of this approach is the possibility to condemn relations of dependency and of one-sided influence. A contemporary representative of this tradition, Nancy Fraser, has specified the importance of being able to participate as a peer.[69] In the

[63] cf. Korthals and Timmermann (2012) [here reproduced as Chapter 4]
[64] Timmermann (2013) [here reproduced as Chapter 3]
[65] cf. Shaheed (2012)
[66] This point has been reaffirmed by a number of declarations at the turn of the century, perhaps most prominently by the UN Millennium Development Goals.
[67] Hegel (1807/1970)
[68] Limmer (2005)
[69] cf. Fraser (1998)

context of science and technology development this can be interpreted as making research efforts more inclusive, in formally recognizing parties that where vital in bringing out a new product and in not systematically discriminating certain research contributions without good arguments. Therefore, recognition theories are a powerful tool to demand that inventive capacities of indigenous communities are publicly recognized. Making the possibility of mutual influence imperative provides a justification for capacity-building efforts.

(Re)claiming the commons. In the realm of science and technology, innovation rarely comes out of thin air. Access to prior knowledge and data is vital for the inventive mind and we greatly rely on what previous researchers have observed, catalogued, described, refuted, discovered and invented. Setting boundaries to the use of knowledge and biomaterials by granting exclusive rights becomes increasingly restrictive for competing researchers. Many researchers from poorer institutes or those whose research area has a high patent density have insurmountable hurdles to overcome. Creative artists encounter similar constraints when making remixes or collages. This general problem has motivated a number of scholars to defend the public domain and common-pool resources, in order to secure the "building blocks" for future creativity.[70] Those "building blocks" are essential for the continuous improvement of living conditions and to secure creative liberty.

Scientific values. A widely shared conception of the so-called scientific ethos has been propounded by Robert Merton. He mentions four elements: communism (later communalism, in the sense of being community-centred), universalism, disinterestedness and organized scepticism.[71] Especially philosophers of science have been accusing intellectual property for corrupting the scientific ethos. Intellectual property allows one to block access to the datasets on which one's scientific contribution is based. Copyright protection enables journal publishers to charge high prices for subscriptions. Lack of access to new scientific contributions limits the possibility of universal validation. The principle of universalism demands validation outside one's close circle of colleagues. A second demand of the principle of universalism is that careers be open to talents. Intellectual property fosters an environment where research avenues are barred, making it much more difficult for outsiders to prove themselves as talented. The ideal of communism calls for a common ownership of research results. It highlights the importance previous findings have for future knowledge production. Recognition and esteem of individual contributors is something that

[70] cf. e.g. for music see Boyle (2008) pp. 122-159, for synthetic biology see van den Belt (2012)
[71] Merton (1973), and cf. van den Belt (2010)

is still considered prudential, since they function as incentives. Here again the power patent holders have to control follow-up innovation is something that is condemned by followers of this tradition. They further point out that both the ideals of disinterestedness and organized scepticism are difficult to follow when financial stakes are high.[72] By making specific scientific innovations profitable, intellectual property creates an environment where people over- or undervalue certain inventions for other than scientific reasons.[73]

In the pro-poor innovation context the Mertonian scientific ethos demands research results to be accessible for all, not forgetting research institutes in the developing world. Knowledge should not be locked-up in order to maintain the profitability of obsolete products or second-best solutions. Arguably, some followers of this scientific ethos would also demand a fairer evaluation of the value of traditional knowledge.

Conclusion

This article examined the main arguments used to justify knowledge protection, that is, to withhold knowledge from the public domain (even if "only" temporarily). Then, some peculiarities that have to be taken into consideration when dealing with the life sciences were addressed. The third section discussed the central ethical theories used to justify pro-poor innovation.

It is difficult to say which ethical theory should be favoured. I am inclined to believe that advocating the use of a particular theory would stifle the discussion and should therefore be avoided. A plurality of ethical approaches is the best way to do justice to the heterogeneity in human needs and cravings. Personally, I am particularly concerned with the issue of scientific participation and thus have used the capabilities and human rights approach supported by some elements of recognition theories to justify my position.[74]

Whatever approach one considers as prudent, it is important to extensively engage with a central issue mentioned earlier: we live in a world of extreme inequalities. This has enormous consequences for the poor. The poor do not only suffer from being poor, but also from being so much poorer than the rich: as Thomas Pogge notes, researchers from poorer countries have already started to shift agendas to address richer markets.[75] Satisfying sophisticated appetites of people living in the developed world is economically much more profitable for business companies than addressing the urgent needs of the poor. The developed world has a huge advantage due to its technological head-start; this includes the ability to partially control follow-up innovations as discussed

[72] cf. Flory and Kitcher (2004) pp. 57f.
[73] for examples on biomedical research, see Reiss (2010)
[74] cf. Timmermann (2013) [here reproduced as Chapter 3]
[75] On the Indian pharmaceutical industry, see Pogge (2008b) p. 231

earlier. Established research networks and sophisticated patented research tools give the developed world an enormous advantage to excel in whatever field of research is discovered in the future.[76] Under such extreme inequalities hard work and ingenuity alone will not be sufficient for the Global South to catch up. A substantial change in attitude is needed. Creativity and inventiveness coming from the Global South has to be valued for its own virtues and incorporated in a global innovation system. This way both the Global South and the developed world will mutually benefit from working together.

[76] cf. Timmermann and van den Belt (2012b) [here reproduced as Chapter 6]

3.

Sharing in or benefiting from scientific advancement?

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Abstract

The intellectual property regimes we have currently in place are heavily under attack. One of the points of criticism is the interaction between two elements of article 27 of the Universal Declaration of Human Rights, the widely discussed issue of being able to benefit from scientific progress and the less argued for position of having a right to take part in scientific enterprises. To shine light on the question if we should balance the two elements or prioritize one of them, an exploration will be offered on how benefiting from scientific progress and the ability to participate in the advancement of science relate to securing human capabilities. A different perspective to the question will be gained by identifying the problem as an issue of misrecognition, especially the failure to recognize many willing collaboration partners in scientific research as peers. Lastly, I will argue that cooperative justice requires that if we have an innovation incentive system that disproportionally benefits one particular group, a certain duty to counterbalance this advantage exists when we are relying on mutual cooperation for the recognition of intellectual property rights.

Keywords: scientific participation; objects of innovation; development; global justice; human rights; human capabilities; recognition as peers.

Article 27 of the Universal Declaration of Human Rights (1948, hereinafter UDHR) states "[e]veryone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits." In the following I will concentrate in the last section of this article, the right to share in and benefit from scientific advancement. This part of article 27 contains two elements, the idea of sharing in a particular endeavour and the possibility of enjoying the benefits of such type of enterprises. In this article I will conceptualize the relation of the two elements to (1) human capabilities and (2) ensuring recognition, then (3) discuss the effects on global justice caused by pursuing any of the two elements independently, and lastly (4) analyse the problem of cooperative justice with a special emphasis on the way we have chosen to incentivize innovation: intellectual property.
The purpose of this examination is to highlight the effects on the fulfilment of human rights in general a potential prioritization of any of the two elements of this right may have. Hereby I will take the intellectual property regimes we have now established as the background condition in order to better judge the existing incentive system and to serve as a tool to analyse any proposed alternative system. A brief overview to those regimes and their effect on the rights enshrined in article 27 will serve as an introduction.

Introduction

Many, but certainly not all inventions we have nowadays on our shelves and surroundings came to existence due to the possibility of recouping expensive research and development costs. Patents, most prominently, but also plant breeders' rights, trademarks and, in some jurisdictions database rights, enable researchers to make their investigations lucrative. These exclusive rights have become globally increasingly important after the Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS) progressively started to become effective worldwide from 1994 onward. The TRIPS agreement made it binding for all World Trade Organization member states to recognize intellectual property rights and allows trade sanctions for countries where violations of those rights are commonplace. Nowadays patent rights have a validity of mostly 20 years, while copyright lasts commonly 70 years after the author's death.

Granting a temporary exclusive right to innovators on their invention may allow them to recoup their prior expenses (including advertising costs) by preventing competitors to free-ride on their creative effort. For this however to be successful, a number of conditions apply: (i) the fruits of their labour have to attract a given number of customers with sufficient purchasing power, (ii) the developed objects should not contradict public morals[77], and (iii) meet certain minimum inventiveness and novelty criteria to be granted exclusive rights. Further, (iv) the possibility to attract a sufficient number of paying customers is higher for objects that cannot be independently reproduced. Objects of innovation that do not meet these criteria will have a hard time recouping their research and development costs.

Relying primarily on this instrument for incentivizing research has two negative consequences: one, fundamental research and indigenous innovation are insufficiently incentivized, and two, refraining from using exclusive rights to recoup research and development costs has become a luxury many cannot afford.

The first problem leads to future undersupply, something that has to be addressed using different incentive mechanisms. This is the case with fundamental research, which predominantly in the developed world is financed by governmental grants. Fomenting the creation of new tools for their industry constitutes a main motive for continuing to do so.[78] The case of traditional knowledge (here encompassing indigenous, tribal and grassroots innovation) is less fortunate, a lobby demanding funds seems unable to recruit sufficient political influence for this branch of innovation, leaving the support for a stimulating infrastructure and network in a precarious state. To add to this problem, it has been argued that many people are so poor that they can only make use of technological advancement if the inventions can be reproduced using spare local resources.[79] Inaccessibility to the benefits of scientific progress becomes inevitable when this is not deliberately taken into account. If research agendas are dictated according to market demands, being defined by the monetary size of the market, not the number of customers, the huge purchasing power disparities will greatly misrepresent *per capita* demand and thus people's basic necessities. There will be no democratic setting of research agendas, which will leave the needs of the poor systematically unfulfilled when they fail to match

[77] cf. TRIPS agreement (1994), article 27(2): "Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect *ordre public* or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law."

[78] cf. Stephan (2012)

[79] cf. Gupta (2010)

the ones of the economically prosperous.[80] Necessity may also oblige the global poor to use technologies that are deemed culturally unacceptable[81] or socially inadequate. This is a problem from which citizens of countries with strong democratic commitments do not escape either. People had no alternative than to accept certain technologies, an example being the wide use of genetically modified crops for animal feed, despite the wide public rejection of genetically modified organisms.[82] In a globalization context, Elizabeth Anderson notes that the effectiveness of contraceptive policies is in jeopardy in societies where women do not see themselves as agents who actively choose to have sex, which make contraception methods that require planning and daily use socially inadequate.[83] This omission has far-reaching effects on population control and career development for women, particularly in non-Western societies.

While the first problem has been greatly discussed as a matter of global justice,[84] the second problem, concerning the direction research is taking, has gathered less attention. Perhaps most prominently the latter has been addressed by the free/libre and open source software movement.[85]
As mentioned earlier, the societal recognition of intellectual property enables inventors and their financial backers or supporters to recoup their research expenses by applying for temporary exclusive rights. Those rights are, as the name clearly states, exclusive – by definition some people will not have access to the protected object for the limited period that the patentee is granted a monopoly use of his or her invention. While the open source software movement is primarily concerned with the malleability of the objects of innovation, particularly their adaptability to personal needs, the impact of exclusive rights on science and technological development is of much greater scope. Hesitation to reveal early findings has increased in order to ensure patentability of subject matter, thus limiting scientific discussion and the spontaneous sharing of samples.[86] Using exclusive rights for sales creates artificial scarcity, leaving some people without the benefits of scientific progress. Those classical economic dead-weights are literary dead-weights when it comes to vital medicines[87] or specific crops destined for harsh environments. If research can only be undertaken by

[80] cf. Korthals and Timmermann (2012) [here reproduced as Chapter 4]
[81] cf. Chapman (2009)
[82] For Europe, see TNS Opinion & Social (2010). While the rejection of genetically modified organisms is less fierce in other parts of the world, the recent ballot on California's Proposition 37 show that a great percentage of the state's population wants to know which foods contain genetically modified organisms.
[83] Anderson (2007)
[84] see Pogge (2008b)
[85] see Schoonmaker (2007)
[86] cf. Eisenberg (2008)
[87] Pogge (2008b)

being subject to the use of market incentives that rely on intellectual property rights, it will inevitably restrict some people from enjoying the benefits of scientific advancement. As the excluded group consists primarily of the global poor, people with certain moral convictions might find it objectionable in itself to add to greater inequality by leaving the worst off people in a relative inferior position.[88] Promoting scientific advancement would under such conditions contradict some types of egalitarian notions of justice.

Relying on market mechanisms in a world of extreme inequalities does not only shape research agendas towards a very particular, not democratically chosen, direction, but attracts the overwhelming amount of resources to one small section of science: the development of saleable technological products.

The more scientists and engineers manage to recoup their research and development costs by making use of exclusive rights and thus become self-sustained, the higher the pressure for others to follow the same procedure. Scientists and engineers who are not self-sustained become the exception rather than the rule. Choosing to practice science that does not aim at making profits, or generally seeking for openness, becomes a luxury that is increasingly harder to defend. To escape this burden scientists and researchers continuously switch to research lines and methods that appear commercially valuable – doing so reinforces societal expectancies of science being self-sustainable. This endangers cognitive diversity and we have to remember that science has benefited greatly from the few rational agents who due to stubbornness or self-confidence have insisted on less prominent rival theories who have proven to turn out accurate.[89] A good example is Alfred Wegener, who after publishing his groundwork on plate tectonics 1912 spent the remaining time of his life fighting for support, disregarding the hostility with which his theory was received. He only received wide recognition for his great contribution in the early 70s, over three decades after his death.[90]

[88] An interesting example is the technological progress in fuel efficiency for vehicles. If the rise of fuel prices is (at least slightly) counterbalanced by the availability of more fuel-efficient cars, public outrage due to the unavailability of options is dampened. However this option is only available for countries whom themselves are producing technologies. Poorer countries have to continue to rely on the older fuel-inefficient alternatives while paying proportionally much more for fuel.

[89] cf. Kitcher (1990)

[90] see Greene (1984)

On the legal history of the article 27

The dominant reading among legal scholars of article 27 of the UDHR sees it as the basis of the human right to benefit from scientific progress.[91] The emphasis on this specific dimension has pushed the right to participate in scientific endeavours into obscurity. One reason for such reading might have been the phrasing of what is considered the corresponding article to the UDHR article 27, the International Covenant on Economic, Social and Cultural Rights (1966, hereinafter ICESCR) article 15.1.[92] This article does not mention scientific participation unambiguously by name:

> The States Parties to the present Covenant recognize the right of everyone:
>
> (a) To take part in cultural life;
>
> (b) To enjoy the benefits of scientific progress and its applications;
>
> (c) To benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

To see scientific life as part of being able to participate in enlarging the cultural heritage of humankind might require more interpretative work than legal scholarship commonly allows. First, one has to consider science as part of the cultural heritage of humankind. Conceding that, one has to understand a right to "take part" as having not only a passive connotation (being a spectator or a recipient) but also an active element (being an actor or contributor). This however seems to have been the thought of the Chinese delegate during the drafting sessions of the Universal Declaration. Peng-chun Chang noted that "not only must the right to share in the benefits of scientific advancement be guaranteed to everyone but also the right to participate in work of scientific creation. In the arts, letters and sciences alike, aesthetic enjoyment had a dual aspect: a purely passive aspect when man appreciates beauty and an active aspect when he creates it".[93]

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[91] Examples of this interpretation are offered by Chapman (2009); Marks (2011); Donders (2011); and Plomer (2012). The reading I defend hereafter is in part shared by Shaver (2010).

[92] In relation to food production, ICESCR article 11.2(a) foresees that "States Parties … individually and through international co-operation … [shall take measures to] improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources".

[93] Quoted in United Nations (1948), transcribed

A contribution to science is required to take into critical consideration previous scientific knowledge and to do so in a more systematic manner than is generally prevalent in other areas of cultural life. In science originality is not a virtue in itself, a laudable contribution has to consist in either a major revision of existing theory or exploring the previously unknown. Therefore familiarity with the state-of-the-art is virtually a prerequisite. Due to those differences capacity building becomes mandatory to enable people to participate in scientific life.
Understanding human rights primarily as a set of negative duties will favour a reading that at the most prohibits unjustifiable exclusion of people from cultural life. The history of the drafting of ICESCR article 15.1 suggests however that more was on the mind of human rights legislators than this minimum constraint. An initial draft[94] submitted by the UNESCO contained the following elements:

> The Signatory States undertake to encourage the preservation, development and propagation of science and culture by every appropriate means:
>
> (a) By facilitating for all access to manifestations of national and international cultural life, such as books, publications and works of art, and also the enjoyment of the benefits resulting from scientific progress and its applications;
> (b) By preserving and protecting the inheritance of books, works of art and other monuments and objects of historic, scientific and cultural interest;
> (c) By assuring liberty and security to scholars and artists in their work and seeing that they enjoy material conditions necessary for research and creation;
> (d) By guaranteeing the free cultural development of racial and linguistic minorities.

The UNESCO draft is far more explicit in identifying positive duties and a dichotomy between scientific and cultural life becomes harder to defend. This passage does also not lead us to think that being identified as a scholars or artist is a prospect limited to an exclusive group of people. Together with clauses that forbid discrimination, section (c) of the cited draft article gives us to understand that ensuring the basic circumstances for being able to participate in scholarly activities was an ambition early human rights legislators indeed had in mind. The Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications issued 2009 by the UNESCO reaffirms this position, by raising awareness on the huge disparities in research capacities between the developed and the developing world. Among the negative effects of a lacking research infrastructure count the inability to influence the direction of scientific

[94] Quoted in Green (2000)

progress and the capacity to hold governments accountable for it, the lack of participation opportunities for citizens and difficulties in assessing the impact of science and technological development.[95]
The sections that follow will provide philosophical arguments on why this suggested reading should be adopted. While I will continuously address the influence of intellectual property, this should not be understood as it being the only factor or the most significant issue at stake. Loss of resources due to corruption in educational and research institutes, the widespread refusal to educate women, missing or inaccessible day-care facilities for children particularly limiting the career opportunities of young mothers, plus the huge inequalities in income, are factors that might have a far greater influence for scientific participation. Additionally, securing the freedom to move and communicate beyond national borders thus facilitating social encounters that can materialize in future collaborations is a key element to foster scientific advancement.

A human capabilities perspective

The link between scientific advancement and human capabilities is twofold. Participating in scientific endeavours can help people reach certain capabilities and the fruits of such undertakings can provide technologies as well as knowledge that can play a substantial role in expanding human functioning.[96] The first aspect falls under the human rights element of sharing in scientific advancement, the second under benefiting from scientific enterprises[97].
Some objects of innovation help people to attain capabilities that their personal condition would not have allowed, e.g. a wheelchair greatly enhances the possibilities of free movement for a person with certain types of disabilities. Other objects allow people to restore their functioning to the original state, e.g. recover from a disease or rehabilitate one's damaged natural environment.[98] A

[95] UNESCO (2009)
[96] The capability approach distinguishes between functionings and capabilities. Functionings relates to what one can do and be, e.g. being creative and contribute to knowledge. Capabilities refer to the opportunities to achieve the mentioned beings and doings, e.g. choosing to develop one's creativity or having the freedom to undertake the necessary tasks to be able to contribute knowledge (Robeyns 2011).
[97] The link between capabilities and the right to benefit from the scientific advancement has been discussed by Marks (2011) at great length.
[98] In order to ensure that objects of innovation are indeed converted into capabilities or functioning, not only personal conversion factors (i.e. individual limitations or special talents) have to be taken into consideration, but also social and environmental conversion factors, cf. Robeyns (2005). Here design can play a bridging function to facilitating an effective conversion, cf. Oosterlaken (2009).

third category of objects substantially facilitates daily life interactions and meliorates living conditions. We may think of the invention of sanitation systems, facilitating the provision of clean water and the adequate disposal of sewage, leaving people with substantially more spare time for leisure activities. Cheap and readily available paediatric vaccines have reduced the time having to be spent caring for sick children. Women, who are disproportionally overburdened with such tasks, have gained substantially with such improvements by having more time to pursue other goals in their lives. Communication technologies allow people to participate in political discussions with up-to-date knowledge. In sum, scientific knowledge coupled with engineering skills and understanding allow people to achieve, restore and facilitate the enjoyment of objects covered by human rights clauses and identified as central human capabilities. Nonetheless, we should be critical to what we empower people to do, science can be put both at service but also to the detriment of society.

The sustainable development of new technologies through scientific advancement inevitably raises the bar of what may be considered normal human functioning.[99] To take an example, scientific progress in the area of nutrition has shown us that many of the disorders once thought inevitable are traceable to specific micronutrients deficiencies, shifting many of those widespread disorders to the category of that which is preventable. Knowledge on what constitutes a better diet and the safer handling of food, such as refrigeration, hygiene and pasteurization, has triggered the search for technological solutions to overcome existing shortcomings. The development and widespread use of those technological solutions raised the level of what is considered normal human functioning by a greater satisfaction of physiological needs. However this improvement demands further research, as new scientific knowledge and technical knowhow is again needed to overcome the negative effects of this change, as well as to maintain and regulate the technological products implemented.[100] Generally we can say that the advancement of science and the availability of new technologies allows us, or even obliges us, to periodically reconsider which capabilities society can reasonably facilitate for people.

The capabilities approach can justify both a claim to have access to the objects of innovation and inclusion in their development. Access to those objects may expand human functioning and thus is of instrumental importance. With regard to inclusion in scientific research and technological development, the capabilities

[99] Non-sustainable development will have the opposite effect. With environmental degradation, or deterioration of health in general, lesser functioning can be expected. A more sedentary life style has already lowered the threshold line of what was considered normal bodily functioning in the past.
[100] cf. Baulcombe et al. (2009)

approach requires a longer line of argument. Here participation can be justified instrumentally as it fosters the full use of one's senses, imagination and thoughts, to use Nussbaum's terminology.[101] Arguing for a right to scientific participation opportunities would have a weak foundation if it is solely based on being a vehicle for using or promoting one's mental faculties. As a philosopher, I can escape the charge of narcissism by arguing that participation in scientific endeavours facilitates the use of one's mental faculties in a *meaningful* manner.[102] Not being limited to engage in meaningless endeavours alone can be considered as a prerequisite to claim that one enjoys full human functioning. Nowadays it is inevitable that wanting it or not, some daily activities will be devoid of meaning or purpose, as some tedious tasks still have to be completed to meet our basic needs. We can nevertheless argue that being able to enjoy a good life requires that at least some aspects of life have meaning. A prosperous society that seeks to ensure human capabilities will have to grant some liberty in where a person wants to find meaning in her daily undertakings. While some can content themselves in finding meaning in personal relationships, other people need a certain social infrastructure to find meaning in their life. One of those social constructs where a series of people are bound to find meaning in their lives are scientific enterprises.[103] That being true, we could stipulate that a certain duty to enable those people to take part in such initiatives will fall to scientific enterprises in general by virtue of being the sole locus where those people could realize their concept of a good life. That the right to work is commonly understood as one being able to find an adequate job supports this perspective.[104] Recognizing a societal duty to facilitate meaningful interactions would direct all types of socially meaningful endeavours with a call for inclusion. Here we can think of duties of non-discrimination among groups of people with comparable scientific abilities[105], as well as positive duties in terms of engaging underrepresented groups in scientific activities.

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[101] cf. Nussbaum (1997)

[102] To define "meaningful" in this context, we can borrow from a definition of "meaningful work" provided by Arneson (1987). He identifies the following characteristics: work has to be interesting, calling for intelligence and initiative, allow the worker a considerable freedom to determine how the work is to be done and having a democratic say on the work process as well as employer's policies. I would further add that one's work should be subjectively identifiable as a contribution to the well functioning of society (provided this is a freedom one wants to pursue).

[103] Alternatively, we can frame a demand of being included by recognizing that some people identify a scientific career as a calling or vocation (*sich zur Wissenschaft berufen fühlen*), cf. Weber (1919/2002).

[104] cf. Steinvorth (2009)

[105] E.g. if our goal is food security and that is our main valuation criteria, a promising seed variety should not be judged based on its origin but on proven efficacy. Brand labels should not play a role in the assessment.

Conceding a right to participate in science will raise certain demands for not only being able to undertake trivial research, but also to take also part in advanced scientific enterprises. Scientific work is one of the tasks that is affected by the Aristotelian Principle as identified by Rawls, meaning that while practicing science one continuously develops certain skills and this may lead to high virtuosity in a given field.[106] As Rawls states, "… human beings enjoy the exercise of their realized capacities (their innate or trained abilities), and this enjoyment increases the more the capacity is realized, or the greater the complexity"[107] – in science encouraging the realization of those capacities will have to be linked to capacity-building efforts as well as guaranteeing basic material needs, otherwise people with few means would be systematically left out.[108] In addition, it has been repeatedly argued that prolonged repetitive and dull work limits the possibilities to successfully engage in creative work in the future, and this not only professionally but also during one's spare time.[109]

More interesting is it to see inclusion in innovative enterprises as having the additional capability to actively care for one's society, nature or a particular individual, while seeking for a solution by making use of one's reason.
There are two elements in showing concern, one being the possibility to express an emotion, e.g. sorrow, or being able to protest. While this is something Western societies now take for granted, we should not forget that this has been a societal achievement. However the possibility to express dissatisfaction with the current level of welfare or a case of misfortune should not be limited to the emotional level for the majority of the world population. Nowadays, most people in the world can only change their current situation or the situation of the people they are concerned about by physical labour or by making use of their bodies. People that are unskilful with their bodies or whose body manifest endowments of scarce social appreciation, have hardly an option to do something to promote their cause. Here I do not want to put emphasis on actually succeeding, but merely on being able to undertake a considerable effort in that direction or, more colloquially, the possibility of "giving it a good try".
The great majority of the world's population could do significantly more in helping the people they care about if they work in an environment that promotes the use of their intellectual faculties and facilitates peer evaluation of resulting ideas. The actual value of traditional knowledge, or parallel knowledge systems

[106] cf. Rawls (1999), here I rely strongly on the interpretation of Taylor (2004) and Dumitru (2008)
[107] Rawls (1999), p. 374
[108] If we acknowledge John Harris' arguments to consider scientific participation as a duty (Harris 2005; Chan and Harris 2009), providing the necessary infrastructure will allow a broader range of people to discharge such duty, and this not only as research subjects but also as researching entities.
[109] see Sayer (2011) with accompanying references.

in general, for industrial and academic science is heavily debated.[110] However, treating as non-existent contributions that are not using standardized nomenclature and written in customary "scientific style" obstructs the efforts of millions to increase social welfare. It also suggests that industrial and academic science has a far greater role in solving today's problems than one should legitimately attribute it.

Justifying inclusion from a capability "to actively care for others" perspective has also an additional advantage. Being motivated by wanting to help others, driven by a sense of fraternity, and choosing science as a vehicle to manifest concerns makes science a social enterprise. Practicing science for such a purpose has to be interwoven with the social context, demanding up-to-date knowledge of prior art as well as extensive research networks. Herewith the demand is to not understand science as a solitary occupation but emphasize its interactional character. While a sophisticated computer simulator could in theory secure the capability to use one's senses and imagination, the possibility to have an impact on society is a prerequisite for ensuring the capability to actively care for others by using one's intellect.[111]

However the use of this capability has some shortcomings. First, if scientific participation possibilities are grounded on fulfilling the capability "to actively care for others", those scientific enterprises will have to be bound to delivering products that directly benefit society. Scientists will thus not be able to pursue their curiosity as they like – a traditional scientific liberty will have to be given up. Second, if we ground inclusion in scientific enterprises on a capability "to actively care for others" we do not specify up to what level people have a right to be scientifically educated nor to which type of infrastructure they should have access to. At a minimum level, any contributor of a piece of knowledge that is absorbed by the scientific community is sharing in the advancement of science, thus enlarging the pool of knowledge from which socially relevant innovation

[110] cf. ICSU Study Group on Science and Traditional Knowledge (2002)

[111] We might consider facilitating wide scale migration of talented scientists to the developed world as a possible solution to the problem. However, we should test this solution with the liberty of being able to live in one's social and cultural environment. Having to choose between the set of goods "family life, cultural and natural environment" and the possibility of practising science on a higher level will question the real freedom involved in that choice. Living in a world of limited resources demands a certain type of flexibility on the scientist's behalf, which has to be commensurate to the sophistication of the demanded infrastructure. We can thus ask people to move from a rural to an urban area for some highly specialized careers, in some cases even from one country to the other. Capacity-building on tight budgets should aim at serving the greatest number of people, the selection of urban or rural locations for setting up research infrastructure should underlie this principle.

can be developed. An indigenous community who has been victim of biopiracy is sharing in scientific advancement, even if deprived from moral interests such as attribution of authorship and eventual financial benefits.
Since the obligations bound to securing the right to participate in scientific advancement will differ so drastically if society has to secure equality of opportunity in scientific careers while offering the necessary infrastructure, or merely a fair scientific assessment of contributions of knowledge, we will try to gain additional insights using recognition theories.

Recognizing the developing world as a partner

Let us assume that we could have a much higher rate of innovation if the developed world would be the sole provider of technological solutions. Any effort for capacity-building in developing countries would be relinquished in order to increase efficiency in scientific production in the developed world, and this under the benevolent argument, that the given distribution of research and development facilities leads to more people being able to enjoy the fruits of scientific progress worldwide. Conceding that there would be substantial welfare gains, some injustices would still be left unresolved.
The resulting type of contentious relationship fits normatively under the rubric of the social problems of misrecognition, particularly the sort identified by Nancy Fraser under failing to recognize someone or a community as a peer.[112]
The controversial issues surrounding the problem of recognition and its response are legion. First, global hazards are currently only tackled by a highly select section of the global community. This leads to the second problem, when people cannot mutually influence each other a biased perception of dependency is developed. Third, this feeling of dependency is not fully justified; humans by nature tend to skilfully adapt tools to their needs while using them. Innovation occurs everywhere – recognition thereof not. And lastly, some changes in distribution have to take place in order to ensure future recognition as peers.

I will start with the first two points. The world we share with poor and rich alike as well as our bodies that share a common constitution are vulnerable to a variety of similar threats. Climate change and AIDS/HIV are perhaps two of the most prominent global hazards we currently face. While those hazards are global, the development of technological solutions occurs only in limited and exclusive communities. As those objects of innovation often facilitate the fulfilment of basic needs, the resulting relationship can be labelled as one of dependency. A picture of the developed world rescuing over and over again the global poor from naturally occurring and self-inflicted problems becomes

[112] cf. Fraser (1998)

inevitable. This can hardly be identified as a relationship among equals. If people are not able to mutually assist each other they will inevitably fail to see each other as peers. Especially in the area of science and engineering we have a huge potential to assist each other notwithstanding cultural differences. The objective treatment of knowledge permits a dialogue that in other areas of culture would be much more difficult to attain.
The provision of a technical solution by one part of the world, i.e. the deliberate creation of a public good, may engender in the other part of the world a wish to reciprocate that will be difficult, if not impossible, to realize. Being without means might alleviate this felt burden, but nevertheless perpetuate a unilateral sense of debt.

In a certain way, it is inevitable that some dependency endures. The mere existence of exclusive rights for inventions allows temporary monopolies. If the invention is a necessity – an object that helps people to secure their basic needs – dependency is the outcome. Nevertheless, we should still question a global social structure that systematically favours a specific type of innovation (i.e. the ones that are patentable) and innovating (proprietary research models) at the cost of grassroots innovation, advances in traditional farming and generally non-proprietary research practices. Therefore, the traditional methods of incremental improvements may be a more beneficial approach, especially if they are the only ones feasible for the major part of the world's population.
There is a substantial difference between sustaining a group in need and perpetuating dependency. Situations of dependency that are preventable should not be judged on the same basis as inevitable dependency. Any policies that deliberately retard or hinder the efforts of some groups in gaining self-sustainability should be judged as an attempt to limit self-determination.
Awareness of one's own or the other parties' dependency has also some major effects in the economy, especially when bargaining agreements or settling sales contracts. The history of political economy has shown us that by fostering technological development states can gain a much stronger advantage in increasing the exchange ratio of their people's labour hours than by continuing to produce or extract traditional goods.[113] This will leave people who abstain from technological innovation in a permanent position of disadvantage.
We can nevertheless think of institutional arrangements that could lift this disadvantage, leaving questions of feasibility completely aside. A world where such disadvantages are neutralized would still be a place where one society can offer products that the other society will not be able to produce, as it will lack the infrastructure and necessary know-how. It will be a place where one group is obliged to engage in exchanges while the other can trade just if it sees an advantage in doing so. Intellectual property, creating artificial scarcity, not only

[113] cf. Drahos and Braithwaite (2003) and Galeano (1971/2008)

grants exclusive rights, but also counts as a publicly documented proof of being the sole legal provider of a given asset. This is an advantage natural resources generally do not have – something that comes at quite a high price when bargaining for a fairer deal and for felt indispensability. In terms of productive capacity, some states could vanish altogether without causing disruption in the others' daily life.

Continuing with the third point. There is a huge amount of unacknowledged reciprocity for inventions placed in technology-dependent societies. Developers of technologies gain many insights from their users. It lies in human nature to develop and adapt tools. When people start using inventions made by others, it will not take much time until they find new uses. In order for it to be true that a community is solely a technology receiver, and not a co-inventor or technology adapter, inventiveness would not only have to be neglected, but even prohibited and severely sanctioned. As this is hardly enforceable, leaving aside its desirability as a target, the distinction between technology receivers and technology producers will always be artificial in absolute terms. Maintaining such labels inevitably leads to a situation where some inventiveness is not recognized as such.

Furthermore, inventions are not placed in an abstract environment. Knowledge and innovative potential will be available in the habitat in which a technology is released. Rarely inventions are released in an environment where no predecessors are available. Generally in agriculture, new methods and seed varieties replace local practices and this is not always superseding the performance of earlier established systems. This tendency to ignore indigenous knowledge, or regard it in advance as inferior, is felt as an insult for many indigenous innovators. Often local knowledge is denied as a result of power differentials, the stronger party having the ability to decide whose knowledge counts as significant – an issue overly present in development projects.[114] This problem is accentuated with the tendency to treat indigenous knowledge as one type of knowledge system, while industrial and academic knowledge represent another system. It is common to see the two as strictly separated systems; that those systems may overlap or be of porous transition is something few take notice off. The idea that knowledge production systems outside academia and industry have to be first checked using scientific method is widespread in the developed world.[115]

Identifying one part of the world as the one that advances science and develops technology and the other part of the world as mere recipient, nurtures an atmosphere where any person coming from outside the established circles is perceived as being less worthy of attention. When academic or industry

[114] cf. Dübgen (2012)
[115] cf. Agrawal (1995)

emblems make a much stronger case for judging the time one should invest in critically analysing a new proposal, than past performances or knowledge of the local environment, we can speak of discrimination.

And finally, setting aside enough resources for capacity-building in order to distribute more evenly research and development facilities around the world could help remedy the here denounced situation of injustice. This would lead to a situation where every society can offer the other something that they momentarily will not be able to produce themselves. Even if what a society is producing amounts to little, this might be enough to lose the stigma of being labelled (or identifying oneself) as strictly dependent to the less uncomfortable position of being in the need of assistance.[116]
Capacity-building will also have to tackle another very broad problem: the issue of testimonial justice as identified by Miranda Fricker.[117] Scientists and technology developers in academia and industry adjust their work not only towards financial incentives, but also to reach peer recognition and gain group identity. The pursuit of this latter goal has the effect that a special jargon and working methods are developed. People not communicating in this jargon or using different methods become for established scientists harder to understand and to dialogue with than their habitual peers. Familiarity with certain subject matters creates a feeling of expertise, which completely new approaches do not provide. Radical changes demand much more concentration from the recipient. In order to guarantee fair evaluation, we not only have to stop depending exclusively on established practices, but also consciously dedicate more time to evaluate unfamiliar forms of expression.

There is another element why participation in science is an important issue. By being able to participate in science one asserts a certain influence in its form and direction. Science and the products that become available with its progress, shape profoundly our daily lives; consistency with democratic values demands that those principles are dispersed into this sphere too. The direction research agendas take will have a strong effect on the shape of the future world. There is a democratic interest in having a say regarding what role technology should play in the future and not completely surrendered to decisions made by others.
Proprietary science has made it almost impossible for economically poor aspiring participants to access the tools and fruits of scientific research and practice. At the same time it has become the predominant mode of practicing science and with the help of digital technologies this type of science has also become enormously networked. Despite the mentioned deficiencies, the protection of intellectual property rights has created incentives for investing in

[116] cf. Fraser and Gordon (1994)
[117] Fricker (2007)

research and development, as well as created the necessary guarantees for industry to be able to disclose information related to an invention. The patent system's novelty and non-obviousness requirements however are constantly pushing scientific research towards its limits. Science under this incentive mechanism moves towards meeting in the most cost-effective manner a specific range of research targets that are compatible with the aim of reaching patentability requirements and ultimately market value. This has the consequence that many research interests that are scientific, but fall outside the reach of the incentives of proprietary science, are left unattended or do not receive proper care. The lack of attention given to those research fields is vulnerable to being perceived and interpreted as not being of equivalent merit. Here the market has become the entity that selects research agendas[118] – in a world of extreme economic inequalities, a strongly undemocratic mechanism. As so few people can influence research agendas through scientific participation, we have to consider alternative models or at least offer a strong enough parallel system that is able to rebalance the overall innovation system to add democratic legitimacy to it. Recent scholarship offers a variety of amelioration proposals[119] and open innovation models have greatly enhanced the input possibilities of different communities and individuals, such as amateur and retired scientists and indigenous innovators. Especially the global poor are in dire need of a system that reviews science and the resulting end-products with social welfare as the judging parameter and not with a sole emphasis on possible marketability. In the spirit of democratic principles, people should have the right to participate on equal terms in the decision over what rights they should have over the access possibilities, shape and direction of future technologies and science. Having a larger circle of participants will provide a higher diversity in end products.[120] Without this higher diversity people will be limited in having to accept products (and methods) that were already preselected by others who not necessarily live up to the same set of values – a situation where "real choice" has limited meaning. As a last point, any active exclusion of people will be felt as an offense.[121] Here it is crucial to remove any unnecessary barriers that could hinder participation possibilities. Some barriers might still be necessary to maintain a high level of scientific output; here we can count elements such as having common nominators for naming natural and artificial objects and the freedom to treat knowledge instrumentally (something that might interfere with the notion of sacred knowledge) as necessary for a swifter progress.

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[118] cf. O'Neill (1990)

[119] examples are Hollis and Pogge (2008), Love and Hubbard (2007) and Gupta (2006)

[120] Here we may think of the reintroduction of Chinese traditional medicine and the new willingness to assess unfamiliar treatment methods after the monopoly standing of Western medicine was broken.

[121] In this passage my argumentation is strongly influenced by Waldron (1998).

Science, as mentioned, can play a vital role in improving the situation of the world's poorest, and also the wealthiest, people. Due to this capacity, there is a risk in seeing science as having a purely instrumental function. When perceiving science as a societal tool, we have to acknowledge that we affect the dynamic of scientific progress. The recognition-seeking scientist generally adapts her behaviour to match the expectations of the agent whose recognition is aimed for.[122] Nowadays, most scientists are seeking the recognition of researchers from industry and academia. The moment scientists start to seek societal recognition, rather than only close peer recognition, research agendas change in order to aim at satisfying any diverging expectations.

Prioritizing participation or access

Enjoying the benefits of scientific advancement does not constitute a single-standing right, but allows up to a certain extent the fulfilment of other human rights, particularly the right to health and the right to food. Further, being able to share in the advancement of science for a prolonged time presupposes that the two latter rights have been met. A very sick person suffering hunger can contribute little to science. It can be said that one right is dependent upon having the other rights satisfied.[123] We can go even a step further and say that in most cases people need to have benefited from science before being able to take part in science. This prerequisite being twofold, one not only needs to have access to medicines, to take an example, but also have access to prior scientific knowledge for one's input to be meaningful, this being increasingly dependent on being able to access research networks and scientific infrastructure. Exceptions to this rule are extremely rare.

Let us imagine three possible worlds. One, where any effort in incentivizing people to engage in science is put aside in order to use all available resources to ensure that every person can enjoy the benefits of existing fruits of innovation. The second is a world where it is held to be more efficient to enhance global social welfare if only one particular group of the world concentrates in taking part in science while everybody is allowed to benefit from this group's contribution. The third scenario is a world where a special emphasis is made on building up scientific infrastructure, while neglecting efforts to make the fruits of scientific progress promptly available to the poor. Elaborating those theoretical worlds can give us some insights on how to judge proposals and movements that aim to alleviate the negative effects of intellectual property regimes.

[122] O'Neill (1998)
[123] cf. Shue (1996)

To clarify the controversy of prioritization, I will elaborate on the effects of such worlds starting with the first one. This position considers large-scale scientific projects, examples often referred to are the International Space Station and particle accelerators, as luxuries civil society should condemn while people are massively dying from hunger and disease. Often ignored is that the efficacy and usefulness of a technology depends upon the environment it is placed into. Weeds, bacteria and other organisms develop resistance to agents that attempt to combat them – a phenomenon most prominently characterized by pathogens developing resistance to antibiotics[124]. Then we also have changing natural habitats due to climate change and raising pollutants levels. Stalling scientific progress means for a variety of technologies retrogression in the long term.
This policy is particularly demanding for the better-off circle of people among the current generation. They will not be able to improve their well-being by developing new tools through scientific methods and this partly due to the previous generations' policies of not taking sufficient regard for the situation of the worse-off. The more time is needed to ensure widespread enjoyment of the benefits of science the more demanding this position becomes for the better-off. Such a standpoint limits a higher aggregate welfare in order to increase the welfare of the worst-off.[125] The ICESCR states in article 11.1 however, that being able to work towards the "continuous improvement of living conditions" is a fundamental right. Arguably, this article would give the individual scientist enough room to better her own position, even in cases where strict prioritarianism would morally demand to focus one's efforts on the needs of the worst-off.

The second situation is a world that aims at leaving people above a certain threshold line in terms of welfare. It can have two moral justifications. A sufficientarian explanation that welcomes the needy to benefit from the advancement of science, but sees participation in scientific enterprises as something beyond basic necessities – to put it bluntly, as a luxury people can be excluded from without moral scruple. Or, more benignly, explained by a strict appeal to urgency towards alleviating the position of the worst off while perceiving the availability of resources as limited. In this case capacity-building in the poor regions of the world is seen as a luxury one cannot justify while people are starving or suffering diseases that science could cure or prevent. This position relies strongly on the assumptions that resources are limited and limited to a particular level. However one should differentiate between resources that are limited *per se* and resources that are limited due to resource allocation decisions that especially developed countries can influence or have

[124] cf. Outterson (2005)
[125] cf. Parfit (1997)

previously made.[126] Even if efficiency is the sole determinant for such a policy decision, one cannot escape as a society from having to defend why one has chosen to allocate insufficient resources to address both distresses.

Our third hypothetical scenario is a world in which capacity-building is prioritized over a widespread access to the objects of innovation. For such position to survive Rawls' Difference Principle capacity-building has to lead to enough fruits to leave the worst-off in a better position. As ensuring access is neglected under this approach a strong emphasis on the production of public goods has to be set to ensure that enough benefits reach the worst-off, something that again will limit the freedom to take part in scientific advancement by having to carefully select research agendas. Capacity-building will also have to lead to a substantial number of inventions which can be either acquired or duplicated by the global poor.
This position becomes highly controversial, if we take into consideration that enjoying the benefits of science in order to stay healthy or ensure one's nutritional requirements is something necessary to be able to enjoy other rights and a prosperous life. Millions of people will never be able to share in science as malnutrition in the first years of their lives hampered their full brain development. In addition to that, taking part in scientific progress is a freedom only few people make use of, an even a tinier group would consider it as an essential part for the pursuit of one's ideal of a good life.
An outright reality check impedes us to believe that science on its own, even if heavily subsidized, could significantly improve the situation of the world's poorest inhabitants. Great initiatives that foster grassroots innovation and open science will still have to be supported by organizations that make previous innovations accessible to the poorest members of society.

Practicing science and being involved in product development encourages an active use of one's mental capacities and builds up a critical mass of people that become aware of unknown consequences and also potentials of technologies in use. While asking oneself the question of which element should be prioritized, access to the benefits or inclusion in meaningful projects, one has to keep in mind the huge inequalities and levels of deprivation people in the world face. Further, we should also consider the possibility of refusing to prioritize any of the two elements as a strategy. Facilitating the prospects of participating in scientific projects will primarily benefit people in the social middle class[127].

[126] Timmermann and van den Belt (2012b); (2013) [here reproduced as Chapter 5] criticize the Health Impact Fund proposal on this point for making a too broad commitment towards political feasibility.
[127] Here I understand "social middle class" as the group of people who have their basic needs met and enjoy a small surplus that enables them to undertake risks (i.e. to try out new possibilities) without too much distress. An example would be

Those people are not the very poor, however they are also not the main beneficiaries of existing inequalities nor do they share the full responsibility for the world's institutional injustices. Developing and building up research infrastructure can help a significant number of those people to pursue their conception of a good life. However, the level of deprivation we currently face is extreme, making it justifiable to set aside such efforts in an attempt to ensure a wider access to the benefits of science. Such benefits however have to match the needs of the global poor, a situation we are currently very far away from, as the so-called "10/90 gap" in pharmaceutical research epitomizes.[128] Sharing benefits that only show welfare-improving characteristics for people who already have a high standard of living would not substantially meliorate the situation of the worst-off. A prioritarian position permits restricting scientific participation possibilities as long as doing so effectively raises the position of the worst-off. Urgency makes high reductions of aggregate welfare acceptable, e.g. by lowering the position of best-off, if this is the only way to ensure a higher percentage of people with basic needs met.

Justifying capacity-building: Cooperative justice

One of the goals of extending intellectual property protection globally is to make people be able to benefit from the fruits of their intellectual labour. We could even consider the possibility of doing so as a new global public good. This statement may arouse immediate controversies from different parties. Only a minority of intellectual labourers are able to live from the fruits of what they produce. Which inventions will become lucrative, and who will be able to live from them, has less to do with desert than with circumstances the individual has no control over. Coming up independently with the same invention the day later bears no fruits one has claims on.[129] Closer to reality would be to claim that the recognition of intellectual property amounts to a common good, since it merely allows *some* scientist to live from *some* of their work.

The possibility of being able to generate income from scientific work has some great benefits for scientific independence and industry, but the practical effectuation of this freedom by some has considerable negative effects on others. What are the negative externalities of people enjoying on massive scale this opportunity? Here it becomes critical to establish if those negative externalities

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a small farmer that after securing her basic necessities has still some additional seeds left to test a new agricultural method.

[128] This is the situation where only 10% of the world's resources are used to address the problems that primarily affect 90% of the earth's population, cf. Drugs for Neglected Diseases Working Group (2001).

[129] cf. Nozick (1974)

are due to lack of adaptation to new possibilities, i.e. the price of maintaining antiquated practices, or indeed amount to unfair advantage taking.
Economic poverty, as mentioned throughout this article, limits participation under proprietary science models, thus hiding to the world the real potential the economic poor have to bring out innovative ideas and disclose their scientific observations. There are strong arguments to claim that the use of intellectual property rights as introduced with the TRIPS Agreement (1994) does not only amount to unfair advantage taking but that the advantageous position that came with the imposition of the agreement was foreseeable and some would even argue premeditated.[130] The treaty comes at a high price for grassroots innovators and people choosing to participate in science under a different set of principles. Many of those researchers are actively engaged in developing technical solutions for the problems of the poor. As fairer methods of incentivizing innovation are conceivable,[131] but have not been institutionalized, keeping our patent regime demands a justification to the people suffering its negative consequences. Those people are scientists and technology developers of resource-scarce countries and, most severely, the global poor.

Apart from the above-mentioned problems that affect the liberties of the individual person, there are some specific global justice concerns that require a structural reform. The intellectual property regimes as they stand, face the charge of harming the global poor and as we – the affluent citizens of the world – have established those regimes, we owe the global poor compensation.[132] The two most apparent harms, as discussed earlier, are caused by high prices to objects of innovation secured by the enforcement of exclusive rights on a worldwide scale, and by research agendas set to satisfy the wishes of the rich. Here harm is understood as imposing (and maintaining) a less favourable incentive system and this with the intention of gaining additional competitive advantages. Excluding ourselves from being part of the harming "we" is hardly possible as we strongly rely on the innovation system in our daily lives.[133] Nevertheless, as citizens of democratic countries we can counter this harm by protesting. As scientists and researchers we can also help by refusing to blindly rely on "big names" and being much more open to new currents of thoughts, even when format and label does not correspond to our image of professionalism. Living life as usual continues to strengthen institutional injustices.
Further burdens on the global poor are the following:

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[130] cf. Drahos and Braithwaite (2003)
[131] such as prize systems, see Love and Hubbard (2007)
[132] see Pogge (2009)
[133] Pogge (2008b) accuses the citizens of the developed world of complicity in the institutional harm done to the poor. Others are more hesitant in inculpating the average citizens, e.g. Steinhoff (2012).

Patents are harsh on latecomers. The patent system is a winner-take-all arrangement; the first one to invent (or in many jurisdictions, to file a patent) gets all the benefits. The inventive-step (or non-obviousness) requirement of patentability is in relation to the state of the art. It is relative to what the top of the field have achieved. This improves patent quality, but almost solely at the cost of the researchers that are somewhat behind. We can assume that in both cases the latecomers will mostly consist of researchers with less access to costly journals and expensive infrastructure. Any possible advantages one may come across as a latecomer will vanish if one is not capable to play under the same rules of the game than preceding researchers or is not endowed with a comparable set of starting tools. The so-called "evergreening of patents", the ability to continue to delay the moment generic manufacturers can enter the market without seeking a license, is something that has increasingly come into criticism.[134]

Patent expenses and purchasing power parity. About half of the world population live beneath the two-dollar a day poverty line. This line takes into consideration purchasing power parity, that is the fact that some products are much cheaper in poorer countries than in richer countries.[135] Notwithstanding this being false for many medicines, it is not true at all for the costs of patent protection. Developed world companies can seek exclusive rights for their inventions at comparable much lower cost for themselves in developing countries than companies from developing countries in the developed world. Industry and research institutes situated in the developing world have to acquire (with few exceptions) licenses for follow-up research or product development at world market prices, despite the huge purchasing power differences. Here we can generally question the patent holder's right to have full control over the conditions to grant licenses.

Harmonization of safety standards. Safety standards can be held very high without objections as long as there are cheaper alternatives for the poor or people with fewer resources are not excluded from the high standard products. This is not the case with much technological advancement in agriculture and medicine. Having worldwide standards that are in line with welfare levels experienced in developed countries leads to a situation where many less safe, but still quite cost-effective and beneficent products, are not developed. Many research leads that are feared to not pass safety regulations are dismissed, even though they could lead to welfare enhancing products for resource poor settings – generally solutions that are much better than nothing are put aside.

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[134] cf. Dwivedi et al. (2010)
[135] cf. Pogge (2010b)

The worldwide recognition of the current intellectual property standards has also a row of benefits. There is a set of goods – generally identified under the label "luxury goods" – for which excluding people appears to have no unacceptable consequences. The knowledge gained while developing and researching for those objects listed in patent documents ultimately becomes part of the public domain after a transition time. The diversity of technological extravagancies incentivized by rewards secured by intellectual property leads to an enlargement of the pool of knowledge. In addition to that, people who justify intellectual property on desert-based principles can argue that, on utilitarian terms, the more intellectuals can live from the fruits of their labour the better. Libertarians welcome lower taxation by not having to finance science programs that can sustain themselves through the sales of their developed products.

Even after summing up the global benefits of intellectual property, we can still maintain that the developed world has imposed an innovation incentive system that disproportionally favours the world's richest people. If there are some overall benefits of having this type of regimes established, justice demands that burdens and benefits are to be distributed fairly. In order for intellectual property to be recognized as such, members of society have to accept this method of incentivizing innovation as a necessity that leads to everyone's advantage. This demands a clear balance between private and public interests, with both parties satisfied with the concessions made. When this is not the case intellectual property has to be safeguarded by extortive measures, something that has to be paid for by making the products of innovation even more difficult to access. Further, if we see global trade as a cooperative endeavour where everybody should benefit, cooperative justice would demand a serious effort in capacity-building and a system that fairly evaluates grassroots innovation, as well as compensatory measures like the Health Impact Fund[136]. Meeting one's side of a cooperative arrangement puts us in a much better position for demanding help in times of distress on terms of reciprocity and motivates the other partner in exploring further cooperation possibilities.
Where we can rely on past and on-going positive experiences, as with the cases of vaccine development and large-scale immunization efforts, the establishment of new programs and the reaffirming of existing commitments have shown great success, as the Global Alliance for Vaccination and Immunization (GAVI) exemplifies. However, raised population levels, extreme poverty and increased mobility demand urgently an even stronger commitment to work constructively together, since many of the global hazards we now face demand organized action

[136] see Hollis and Pogge (2008)

at a global scale. Controlling antibiotic resistance[137] and speeding up the sharing of samples in times of epidemic outbreaks[138] are two of the many critical targets.

Perhaps the human rights framework and the capabilities approach do not yield enough argumentative strength to establish claim rights that would assist people in becoming a scientist. However, analysing the huge gap in research potential between the developed and developing world, we have a series of arguments that lead us to condemn current distributions of scientific capacities. If one party feels or is perceived as dependent, dispensable, or even as a burden, we are certainly failing to meet the social goal of people living on equal standing. Enabling people to make a meaningful contribution helps to overcome this problem and this in a way in which both – developed and developing countries – can profit in the long run. Providing scientific infrastructure, education and access to research networks is a certain path to do so.

[137] cf. Anomaly (2010)
[138] cf. Langat et al. (2011)

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Reflections on the International Networking Conference "Ethical and Social Aspects of Intellectual Property Rights – Agrifood and Health" held in Brussels, September 2011

(with Michiel Korthals)

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Abstract

Public goods, as well as commercial commodities, are affected by exclusive arrangements secured by intellectual property (IP) rights. These rights serve as an incentive to invest human and material capital in research and development. Particularly in the life sciences, IP rights regulate objects such as food and medicines that are key to securing human rights, especially the right to adequate food and the right to health. Consequently, IP serves private (economic) and public interests. Part of this charge claims that the current IP regime is privatizing the very building blocks of research and development – that used to be part of the commons. The public domain, in contrast to the private domain, may be the locus of much more diverse forms of creativity that at the same time ensures a wider plurality of productive traditions. An IP regime must support a sense of public morality because it is dependent upon civil support. This inevitably prompts questions of what are "good" exclusive rights and what are "bad" exclusive rights, and how shall such IP rights be developed. We argue that the democratization of the current IP regimes is an important first step to respond to these issues.

Keywords: intellectual property rights, global justice, open innovation, stakeholder conference

Introduction

Public goods, as well as commercial commodities, are affected by exclusive rights secured by intellectual property (IP) rights. These rights serve as an incentive to invest human and material capital in research and development that is destined for a host of resources and goods. Particularly in the life sciences, IP rights regulate objects such as food and medicines that are key to securing human rights, such as access to adequate food and the right to health.[139] Consequently, IP serves private and public interests. Private interests consist of being able to enjoy the fruits of one's labor, and public interests entail the provision of current and future public goods. Extensive research and development (R&D) enterprises are made rentable as rights holders can market their products exclusively, securing the existence of new commodities and due to the temporal limits of IP, also the provision of future goods, as resources become part of the public domain.

As costs of developing a merchantable product in the life sciences have risen,[140] a more stringent market orientation has become more mandatory. Often, goods that were formerly free, must now be paid for by end-users due to high product-development expenses. With worldwide income inequalities it is becoming evident that if economically under – or undeveloped groups and nations are not allowed to make use of the technological innovations of developed countries, they may end up even more impoverished and increasingly vulnerable both economically and geo-politically. Furthermore, objects predominantly needed in resource-scarce markets often are not developed, given that R&D expenses incurred (by either developed or underdeveloped nations) cannot be adequately recovered (this phenomenon is epitomized with the so-called "10/90 gap")[141].

In order to discuss the implications of this status quo and the feasibility of alternatives, researchers and policymakers were convened at a conference in Brussels at the end of September, 2011.

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[139] Universal Declaration of Human Rights (1948, hereinafter UDHR), art. 25.1.
[140] for a recent study in the area of pharmaceutical see Munos (2009)
[141] see Drugs for Neglected Diseases Working Group (2001) and CIPIH (2006)

The grounding idea of the conference

How can appropriate IP regimes alleviate the huge welfare burden incurred by developing countries that engage progressive biotechnology? In other words, how can IP rights contribute to social justice? These questions prompted two Dutch research institutions – the Centre for Society and the Life Sciences and the Applied Philosophy Group [142] at Wageningen University – to engage philosophers, sociologists, experts in IP law, patent examiners, scholars and practitioners from biotechnology, alternative business modeling, development aid, innovation studies, political science, as well as state representatives and EU officials, to discuss the ethical and social issues generated by current IP protocols and paradigms.

Scope of the problem

Research and development in the life sciences lead to huge business opportunities for knowledge economies, and also to possibilities for securing fundamental human rights, at national and international levels. The ever-increasing globalization of trade, epitomized by the worldwide implementation of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)[143], negotiated 1994, has been important to such global biotechnology commerce and the balance of IP. Without doubt, scientific innovation has greatly improved the overall quality of life in the developed world, as well as a longer life expectancy, both due to a significant extent to achievements in biomedicine and in agrobiotechnology and nutrition. Indeed, science and technology could play a vital role in alleviating the predicament of developing and underdeveloped nations of the world, in particular by reducing the 18 million poverty related deaths. An extensive critique on negative influence of trade regimes on world poverty is offered by Pogge.[144] But, given that much of science and technology is provided as proprietary commercial enterprise – and its allocation and sharing regulated by IP governance – we must ask if and how such IP statutes could and/or should be construed so as to better meet the social obligations of science.

[142] The position the group takes to this general problem is exemplified in Korthals (2010), Belt and Korthals (forthcoming) and Timmermann and Belt (2013) [here reproduced as Chapter 5]
[143] Agreement on Trade-Related Aspects of Intellectual Property Rights (hereinafter TRIPS). (Annex 1C of the Marrakesh Agreement Establishing the World Trade Organization, signed in Marrakesh, Morocco on 15 April 1994).
[144] Cf. Pogge (2008b)

Opportunities and reforms

No single solution will address the justice issues raised by the existence of intellectual property regimes – this was recognized and widely appreciated by the participants of the conference. A more scrutinous view of current IP schemes led to posing of three alternatives to existing IP regimes; these are 1) "open innovation", 2) the "access to knowledge movement" and 3) the concept of a "Health Impact Fund". The subjects were discussed in keynote lectures and dedicated workshops, and of particular note was an approach proposed for Brazil, a new emerging economy.

The current IPR regime

Nikolaus Thumm, Chief Economist of the European Patent Office, provided an overview of the justification of current IP regimes: The function of a patent is to address a particular market failure. Research and development costs, especially in biotechnology, are extremely high yet it is relatively affordable to reproduce a product once it has been developed. This reflects a lack of incentive to invest in research and development if/when there is little possibility to recoup the expenses involved. This is where the patents come into play. An inventor has, under a given set of constraints, the option to apply for temporary exclusive rights if he is willing to disclose relevant information to assemble the object of innovation. In this way, civil society limits what is presently in the public domain in order to secure the potential existence of future public goods. The nature of a patent is therefore instrumental: it is a tool to ensure that innovators who produce objects with reasonable research and development costs, and that find a sufficient market, will recover expenses and gain sufficient resources to render such investment worthwhile and thereby continue to make those goods. However, there are limits to which inventions can qualify for exclusive rights. New market opportunities, or the enlargement of the knowledge pool, are not goals to be pursued at all costs; the perception that a patent might conflict the *ordre public* has roots anchored in patent law.[145]

The notion that patenting is good, more patenting is even better lacks empirical evidence. As too little protection of new inventions can limit the future existence of some goods, too much protection can also deter some innovators from developing products in adjacent areas.
As well, patent offices offer civil society the possibility to file for appeals. This is an opportunity to instill checks and balances to confront possible negative effects upon public welfare that were not evident at the time of patent issue. The

[145] An early exposition of Thumm's early perspective on the ethical implications of patenting is offered in Ibarreta and Thumm (2002)

quality of patents in this sense therefore depends on the active engagement of civil society.

Open innovation

Richard Jefferson, Executive Director of Cambia, an autonomous not-for-profit organization connected with Queensland University of Technology, Brisbane Australia, provided an overview of his efforts in making biotechnology research and development more accessible. Concepts such as "open access", "open source" and "open innovation" address not only different levels of accessibility, but represent a sense of attitude and commitment to the public.[146] "Open innovation" does not mean free-of-cost, but free in the sense of being transparent and unrestricted. The complexity of IP regimes often poses a threat to the openness of science by adding uncertainty, and increasing risks of wrong or frankly socially disruptive investments. Jefferson's soon to be released "The Lens", is a public search tool that takes into account patent literature as well as incorporates more public databases and open access journal articles to both inform how R&D are done, who is doing R&D, and where R&D are being done.[147] The question of whether openness leads to fairer distribution is something that remains unresolved until further research.

The workgroup discussions started with a short critical statement by Pieter Lemmens emphasizing the role of commons for the future production of knowledge and their potential to rebalance uneven power relations.[148]

Access to knowledge

According to Carlos M. Correa of the University of Buenos Aires, there are two streams of the "access to knowledge" movement, one that aims to build an information society where knowledge is openly available without restriction, and a second that seeks a general expansion of the public domain. Correa posed the question of if and how can these ideas could be reconciled with initiatives for protecting traditional knowledge through exclusive rights?[149] It became clear that an attempt to protect traditional knowledge by exclusive rights was at odds with those philosophical approaches that are based on sharing, rather appropriating, knowledge. Still, a consistent issue in whether those conventions are of actual interest to the individual indigenous communities, particularly the predominance of Western conceptions of intangible property with customary

[146] See Jefferson (2006)
[147] Patent Lens, see http://www.patentlens.net
[148] P. Lemmens offers a wider introduction to his viewpoint in idem (2010).
[149] Many points of his talk can be found in Correa (2010)

laws, and the extent to which various international statues might consider the nature of traditional knowledge.[150]

Henk van den Belt re-introduced the topic in the especially assigned workshop with a short statement that started with an historical overview of the movement and ended emphasizing the dual role of "access": consumption and participation.

The idea of an impact fund

Linking profits to exerting positive impact on urgent problems is of particular interest for the development of targeted products not covered sufficiently by market incentives (such as medicines for neglected diseases or improvements in agrosciences especially targeted for the needs of the poor). An elaborate proposal for this is the Health Impact Fund.[151] Doris Schroeder, of the University of Central Lancashire (UK) and University of Melbourne (Australia), noted that the idea behind the fund is to offer a reward to companies that aim at maximizing quality-adjusted life years (QALY) of people suffering a particular disease or disorder. While keeping IP rights, the company must be committed to sell medicines at cost-price in order to be rewarded financially proportional to the product impact in increasing QALY.
Cristian Timmermann raised the problems involved in any proposal that leaves the current global distribution of IP rights intact.[152]
Of noted interest was how far the impact fund construct might be implemented in other areas, such as agriculture and climate change mitigation and adaptation. The main criticisms of the impact fund idea question the prerequisite of patents for fund rewards and the maintenance of current power relations.[153]

Emerging countries: Brazil as a case study. A delegate of the Brazilian Mission to the European Union, Eduardo Ferreira provided a detailed overview on the country's new law on the protection of cultivars. Although the law was introduced in order to:

(1) facilitate the exchange of genetic material and the genetic enrichment of Brazilian agriculture
(2) allow imports of commercial seeds and
(3) assure that Brazil can export this kind of material

[150] This distinction is exemplified in Robinson (2008)
[151] see Hollis and Pogge (2008)
[152] A revised version of his statement can be found in Timmermann (2012a)
[153] Meanwhile Thomas Pogge has informed us that the revised version of the Health Impact Fund proposal has loosened up this criterion.

It became evident that the country was also aiming at a stronger enforcement of exclusive rights granted to domestic and foreign seed producers and providing a safe harbor for foreign investment while improving the grounds for future scientific collaboration.[154]

Problems

Different approaches underline the difficulties of generating revised or new IP regimes that more saliently reduce extreme poverty, powerlessness and vulnerability of individuals, communities and nations.

Human rights and IP rights

The right to adequate food and the right to health as per the Universal Declaration of Human Rights (UDHR, art. 25.1) are not the only two rights that are potentially negatively affected by liberties granted by the use of exclusive rights secured by IP regimes (UDHR, art. 25.1). There is a strong plea for a democratization of science, a demand for openness and inclusion, both in active participation and decision-making, that in the human rights discourse are encompassed in the right to share in the advancement of science (UDHR, art. 27.1). There is a widespread indignation about the ways IP rights restrict freedom to operate, and constrict high-level science to be a luxury reserved for developed nations.

IP regimes could play a much more favorable role in improving global human welfare and in securing human rights (TRIPS, art. 6). At present, there is insufficient incentive to both provide innovations that would alleviate problems that predominantly affect the poor, and to make those innovations widely accessible.

European states have a long-standing tradition in securing their citizens the minimum requirements for adequate living standards. The successful eradication of extreme poverty in Western Europe has led to viewing poverty as a definitive harm to human welfare that is unacceptable, and also preventable.

Human rights commitments

Antony Taubman, Director of the Intellectual Property Division, World Trade Organization (WTO), addressed the role of exclusive rights when acknowledging

[154] Presentation slides. Ethical and Social Aspects of Intellectual Property Rights – Agrifood and Health. Conference. Brussels, September 2011 [on file with authors].

intellectual property, namely that society grants a temporary exclusive right for bringing into existence a future public good. Taubman noted that by revising theory and international conventions there is no human right to intellectual property, rather only the right to benefit from the material interests of scientific production (UDHR, art. 27.2).

Some essential liberties are also affected by current IP regimes. We must ask ourselves if and to what level "individualist atomistic innovation" will be favored at the cost of "cumulative, collective innovation of indigenous communities"? Might this constitute a violation of rights, and if so, to which rights? Or, does this simply amount to a lamentable loss of diversity in scientific practices that could be deemed acceptable on utilitarian terms? This inevitably prompts the question of what human goods may be sacrificed for efficiency in technological advancement?

IP rights and the needs of small and medium enterprises and industry

The current IP system has unintended consequences that render increasingly larger-scale players domination in the markets. This has a foreseeable adverse effect on the rate and quality of inventions, and the survival of small and medium size enterprises. In particular, newcomers from the developing world face numerous difficulties.

The Paris convention of 1883 largely set the "rules of the game" for patenting. The late 19th century was an era where differences between bigger and smaller companies were less pronounced, and the implications of biotechnology were yet unforeseeable. We must ask how those rules might be outdated, and what negative costs for public welfare and business opportunities are bound to such anachronistic legislation. We may also question if something similar accounts for *Union internationale pour la Protection des Obtentions Végétales*[155], given that differences in the membership of more and less developed countries are today more varied than in the year that treaty was drafted. This is the conclusion of Orlando de Ponti, former President of the International Seed Federation. The industrial sector has the capacity to provide much of the innovation needed to provide sufficient food for a growing world population, but to do so it needs better access to a broad variety of biotechnology. Specific exemptions in patent laws must be clearly defined in order to not jeopardize future inventions. This clarity could also equalize the highly uneven competition between bigger and smaller companies, and result in enhanced innovative collaboration and cooperation.

[155] UPOV, the first international agreement on plant variety protection, 1961

Biodiversity and traditional knowledge

Yet unresolved are issues such as how should indigenous knowledge be treated, in what way should biodiversity be maintained, and how should biosafety dossiers be regulated? It is important to assess to what extent those issues should be addressed by IP regimes, or to what extent IP regimes have created situations that evoke those issues.

Biodiversity is often seen as something vital, but there are insufficient empirical studies to provide clear evidence in support of such a stance. Success of promoting the conservation (or even enhancement) of biodiversity depends upon the outcomes of such studies. Similarly, claims of the importance of traditional knowledge as a cultural heritage of mankind might not be enough. Rather, what is required is a demonstration of those ways that indigenous scientific practices and knowledge have been or real and meaningful value and innovation. But, can such indigenous practices simply be up-taken into a global R&D effort? It will be evermore crucial to work on gaining indigenous communities as partners for long-term cooperation and not merely as entities to exploit or develop long term dependencies after one-time transactions. Current practices do little to address past errors and to actively gain those communities as cooperation partners – a point well-noted by Bram De Jonge.[156]

Governance

Evidence is urgently needed to define whether current IP systems are efficient, promote innovation and do not unnecessarily limit access or set unacceptable constraints for fostering innovations destined for poorer markets. Ingrid Schneider[157] has focused on the need for evidence on the possible negative effects of current IP regimes, such as the extreme expense in its demand of researchers' time and resources, and the wide contingent of IP experts that must be financed by reallocating funds originally destined for research, development, and product application. Also, the "one-size-fits-all" approach propagated with the TRIPS agreement, is less suitable for innovations in the life sciences than for research and development in the electronic, chemical or mechanical industry.[158] We cannot just balance business opportunities lost in one area in favor of another; to be sure, a detailed assessment of the unused potential to secure human rights is required. Anything that counts as a setback from the realization of human rights must be approved by those who are subjects of those rights, i.e.,

[156] For his position on Benefit-Sharing see De Jonge (2011)
[157] cf. Schneider (2009)
[158] Although those areas are also not immune to criticism, see Bessen and Meurer (2008), chap. 3.

the human beings involved as shareholders in such decisions about and applications of science and technology research and development.[159]

Worries about the actual negative impact of data exclusivity in biosafety dossiers are also a factor in the discussion. Here not only issues like ever-greening of exclusive rights come in, but also the repetition of clinical trials using human subjects in which medicines are tested, not to show their safety, as has been already done, but to have additional data that are not protected in order to secure sales permissions as a generic manufacturer, and repetition of tests using animal subjects which are becoming harder to justify.

A clearer division of labor and confinement of tasks between the different stakeholders is necessary. Competition law, careful examination of patents, filing appeals to seemingly unjust patents, making use of 'flexibilities' as formulated in the TRIPS agreement, are all tools to counteract the negative effects of IP regimes, which must be used by governmental and civil society experts to counteract the misuse of power relations and balances. For example, in the European Union (EU), a better cooperation between EU and the European Patent Organisation (EPOrg) is desirable to compensate for fragmentation due to national patent offices, and can be achieved by a relatively high degree of harmonization by patent granting via EPOrg.

Participation: Top-down vs. horizontal

Many important stakeholders feel that their interests and voice are not taken into sufficient consideration in the negotiation and drafting of IP laws. Justice demands a fairer distribution of objects of innovation, and an availability of biotechnological solutions for the problems that impact the poorest people of the world's countries. Obviously, however, being able to participate at all levels of the innovation process, and having a say in research agendas remains something completely out of reach for most of the world's population.

Various civil society efforts have been made to foster a wider participation in innovation efforts. As G. Pakki Reddy, Executive Director Agri Biotech Foundation, Hyderabad (India), has noted, a solid example is the Indian Honey Bee Network and its collaborating institutions. Those networks afford a more just distribution of resources, and also stimulate innovation through recognition of the work of small-scale innovators, granting them an opportunity to have wider publicity of their inventions. However, it remains to be seen how far the Indian example of innovation and networking know-how can be transferred to other nations and societies.

[159] cf. UN Committee on Economic, Social and Cultural Rights (1990)

Future policy items

It has become clear that patents exert broader effect, beyond simply the producers of patented technologies and the buyers of end-products. The existence of an object that is made artificially scarce by exclusive rights, which at the same time could alleviate problems of human welfare, is controversial. Similarly, having scientific infrastructure in place to provide technical solutions to many of the problems that afflict developing and underdeveloped nations, while not making full use of it speaks strongly to the need for a wider and more inclusive discourse to address the problems instantiated by current IP regimes.

In the main, we hold that the main questions for this discussion are:

a. What could be a socially desirable balance between the types of IP exclusivities innovative enterprises require, and the inclusive public goods protection such innovations are said to serve? How is this proper balance to be achieved?

b. What old and new ideas (such as Open Innovation and the Access to Knowledge movement) about exclusivities and their optimal integration with the public good and fair invention are interesting and worthwhile for debate, experimentation, and ultimate development and use? What studies should be pursued?

c. In what way(s) can a property rights system become inclusive, not only attending to patent holders, but also to those stakeholders that are affected by the patent system?

d. How can inventions be stimulated that are specifically designed to alleviate urgent problems and to reach global targets, such as the millennium development goals and caps in gas emissions that affect climate change?

e. Why are some flexibilities of the TRIPS agreement regarding human welfare (TRIPS, art. 6) not used in national IP regimes, and why does the full potential of TRIPS seem to be underused? What steps can be taken to ensure better use of those flexibilities?

f. How can ethical principles and values of a nation or a group of nations be protected and what does this mean with respect to a broad

interpretation of the *ordre public* and public policy exemptions to patentability (TRIPS, art. 27.2 and art. 27.3)?

This discourse should be inclusive: involving all parties, not only patent holders, industrial countries and their governmental officials. Moreover, it is important to focus on general challenges, such as the place of IP rights in a pluralist world, rather than on specific situations and environments. We should analyze the greater picture and make an overall judgment.

Future research issues

Five major research issues can make the recommended public discourse and ultimately science and technology IP rights more relevant to current and future conditions in a global economy:

First, taking into account the lack of transparency, and to make the patent system more accessible to non-patent holders, mechanisms should be developed to make public, comprehensible and not misleading all information about patent files. This information should be made publicly available without restricted access.

Second, research is necessary to answer the question how, given the democratization of information, the current IP system can be made more democratic, (e.g., by including the voices of non-patent holders).

Third, research is required into alternatives, complements and other, new ideas to achieve a balanced relation between exclusive entitlements and inclusive ends-in-view that comprise public goods (such as open innovation, Access to Knowledge (A2K), common pools, alternatives and complements to the current IP regimes). Equity and inclusivity should be leading principles, both in intention and outcome (impact).

Fourth, further inquiry is required to examine other, freedom restricting regulations or practices, such as steward regulations concerning biosafety dossiers of patented inventions, which allow owners to keep those dossiers restricted from public access without time limits.

Fifth, research is needed to assess the social and technological impacts of current IP systems and of alternatives, taking into account inter alia questions of stakeholder involvement and how it might prevent power relationships determine unfair use of property systems.

Concluding ethical reflection

Intellectual property rights are a means to an end – and the current regime is only one of many conceivable systems of incentives. The current regime can be praised for bringing out many inventions that have benefited a wide public, but the IP system also faces a serious charge of sustaining a specific culture of developing products and doing scientific work that may be directly at odds with the needs and vulnerabilities of a significant number of people. If this charge is indeed related to the current IP regime, we have to ask ourselves what responsibilities and duties arise to mitigate and remedy this effect. Part of this charge claims that the current IP regime is privatizing the very building blocks of further research and development – components that were once part of the commons. The public domain, in contrast to the private domain, may in fact be a locus of much more diverse forms of creativity that also ensure a plurality of ideas, traditions, and translations.

Antony Taubman stated during the conference that "IP law or treaty may be greater than the sum of its parts". We can see this in *ordre public* clauses in patent law that are conceptualized to avoid the creation of incentives that create objects that are socially undesirable, and/or are perceived to be offensive by the general public. During this last decade, the world is coping with disastrous effects of financial hubris on public welfare, and economic rationality is evermore widely seen as secondary to social and political welfare. Moreover, the old concept of *ordre public* may need to be revised and expanded, parallel to the way public morality has expanded from a set of values and duties that only were valid for a smaller community, to the now more predominant cosmopolitan sense of justice. The IP regime must do justice to this sense of public morality because is dependent upon civil support. Here we inevitably confront the question of who shall be the moral gatekeeper in deciding what are "good" exclusive rights and what are "bad" exclusive rights. It may be that the democratization of the current IP regimes is a first step to respond to this problem.

5.

Intellectual property and global health: from corporate social responsibility to the access to knowledge movement

(with Henk van den Belt)

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Abstract

Any system for the protection of intellectual property rights (IPRs) has three main kinds of distributive effects. It will determine or influence: (a) the types of objects that will be developed and for which IPRs will be sought; (b) the differential access various people will have to these objects; and (c) the distribution of the IPRs themselves among various actors.

What this means to the area of pharmaceutical research is that many urgently needed medicines will not be developed at all, that the existing medicines will not be suitable for countries with a precarious health infrastructure or not target the disease variety that is prevalent in poorer regions. Such effects are commonly captured under the rubric of the "10/90 gap" in biomedical research. High prices will also restrict access to medicines as well endanger compliance to treatment schemes. IPRs are mainly held by multinational corporations situated in the developed world, which not only raises egalitarian concerns, but also severely limits the possibilities of companies in poorer countries to realize improvements on existing inventions, as they cannot financially afford to secure freedom to operate, which systematically shrinks the number of potential innovators.

Those inequities lead to an enormous burden for the global poor and since no institution is willing to assume the responsibility to fulfil the right to health and the corresponding right of access to essential medicines, we have to analyse alternatives or additions to the actual intellectual property regimes in order to create new incentives to fill this gap.

Keywords: global justice; intellectual property rights; access to medicines; innovation policy; neglected diseases

Introduction

For slightly more than a decade, the recognition has become increasingly common that there may exist a deep conflict between intellectual property rights (the collective name for a set of rights encompassing patents, copyrights, trademarks, plant breeders rights and the like) and basic human rights. In their campaigns for access to essential medicines, for example, civil-society organizations like Médecins Sans Frontières (MSF) and Oxfam invariably insist that patents should never be put before the human right to health. Likewise, in 2005 Brazil and Argentina and other developing countries supported their proposal to broaden the narrow mandate of the United Nations (UN) agency WIPO (World Intellectual Property Organization) by arguing that "under no circumstances can human rights – which are inalienable and universal – be subordinated to intellectual property protection"[160]. The Adelphi Charter on Creativity, Innovation and Intellectual Property that was issued in October 2005 also declared that "[IP] laws must serve, and never overturn, the basic human rights to health, education, employment and cultural life"[161]. And as a final example: The UN special rapporteur on the right to food, Olivier De Schutter, used the human right to adequate food as a normative yardstick for assessing the effects of patents and other IP rights in the field of agriculture and nutrition[162].

The human rights that are often invoked against certain IP rights are enshrined in such classical documents as the UN Universal Declaration of Human Rights (UDHR) of 1948 and the UN International Covenant on Economic, Social and Cultural Rights (ICESCR) of 1966. The human right to health is encompassed in a rather broad article of the Universal Declaration: "Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control"[163]. The International Covenant gives a more specific formulation: "The States Parties to the present Covenant recognize the right of

[160] World Intellectual Property Organization (2005) 17.
[161] RSA (2006)
[162] De Schutter (2009)
[163] Universal Declaration on Human Rights, 25.1 (1948).

everyone to the enjoyment of the highest attainable standard of physical and mental health"[164]. Rights to participate in cultural life and to share in the benefits of the advance of science are also formulated in both human rights documents. Thus the Universal Declaration states in article 27.1: "Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits"[165]. However, the tenor of this paragraph seems to be counterbalanced by the very next paragraph: "Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author"[166]. This might be seen as providing a justification for IP rights as themselves based in fundamental human rights, thus creating a (potential) tension with the human rights of participation and sharing that are stated in the first paragraph. The same tension recurs in the International Covenant: "The States Parties to the present Covenant recognize the right of everyone: (a) To take part in cultural life; (b) To enjoy the benefits of scientific progress and its applications; (c) To benefit from the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author"[167].

To escape from the legal deadlock in which one set of human rights might seem to negate another set of human rights, the precise status of IP rights definitely needs to be clarified. Some would argue that such rights must indeed be recognized as fully-fledged human rights, even to the point of overriding any possible claim of patients to have access to essential medicines[168]. However, in 2005 the Committee on Economic, Social and Cultural Rights issued an interpretative comment which cautioned against equating the human right recognized in ICESCR 15.1.c (and in UDHR 27.2) with intellectual property rights as defined in national laws and international agreements. According to the Committee, human rights are "fundamental, inalienable and universal entitlements belonging to individuals and, under some circumstances, groups of individuals and communities", whereas IP rights are "first and foremost means by which States seek to provide incentives for inventiveness and creativity" and IP regimes "primarily protect business and corporate interests and investments"[169]. In short, it would be wrong to grant legally recognized IP rights the full dignity of basic human rights[170].

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[164] International Covenant on Economic, Social and Cultural Rights, 12.1 (1966).
[165] Universal Declaration on Human Rights, 27.1 (1948).
[166] Universal Declaration on Human Rights, 27.2 (1948).
[167] International Covenant on Economic, Social and Cultural Rights, 15.1 (1966).
[168] Cass (2009)
[169] UN Committee on Economic, Social and Cultural Rights (2006)
[170] See also Chapman (2009); for a criticism of the Committee's interpretative comment, see Millum (2008).

The awareness that IP rights might sometimes clash with basic human rights such as the right to health and the derivative right of access to essential medicines is of fairly recent origin. It is apparent that the issue of a potential conflict was not foremost on the minds of those who were involved in the formulation of the international human rights charters. This general lack of awareness can be attributed in part to the so-called "Westphalian assumption" that it is the national government of each and every country which is primarily responsible for the protection of the human rights of its citizens. Although increasingly contested in recent years, this assumption has been the dominant and often taken-for-granted axiom in international affairs throughout the entire United Nations period. Moreover, before the conclusion of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) in 1994 as part of the overall WTO package, the design of national intellectual property laws was largely left to the needs, desires and insights of the government of each country. Thus, for example, national governments could, if they wished, exclude pharmaceutical products from patent protection. All of this changed with the arrival of the TRIPS agreement, which imposes relatively high minimum standards of protection for intellectual property rights on all WTO member states. The TRIPS agreement mandates for example that, with few exceptions, "... patents shall be available for any inventions, whether products or processes, in all fields of technology"[171]. Countries like India and Brazil that had previously excluded patents for pharmaceutical products (allowing patents on pharmaceutical processes only), were obliged to introduce new legislation by 2005 to allow the patenting of pharmaceuticals (Brazil complied with this requirement already in 1996, India in 2005). More generally, TRIPS created for the first time a *de facto* global IP regime. Only after the establishment of such an international system of protection of intellectual property rights could concerns about human rights and *global justice* vis-à-vis patents and other forms of intellectual property be sufficiently elaborated. A new institutional arrangement on a global scale was needed for such concerns to attain more articulation and a sharper focus. However, it would take some time before these concerns assumed more definite shape.

As a preliminary to the subsequent discussion, we will set out the very useful threefold perspective that has been introduced by the American philosopher Matthew Wayne DeCamp for the ethical scrutiny of IP systems. Any system for the protection of intellectual property rights or IP regime, DeCamp points out, has three main kinds of distributive effects. It will determine or influence: (a) the *types of objects* that will be developed and for which IPRs will be sought; (b) the differential *access* various people will have to these objects; (c) the *distribution of*

[171] Agreement on Trade-Related Aspects of Intellectual Property Rights, 27.1 (1994).

the IPRs themselves among various actors[172]. Because of these distributive effects, any IP regime can be judged from the angle of (distributive) justice. The claim that it is simply the purpose of an IP system to maximize innovation does not provide an exemption from ethical evaluation, as no regime is distributionally neutral. As we have at present a global IP regime, or at least the incipient forms of a global regime, the relevant standards of judgment must be derived from a credible conception of *global justice*.

There are diverging views on global justice, but a common ground between the most important views is a shared recognition of the importance of *basic human rights*[173]. This means that we can pragmatically use internationally recognized and codified human rights (as defined in UDHR and ICESCR) as a proxy criterion for assessing IP systems in terms of their compatibility with global justice. When discussing pharmaceutical patents, for instance, we would obviously want to refer to the human right to health as codified in UDHR 25.1 and ICESCR 12.1, and the derived human right of access to essential medicines. A relevant distributive effect of the current international IP system relates to the prices of the lifesaving drugs it generates, and hence their affordability for various categories of patients. This effect concerns DeCamp's second dimension (b). But we could also wonder what type of innovations will be promoted by the present system: will it primarily stimulate the development of lifestyle drugs like Viagra and remedies against baldness or rather encourage the development of medicines for conditions that afflict the lives of the global poor? This question refers to DeCamp's first dimension (a). This distributive effect is also a hot issue in the international debate on pharmaceutical patents and access to essential medicines. What is often overlooked in the debate, however, is the relevance of DeCamp's third dimension, the distribution of the IPRs themselves. When the IP system functions in such a way that almost all exclusive rights end up in the hands of a few big multinational corporations headquartered in western countries, such an outcome might also be problematic from a global justice angle, even if the performance of the IP system on the two other dimensions were fully satisfactory. Here, other basic human rights beyond the right to health may be at stake, such as the right to take part in cultural life and to share in the advancement of science. Concerns about capacity building can also be subsumed under this rubric.

The TRIPS Agreement and the HIV/AIDS crisis

The TRIPS Agreement was the culmination of years of intensive lobbying by a (predominantly US) coalition of business firms in such IP-intensive industries as pharmaceuticals, software, agricultural chemicals and biotechnology, and the

[172] DeCamp (2007) 50f. and 315-317.
[173] DeCamp, ibid., 253.

music and movie sector[174]. In the early 1980s Pfizer's CEO Edmund Pratt was a key figure in building this coalition. The very notion of 'intellectual property' was instrumental in bringing the interests of patent holders (e.g. the pharmaceutical industry) and copyright holders (e.g. the music and movie industry) together under one umbrella[175]. The IP coalition thundered against what it considered the "theft" of US-owned intellectual "property" abroad. The unauthorized copying of Hollywood movies and the production of generic equivalents of patented medicines, even if perfectly legal according to foreign laws, were labeled as "piracy" and "stealing from the mind". The IP coalition used its privileged access to policymakers to institute policies destined to end such practices. By threatening trade retaliations (denying access to the American market), the US government brought enormous pressure to bear on recalcitrant foreign countries that showed insufficient respect for IPRs, in the end more or less forcing them to accept the terms of the TRIPS Agreement. For the IP coalition the insertion of the protection of intellectual property into the WTO framework was of strategic importance, as it would allow sanctioning non-compliant countries with punitive damages. Thus the TRIPS Agreement has real teeth. No wonder then that a leading figure in the pro-IP business coalition, Jacques Gorlin, could declare: "we got 95% of what we wanted"[176]. The remaining 5% that they did not get relate to the transition period that the TRIPS Agreement granted to developing countries for introducing product patents for pharmaceuticals and the perhaps somewhat ambiguously defined options for compulsory licensing that the agreement still retained (in articles 30 and 31), a crucial element of the so-called "TRIPS flexibilities" (ibid.).

Ethical judgments about the TRIPS Agreement vary. Bruce Lehman, president of the International Intellectual Property Institute and commissioner of the US Patent and Trademark Office during the Clinton Administration, holds that "the TRIPS Agreement was intended to create a more equitable system of international trade"[177]. The philosopher Thomas Pogge, by contrast, arrives at a strongly negative judgment: "The TRIPS Agreement and its imposition are plainly unjust and will, in terms of the magnitude of harm caused, number among the largest human rights violations in history"[178]. No less critical is economist Joseph Stiglitz: "When the trade ministers signed the TRIPS agreement in Marrakesh in the spring of 1994, they were in effect signing the death warrants on thousands of people in sub-Saharan Africa and elsewhere in the developing countries"[179].

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[174] See Drahos and Braithwaite (2003), and Sell and Prakash (2004).
[175] Kapczynski (2008).
[176] Sell and Prakash (2004) 160.
[177] Lehman (2003) 6.
[178] Pogge (2008a) 76.
[179] Stiglitz (2008) 1701.

It was the worldwide HIV/AIDS crisis that would put the TRIPS Agreement to a severe test in the years around the turn of the millennium. There is no cure for HIV/AIDS, but in 1996 medical researchers discovered that the progressive advance of the disease could be effectively controlled by a combination treatment of three different antiretroviral (ARV) drugs. The annual cost of the use of the three patented medicines together would be between 10,000 and 15,000 US dollars per patient. Such costs could perhaps be affordable in wealthy countries with robust health insurance systems, but would surely be out of reach for developing countries. In 1997 South Africa passed a new Medicines Act, which would allow the Minister of Health to initiate compulsory licensing or parallel importation of HIV/AIDS drugs. Thereupon 40 international pharmaceutical companies (and the Pharmaceutical Manufacturers Association of South Africa) filed a lawsuit against the South African government, claiming that the new law breached the TRIPS Agreement and even the constitution of the Republic of South Africa. The US government exerted additional pressure by placing the country on the so-called "Section 301 Watch List" (enumerating countries that "misbehave" in the IP area as potential targets for retaliatory measures). The European Union also increased the diplomatic pressure. The initiative of Big Pharma led to a strong backlash, however, after HIV/AIDS activists mobilized international public opinion against the lawsuit, which turned into a PR nightmare for the pharmaceutical companies. It also caused the US and EU authorities to withdraw their support[180].

A decisive turning point in the evolving drama occurred in January 2001, when the Indian generics manufacturer Cipla offered to sell the triple-therapy cocktail to Médecins Sans Frontières for 350 US dollars per patient per year[181]: "Cipla's dramatic price reduction, which received widespread media attention, hammered the message home that the multinational drug companies were abusing their monopolistic position in the face of a catastrophic human disaster. It also focused attention on the effects of generic competition in bringing drug prices down"[182]. In April 2001, the pharmaceutical companies dropped their lawsuit against the South African government. The same month UN Secretary-General Kofi Annan announced the creation of the Global Fund to Fight AIDS, Tuberculosis and Malaria. The price drop also led the international policy-makers to change course: earlier they had approved the use of donor funds only for prevention, but not for treatment[183].

Finally, in November 2001 the WTO Ministerial Conference assembled in Doha, Qatar issued the famous Declaration on the TRIPS Agreement and Public Health (or Doha Declaration), stating that "the Agreement can and should be interpreted

[180] 't Hoen (2009) 21.
[181] see Sell and Prakash (2004) 162, and Love (2009) 17.
[182] 't Hoen (2009) 25.
[183] Love (2009) 16f.

and implemented in a manner supportive of WTO Members' right to protect public health and, in particular, *to promote access to medicines for all*" (our italics). This was at least an ideological victory for the access-to-medicines campaign waged by MSF, Oxfam and several other organizations. Unfortunately, it did not mean that in actual practice developing countries would henceforth be free to use the "TRIPS flexibilities" such as compulsory licensing to the full without having to fear any retaliations from more powerful countries.

Access to medicines: a contested terrain

The worldwide HIV/AIDS crisis has brought the problem of access to life-saving medicines into sharp relief, much to the dismay of the (non-generic) pharmaceutical industry. Drug companies resent the one-sided focus on patents and high drug prices as a major obstacle to access. A more impartial investigation of the situation in developing countries, they insist, would show that access to medicines is actually impeded by a great variety of factors, such as lack of an adequate infrastructure, lack of well-equipped hospitals, lack of well-trained doctors, nurses and pharmacists, lack of clean water and adequate storage capacity, lack of good governance, and so on and so forth – in short, an endless array of factors that can be summed up in the one underlying factor of extreme poverty. Thus the international pharmaceutical industry holds that it is inappropriate and unfair to concentrate on intellectual property protection as if this were the single or decisive factor impeding access to essential medicines. A report issued by the International Intellectual Property Institute (IIPI) in 2000 even stated categorically that "the intellectual property rights and the TRIPS Agreement are not, in themselves, impediments to the availability of HIV/AIDS therapies in sub-Saharan Africa"[184]; the focus on patents tended to divert attention away from the "real factors" constraining the availability of and access to drugs in this region. The position that patents do not constitute a major obstacle for access to essential HIV/AIDS drugs in sub-Saharan Africa was further elaborated in an academic article by Amir Attaran and Lee Gillespie-White[185]; Amir Attaran[186] put the argument in the general form that patents do not impede access to essential medicines for all sorts of diseases in the developing world as a whole. However, the methodological assumptions of this work have been severely criticized by NGOs involved in access-to-medicines campaigns[187].

In debates on access to medicines, representatives of the non-generic pharmaceutical industry constantly reiterate their mantra that the big problem

[184] International Intellectual Property Institute (2000) 54.
[185] Attaran and Gillespie-White (2001)
[186] Attaran (2004)
[187] Consumer Project on Technology et al. (2001)

is not patents but poverty[188]. Yet there is something disingenuous about this way of framing the problem. By blaming lack of access on the root cause of poverty and arguing that an effective solution should address the "real factors" underlying the problem, the proponents of Big Pharma turn the critical spotlight away from their intellectual property rights. It is an easy way to get off the hook, as no one would contest the desirability of more aid and assistance to tackle global poverty – least of all the NGOs campaigning for greater access to medicines. There are indeed more barriers impeding access, but that would be no excuse not to clear the one particular barrier making patented medicines so expensive as to be unaffordable for poor patients and poor countries[189]. As a number of NGOs declared in response to the Big Pharma position: "We agree that donor aid is extremely important, and continue our work to advocate for such aid. But it is entirely irrational, and in our opinion, deeply cynical, to pit donor aid against efforts to overcome patent barriers. Everything possible needs to be done. Every barrier for cheaper medicine needs to be removed"[190].

By robustly protecting their global intellectual property rights and insisting that access to essential medicines should be ensured by increased donor aid rather than by lowering their prices and/or licensing generic manufacturers, pharmaceutical companies effectively shift the burden of solving the access problem onto governments and international donor funds. This approach is vehemently defended by the president of the International Intellectual Property Institute, Bruce Lehman. Thus after first extolling the stimulating effect of the patent system on the development of new medicines, Lehman refuses to blame the same system for the high drug prices: "None of the new drugs in the pipeline, much less the 74 medicines that already have caused deaths from AIDS to plummet in the United States, would have come into existence without the patent incentive and the prospect of a return on investment provided by that incentive. This is not to dismiss the fact that many patients in the world cannot pay for these drugs and do not have access to them. *However, this is not the result of the patent system.* It is the result of lack of a source of funding for the purchase of drugs for those currently too poor to buy them themselves"[191]. In other words, high prices for patented drugs are apparently an inevitable fact of nature. Lack of access of the world's poor to such medicines can only be remedied if governments or donor funds are willing to pay the full price for them. Lehman would not be appreciative at all if donor funds like the Global Fund used their limited budgets to purchase much cheaper generics, even if they would thereby reach many more patients[192].

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[188] Leisinger (2009) 7f.
[189] Sell (2007) 45-47.
[190] Consumer Project on Technology et al. (2001)
[191] Lehman (2003) 8, (our italics).
[192] Lehman, idem., 10.

The sad fact, however, is that governments or international charities may sometimes consider the prices of patented medicines prohibitively high to act as a source of funding for the poor. James Love tells us about a meeting he had in 2003 with the Director of the Office of Management and Budget (OMB) under President George W. Bush, Mitch Daniels, who declared that when prices were more than $1,000 per year, the OMB could not justify spending money on AIDS treatment, but that when the price fell below $1 per day, he felt they could not justify *not* spending money on AIDS medicines[193].

The drop in prices for antiretroviral drugs, mainly thanks to increased competition from generic manufacturers, induced US President George W. Bush in early 2003 to launch a major initiative, the Presidential Emergency Plan for AIDS Relief (PEPFAR). In his State of the Union Address of January 28, 2003, he declared:

> "There are whole countries in Africa where more than one-third of the adult population carries the infection. More than four million require immediate drug treatment. Yet across that continent, only 50,000 AIDS victims – only 50,000 – are receiving the medicine they need . . . A doctor in rural South Africa describes his frustration. He says, 'We have no medicines … many hospitals tell [people], 'You've got AIDS. We can't help you. Go home and die.' In an age of miraculous medicines, no person should have to hear those words. AIDS can be prevented. Anti-retroviral drugs can extend life for many years. And the cost of those drugs has dropped from $12,000 a year to under $300 a year, which places a tremendous possibility within our grasp ……. [T]onight I propose the Emergency Plan for AIDS Relief – a work of mercy beyond all current international efforts to help the people of Africa. . . . I ask the Congress to commit $15 billion over the next five years, including nearly $10 billion in new money, to turn the tide against AIDS in the most afflicted nations of Africa and the Caribbean."[194]

For all its generosity the PEPFAR initiative would have been unthinkable were it not for the inroads made by generic manufacturers on the patent monopolies of the world's leading drug companies. In his address to the nation Bush implicitly affirmed the universal right to health and the derivative right of access to essential medicines (note the line: "In an age of miraculous medicines, no person should have to hear those words"). So, for once, the US president did not put patents before patients. His stance represented a remarkable departure from the "patents-are-sacrosanct" position usually adopted by the pharmaceutical industry and also, most of the time, by the US government.

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[193] Love (2009) 18 n. 36.
[194] Bush (2003)

The general thrust of US trade policy during the last fifteen years or so has been to aggressively defend the global IP interests of the pharmaceutical industry. The American government has concluded several bilateral and regional trade agreements containing so-called "TRIPS-plus" provisions aimed at eliminating the "flexibilities" of the TRIPS Agreement and it has also exerted heavy economic and political pressure on Third World countries intent on using these same "flexibilities" (e.g. compulsory licensing) for the sake of protecting public health or promoting access to medicines for all[195]. A case in point is the US response to the decisions taken by the Thai government in 2006 and 2007 to issue compulsory licenses for the production of the first-line AIDS drug efavirenz (Stocrin), the second-line AIDS drug lopinavir/ritonavir (Kaletra) and the antiplatelet drug clopidogrel (Plavix), patented respectively by Merck Sharp & Dohme (the UK subsidiary of the US firm Merck), the US firm Abbott and the European company Sanofi-Aventis. Although these decisions were fully in line with the TRIPS Agreement (as reaffirmed by the Doha Declaration), they were branded by the international pharmaceutical industry as illegal appropriations of private-sector property[196]. US and European ambassadors signaled their strong disapproval of the compulsory licenses to the Thai government. Abbott retaliated by announcing to withdraw all applications to register its new drugs in Thailand. The US Trade Representative placed Thailand under the Special 301 "Priority Watch List Surveillance" and threatened to terminate Thailand's privileges to export to the US market. According to some legal experts, however, it is not the Thai government's resort to compulsory licensing, but the contemplated US reprisal against Thailand that is in contravention of international law[197].

In its conflict with the US government and pharmaceutical companies, Thailand received support from an unsuspected quarter, namely from Bill Clinton. Accompanying the Thai minister of health during her visit to New York in May 2007, the former US president defended Thailand's decision to issue compulsory licenses: "No company will live or die because of high price premiums for AIDS drugs in middle-income countries, but patients may"[198]. For Clinton, affordable drug prices were a life-and-death issue. Since 2002 the William J. Clinton Foundation had been active in making first-line AIDS medicines available to the needy in Africa and elsewhere by striking advantageous deals with generic manufacturers. The relative success of this program created a new financial burden because part of the patients who have been kept alive develop resistance to the first-line drugs and need to be treated by the newer and much more costly second-line AIDS drugs. Typically, patented brand-name versions of the latter

[195] Sell (2007)
[196] Limpananont and Kijtiwatchakul (2010) 442.
[197] Reichman (2009a) 256.
[198] Bill Clinton quoted by Dugger (2007).

are more than 10 times as expensive as the first-line generic drugs, thus causing an enormous strain on the health-care budget. The Clinton Foundation therefore struck new deals with the Indian manufacturers Cipla and Matrix to provide generic versions of second-line AIDS drugs at greatly reduced prices, with average savings of 50 percent in middle-income countries like Thailand. Needless to say that Clinton's initiative was not welcomed by the big multinational drug companies and the US government, but their demurral did not deter him. He criticized Abbott's "hard-line position" over what he considered to be "a life and death matter".[199]

The human rights obligations of pharmaceutical companies

While states have the primary responsibility for realizing the human right to health and increasing access to medicines, other national and international actors, including private business firms, also share in this responsibility. Although pharmaceutical companies normally have extensive Corporate Social Responsibility (CSR) policies in place and often subscribe to the loftiest humanitarian aims in their mission statements (typically placing the relief of human suffering before profits), they generally do not want to be strictly held to account with regard to more specific commitments and obligations.

When the previous UN Special Rapporteur on the right to health, Dr. Paul Hunt, undertook to create more clarity on the human rights obligations of drug companies in relation to access to medicines, he found few firms that were ready to participate in the consultation process and his draft and final guidelines met with negative comments from the pharmaceutical industry[200]. The drug firms felt that the human rights obligations that had conventionally been placed on the nation state (and the international community) were illegitimately shifted onto their shoulders, and they rejected this move: "Most companies will argue that it is not their role to step in when those first in line of responsibility fail to perform their duty"[201]. Let us have a closer look at Hunt's guidelines to see whether or to what extent this response is warranted.

Hunt's definitive list contains no less than 47 guidelines, grouped into 14 themes. Some of the guidelines refer to such general requirements as the need for transparency, monitoring and accountability. It is further held imperative that companies disclose all their advocacy and lobbying activities and their attempts to influence public policy (guidelines 17 and 18). Companies are also called upon to respect the letter and spirit of the Doha Declaration (guideline 27) and not to impede those states that wish to use the flexibilities of the TRIPS Agreement (guideline 28). There are also interesting requirements on licensing and pricing.

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[199] Bill Clinton quoted by Usborne (2007).
[200] See Hunt (2008) and Hunt and Khosla (2010).
[201] Leisinger (2009) 10f.

Thus drug companies "should issue non-exclusive voluntary licenses with a view to increasing access, in low-income and middle-income countries, to all medicines" (guideline 30). With a view to ensuring that a company's medicines are affordable to as many people as possible, the former UN Special Rapporteur suggests that it should adopt differential pricing between countries and within countries (guideline 33), charging lower prices in poorer countries and for poorer patients and communities. Drug companies should also do more research and development on neglected diseases and make public commitments in this respect (guideline 23). Hunt recognizes that drug companies also have a responsibility to enhance shareholder value (preamble) and thus are no charities, but he insists that they should do everything they reasonably can to help realize the human right to health: "The seminal right-to-health responsibility is to take all reasonable steps to make the medicine as accessible as possible, as soon as possible, to all those in need, within a viable business model"[202]. Moreover, companies have to make themselves accountable in this regard by having their efforts to enhance access to medicines monitored and reviewed by independent agencies.

While working on the guidelines, Hunt also undertook a mission in 2008 to the headquarters of the UK-based drug firm GlaxoSmithKline (GSK) to interview several senior managers on the company's policy with regard to access to medicines. GSK is widely recognized as a strong exponent of Corporate Social Responsibility policies within the pharmaceutical industry. In 2008 it ranked first on Access to Medicine Index and in 2010 it came out on top again. As GSK's policy might be considered as constituting 'best practice' in this area, Hunt's findings are particularly interesting[203]. While he thinks some aspects of GSK policy are indeed admirable and commendable, he still concludes that across the board the company fails to live up to its human rights obligations. GSK does quite a lot of research on so-called "neglected diseases" with special relevance to developing countries. The company also has made a commitment to offer its antiretrovirals and anti-malarial treatments to least-developed countries and all of sub-Saharan Africa at not-for-profit prices (which cover costs including insurance and freight). These price reductions are in line with GSK's right-to-health responsibilities, but Hunt observes that they have been forced by competition from generic producers: "Crucially, generic competition played a vital role in driving down these prices. In most cases, generic companies have pushed their prices below the NFP [not-for-profit] prices of innovator companies"[204]. The former UN Special Rapporteur also notes that the price of GSK's HPV (human papilloma virus) vaccine against cervical cancer, Cervarix, remains so high (US $ 300) as to be beyond the reach of most people in

[202] Hunt and Khosla (2010) 2.
[203] Hunt (2009)
[204] Hunt (2009) 18.

developing countries.[205] Although GSK grants licenses for some of its products in some markets, Hunt holds that the company is too reluctant to use this instrument and that it should enter into voluntary licensing (both commercial and non-commercial) on a much wider scale across a range of medicines and markets. GSK has also experimented with a new marketing approach of differential pricing between countries and within countries. This approach would hold much interest and promise, Hunt remarks in his report, if it could be extended considerably beyond its present far too modest scale. Hunt is also critical of GSK's lobbying activities to discourage the full use of the TRIPS flexibilities by countries like India, Indonesia and the Philippines and its support for the inclusion of "TRIPS-plus" provisions in bilateral and regional free trade agreements. Finally, the company has not lived up to standards of accountability by failing to provide for external review of its *Corporate Accountability Report* for 2008.

Hunt's recommendations (not to say prescriptions) to GSK and the pharmaceutical industry in general are based on the assumption that drug firms have definite human rights obligations in relation to access to medicines. It is precisely this assumption that is bluntly rejected by the pharmaceutical industry. In this regard GSK's response to Hunt's report on the company's policies is highly significant: "The 'right to health' is an important issue, though not well defined, especially as it relates to non-state actors. Therefore we do not accept the suggestion – implicit in the development of this Report – that GSK's programme

[205] Hunt states in his report: "As a patent holder of a life-saving medicine, GSK has a right-to-health responsibility to do all it reasonably can to put in place, as a matter of urgency, mechanisms that enhance access to Cervarix in middle-income and low-income countries […]", Hunt (2009) 18. However, beyond being financially unaffordable, Cervarix is also not the most appropriate HPV vaccine for use in developing countries. The same holds for the other HPV vaccine that is currently on the market, Merck's Gardasil. Both vaccines have actually been designed and developed with a view to be used in developed countries. They are expensive to produce; require refrigeration and a cold chain for storage; they require delivery by intramuscular injection in three doses over a six-month period; they work against HPV16 and HPV18, but not against virus variants such as HPV35 that are more prevalent in sub-Saharan Africa; they may be less effective in women with other infections (like HIV); their ideal target group is females in early adolescence, but this may make them culturally inappropriate in some developing countries. For all these reasons, Cervarix and Gardasil are not optimally designed for use in developing countries, despite the fact that more appropriate alternative options would have been possible, see Intemann and de Melo-Martín (2010). Thus, these two HPV vaccines not only illustrate the problem of access to existing medicines or vaccines due to their high prices, but also show the biased orientation of the global R&D effort towards the demands of affluent markets. It is not just that HPV vaccines are "largely unaffordable where [they are] most needed", Hunt (2009) 18; as Hunt notes, but *appropriate* forms of HPV vaccines are not even *available* where they would be most needed.

and ongoing commitment is in any way required by international legal norms, whether in the human rights or other areas."[206]. In other words, the company prefers to see its Corporate Social Responsibility policies as "good works" that are supererogatory and not required by international legal norms. The implication is that a pharmaceutical company cannot be held to account for not living up to any alleged human rights obligations in relation to access to medicines.

GSK's position is in fact representative for the entire pharmaceutical industry. The editors of *PLoS Medicine* argue that pharmaceutical companies "blunt their own responsibilities by instead emphasizing their corporate social responsibility initiatives" and that by persistently claiming that "the primary responsibility for delivering the right to health lies with the State" the industry allows "to exculpate itself from its own human rights responsibilities"[207]. Business ethicist Richard De George also points out that the Corporate Social Responsibility initiatives in which pharmaceutical companies engage seem to imply that they are not to be held accountable for failing to live up to any commitments: "In their various programs, many pharmaceutical companies give a variety of drugs away free to the needy, be they AIDS victims in Africa or poor people in the United States. These are most often presented as meeting part of the company's social responsibility. So framed, it sounds as if these are voluntary, non-obligatory programs that the companies adopt as good citizens or through their philanthropic foundations. They might be considered supererogatory, or good works that are not required, and ones for which they deserve praise; but failure to engage in them would deserve no blame. This approach puts the actions of pharmaceutical companies in the realm of charity, and portrays them as generous and caring"[208]. The language of social responsibility, he also observes, "carries with it no non-self imposed obligations and so no broader accountability beyond what the company defines its responsibility to be"[209].

Pharmaceutical companies often cite the reduced prices for antiretrovirals or other essential medicines that they charge in developing countries, or their willingness to engage in differential pricing schemes on a case-by case basis[210], as proof of their good intentions to help enhance access to medicines. It is doubtful, however, whether such price reductions are always of an entirely voluntary nature. In many cases, as Paul Hunt also pointed out in his report on GSK, prices have been driven down by increased competition from generic producers and pharmaceutical companies were simply forced to follow suit (although Hunt noted that GSK's not-for-profit prices were still above the prices of generic versions). It might be naïve to expect that drug companies would

[206] GlaxoSmithKline (2009)
[207] PLoS Medicine Editors (2010)
[208] De George (2005) 557f.
[209] De George, idem., 557.
[210] Leisinger (2009)

introduce drastic price reductions entirely on their own accord, without being pressed to do so by strong external forces. In their study of Brazil's successful policy of securing access to low-cost AIDS medication, William Flanagan and Gail Whiteman also show that pharmaceutical companies were only willing to concede drastic price reductions in the face of strong pressure from NGOs and especially from the Brazilian government, which credibly used the threat of compulsory licensing. They conclude: "Action undertaken in terms of voluntary CSR alone may be insufficient"[211].

In view of the fact that pharmaceutical companies generally reject the notion that they have definite obligations flowing from the human right to health and that their CSR initiatives are often just a reaction to NGO campaigns and other external pressures, it would seem that a direct moral appeal to their sense of social responsibility is not the best approach to realize global justice with regard to access to and availability of medicines. One may also insist that "all pharmaceutical companies have a responsibility to take reasonable measures to redress the historic neglect of poverty-related diseases"[212], and it would of course be nice if companies would do more research on "neglected diseases", but this moral appeal remains rather futile as long as the profit opportunities of wealthy markets exercise a powerful pull in the contrary direction. It might be too much to expect that companies, which also have a responsibility to enhance shareholder value, would resist this pull.[213] In short, a more structural approach may be called for.

Thomas Pogge and the Health Impact Fund

The German philosopher Thomas Pogge has thought long and hard about the working of the international patent system from the perspective of global justice. He is also concerned about the human right to health, but he thinks it is inappropriate and unhelpful to assign the responsibility for realizing this right to national states or to individual business enterprises. Instead, he holds that this right is to be secured by a just global institutional order. Pogge also holds that the right of access to essential medicines, as a derivative of the right to health, not only demands that existing essential medicines are accessible to all, but also that a fair allocation of research efforts ensures that work is being done on the right kind of diseases (e.g. also for life-threatening diseases that are currently being "neglected" due to lack of profitable markets). Thus Pogge pays special

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[211] Flanagan and Whiteman (2007) 65.

[212] Hunt (2009) 23.

[213] Here is a concise expression of this viewpoint: "Pharmaceutical companies prosper by catering to the affluent; and they would be violating their responsibilities to their shareholders if they purposefully served poor patients at the expense of their bottom line." Hollis and Pogge (2010) 12.

attention to the first two distributive effects of IP systems distinguished by DeCamp: (a) the *types of objects* that will be developed and for which IPRs will be sought; and (b) the differential *access* various people will have to these objects[214]. What is more, Pogge holds that any attempt to re-design the international patent system according to principles of global justice has to deal with these two dimensions together and to solve the twin problems of availability and access *simultaneously*. Any solution alleviating the one problem at the expense of aggravating the other must be avoided.

Pogge starts with a fairly conventional economic analysis of the role of patents. Patents are intended to address a well-known "market failure", namely the lack or insufficiency of innovative activities on the part of firms in the absence of legal protection for the results of their efforts. If any inventions could be easily copied by "free riders", firms would not be able to recoup the expenses incurred in their innovative efforts and would therefore have no incentive to engage in such pursuits in the first place. The patent system helps to overcome this problem by providing the inventor a temporary monopoly on the use of the invention for which he is granted a patent, currently for a period of 20 years from the date of filing the patent application. This amounts in effect to solving one "market failure" (the undersupply of innovations) by creating another "market failure"[215]. As any economics textbook explains, a monopoly will lead to a static inefficiency or welfare loss that is known as a "deadweight loss". A patent on a drug allows the patent holder to charge what the market will bear, that is, to set the price at the level where his profits will be maximized. Because the monopoly price is so much higher than the marginal cost price, this will prevent transactions with all those potential users who are able and willing to pay more than the marginal cost but not the full monopoly price of the patented medicine. Some quantitative calculations indicate that the deadweight loss in the US pharma market may be no less than 60 percent of sales revenues and that the relative share in developing country markets may be even higher[216] – thus it is clear that, simply in economic terms, enormous amounts are involved. In the case of patents for essential, life-saving medicines, this "market failure" leads to morally unacceptable situations, as deadweight losses in economic terms translate here to dead bodies in human terms.

In theory, the deadweight loss of a monopoly could be mitigated or even overcome if the monopolist were able to charge different prices for different customers, according to their respective ability and willingness to pay, instead of charging a single price for all customers. This solution requires that the monopolist can differentiate his customers into different "classes" and also that any re-sale of the product between these different "classes" can be prevented –

[214] See DeCamp (2007) 50f.
[215] Pogge (2005) 186.
[216] Grootendorst (2009)

conditions that in practice may be extremely hard to fulfill[217]. Nonetheless, we have seen that the former UN Special Rapporteur on the right to health, Paul Hunt, strongly urged pharmaceutical companies to use differential pricing schemes, both between and within countries, on a wide scale in order to fulfill their human rights responsibilities. Some drug firms have indeed made modest attempts in this direction (examples are GSK and Novartis), but most are very reluctant to engage in deliberate price differentiation at all for fear of spoiling their markets in affluent countries. It is not just that they are afraid that medicines will be diverted from low-price markets in poor countries to high-price markets in rich countries. It is also because of the practice of *reference pricing*: "some high-income and middle-income countries try to use, as benchmarks for the prices at which they buy, the preferential prices offered to low-income countries"[218]. For all these reasons Pogge concludes that differential pricing is not a workable solution to the deadweight-loss problem, or in other words, to the problem of access to essential medicines[219]. He also holds that it is unreasonable to expect drug companies "to systematically lower prices in developing countries on the basis of altruism"[220]. In his eyes it is even unfair to impose such a requirement on the pharmaceutical industry "when other industries (which do nothing for poor people) have no such expectations placed on them" (ibid.).

It thus becomes apparent that Pogge does not wish to go along with all those NGOs that relentlessly continue to press pharmaceutical companies to lower their prices in developing countries ever further in the belief that this is the right way to proceed in the search for solutions to global health problems. He also highlights the limitations of compulsory licenses, noting not only the fierce opposition of the pharmaceutical industry and the risk of political retaliation but also pointing out that their widespread use might undermine the incentivizing effect of patents: "But [..] compulsory licensing, especially if it were to become more common, brings back the first market failure of undersupply: Pharmaceutical companies will tend to spend less on the quest for essential drugs when the uncertainty of success is compounded by the additional unpredictability of whether and to what extent they will be allowed to recoup their investments through undisturbed use of their monopoly pricing powers"[221]. It is almost as if we hear the well-known mantras of the pharmaceutical industry. Drug firms also tend to emphasize that it is incorrect to look at the prices of patented medicines only from a static point of view. After all, patents are temporary monopolies that are precisely intended as incentives to stimulate the search for new medicines. No patents, no innovation. Higher prices in the

[217] Lipsey and Steiner (1972) 258-263.
[218] See Hunt (2009) 16 and also Hollis and Pogge (2008) 85.
[219] See Pogge (2005) 187 and Hollis and Pogge (2008) 98f.
[220] Hollis and Pogge (2008) 95.
[221] Pogge (2005)188 and see also Hollis and Pogge (2008) 99f.

present (until the competition of generics after the expiration of the patent brings them down), the industry argues, are simply the "price" we all have to pay to enjoy the fruits of progress. A substantial erosion of price margins might well endanger pharmaceutical innovation.

Pogge agrees that one should not consider the problem exclusively from the point of view of static efficiency but also take into account the dynamic role of the patent system to foster innovation. In so far he subscribes to the industry position. However, one cannot simply trade off static efficiency (wide access to existing medicines) against dynamic efficiency (innovation). Pogge insists that access to essential medicines is a human right that is to be secured by a just international system. This human right cannot be sacrificed on the altar of pharmaceutical innovation. Even more, when looked at from a dynamic perspective, the international patent system does not meet the requirements of global justice either: it generates innovations, indeed, but it does not generate the right kind of innovations. As financial incentives, patents operate by orienting research towards the needs of the wealthy and the affluent, that is, those who exercise effective demand backed up by purchasing power, and not towards the needs of the poor and needy who are unable to do so. The result is an enormously skewed distribution of the global pharmaceutical research effort. The well-known "10/90 gap" illustrates this effect: "Only 10 percent of global health research is devoted to conditions that account for 90 percent of the global disease burden"[222]. There are therefore many "neglected" diseases, especially in the Tropics, which fail to receive adequate attention from the international research community.[223]

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[222] Drugs for Neglected Diseases Working Group (2001) 10.

[223] Actually, we use the notion of the "10/90 gap" as a shorthand to denote the skewed allocation of worldwide medical and pharmaceutical research effort over diseases and conditions differentially affecting various parts and populations of the globe. This stylized formula may be appropriate as a first-order indication of global imbalances, but needs to be refined in a more thorough scrutiny of the problem. The WHO's Commission on Intellectual Property Rights, Innovation and Public Health (CIPIH) offers a more sophisticated approach. It distinguishes between *Type I diseases* (incident in both rich and poor countries, with large numbers of vulnerable population in each), *Type II diseases* (incident in both rich and poor countries, but with a substantial proportion of the cases in poor countries), and *Type III diseases* (overwhelmingly or exclusively incident in the developing countries). Diseases that disproportionately affect developing countries would thus by definition be Type II and Type III diseases. However, this approach may be too simplistic, as some Type I diseases (like cardiovascular diseases) may be expected to rise in importance in developing countries while showing decreasing mortality rates in developed countries. As the CIPIH report rightly remarks: "The criterion should be diseases or conditions of significant public health importance in developing countries for which an *adequate* treatment does not exist for use in resource-poor settings – either because no treatment exists whatsoever, or because, where treatments exist, they are

Pogge concludes that any proposal for a re-design of the international patent system in the field of medicines has to solve the access problem (cf. deadweight loss) and the availability problem (cf. the 10/90 gap) simultaneously. He has proposed his own institutional solution for dealing with these two problems, the so-called *Health Impact Fund*, which has been further elaborated with the help of economist Aidan Hollis[224]. Irrespective of how one judges the merits of his reform proposal, Pogge certainly deserves credit for bringing home so clearly that these twin problems define a major part of the task-set for any attempt at institutional re-design.

In Pogge's view, an international public fund based on obligatory contributions (mostly) from developed countries, the *Health Impact Fund*, should be established to create the possibility of rewarding pharmaceutical companies for developing essential medicines, the size of their reward being proportional to the impact of their invention on the global disease burden. In essence, the scheme means that companies are offered a choice. Once they have taken out a patent for a new drug, they can either attempt to earn money on it in the usual way by exploiting the monopoly and setting prices that affluent markets can bear, or they can choose the option of registering with the Fund and being rewarded according to a formula that is geared to the health impact of the new drug (measured in terms of QALYs, i.e. the number of quality-adjusted life years saved worldwide). In the latter case the drug will have to be made available at an administered price that is set by the Health Impact Fund to reflect average manufacturing and distribution cost. In return the registrant will receive, after market approval of the new medicine, annual reimbursements from the Fund that are proportional to the global health impact of the drug for a period of 10 years. (The absolute size of the reimbursements will be determined by the size of the Fund and the measured health impacts of the other registered products.) After this period the medicine will be freely available for generic producers. The second option would entail a different *metric of success* for the drug company. Success will not be measured then in terms of net sales to those who can afford to pay the high prices of a monopolized invention, but in terms of the reduction of the global disease burden, irrespective of the purchasing power of those who suffer from it. In this way it is hoped that the Health Impact Fund will redress the existing imbalance of availability (epitomized by the "10/90 gap") by providing incentives that are not geared to purchasing power but to medical need. Setting an administered price at roughly the level of average manufacturing and

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inappropriate for use in countries with poor delivery systems, or unaffordable" CIPIH (2006) 26.

[224] Hollis and Pogge (2008)

distribution cost will ensure that the problem of access is also addressed, at least for drugs registered with the Fund.[225]

According to Pogge, there is a strong moral obligation for the governments and citizens of affluent countries to support the Health Impact Fund (HIF). He holds that the citizens of affluent countries are indirectly responsible for the international institutional order which their governments have the power to impose on the entire world. In his eyes, the status quo of the TRIPS system of IP protection, which "*foreseeably* and avoidably deprive[s] human beings of secure access to the object of their human right"[226], is thoroughly unjust. Given the claim that a large part of these human rights violations *can* in principle be avoided by installing the HIF, the ethical conclusion is that they *should* be avoided: "Maintaining SQ [= the status quo] without the HIF constitutes a massive violation of the human rights of the global poor. So long as there will be poor people in this world – whether in poor or rich countries – who are unable to obtain expensive medicines still under patent, SQ will gravely harm, and kill, many of them"[227]. The SQ + HIF option drastically changes the moral landscape and is even ethically preferable, in Pogge's judgment, to a return to the pre-TRIPS era.[228]

Criticism

Several commentators have questioned the political and practical feasibility of the Health Impact Fund. One critical issue is funding. The whole initiative needs initially some 6 billion dollars from governments or other contributors to take off. Will such funds really be forthcoming and can pharmaceutical companies base their long-term R&D decisions with any confidence on government pledges to provide funds over a longer period of time? "Providing public funds to drug companies is unlikely to be politically popular: competing demands will always seem more urgent and desirable"[229]. It has also been pointed out that the measurement procedure for assessing the impact of a new medicine on the

[225] For a detailed exposition of the whole scheme, see Hollis and Pogge (2008) and Singer and Schroeder (2010).
[226] Pogge (2005) 199.
[227] Hollis and Pogge (2008) 60.
[228] Hollis and Pogge, idem., 54.
[229] Buchanan et al. (2011) 326. This lack of trust in governments' commitments is shared by Philip Hedger, executive managing director of international affairs at Pfizer: "The sustainability of a government-funded reward system has various areas of uncertainty. Governments change, as do their objectives and their funding mandates. Totally unpredicted issues can arise, as the world is currently witnessing. These and more reasons provide plenty of opportunity for governments to review their commitments, whatever the nature of the original agreement." quoted in Schulz (2008).

global disease burden is rather complex, which would make the assessment vulnerable to corruption[230].

In many respects the Health Impact Fund is similar to the *prize fund* that has been elaborated by James Love and others as an alternative system for rewarding pharmaceutical innovation.[231] Love's ideas have also inspired the legislative proposals introduced by US Representative Bernard Sanders from Vermont in 2005 and 2007 to create a Medical Innovation Prize Fund in the United States. The HIF as well as James Love's prize fund aim to break the link between incentives for R&D and product prices, or in other words to separate the market for innovation from the product market. However, there are also important differences. Whereas the HIF allows registrants to retain their IP and only requires them to accept the price to be set at average cost as a condition for being eligible to reimbursements from the HIF, Love's scheme would make the patented invention on registration available to generic competitors through open licensing[232]. The consequence is that this scheme actively harnesses the forces of economic competition to bring the prices of new medicines down. Furthermore, while the HIF is a voluntary *complement* to the existing pharmaceutical innovation system, Love's prize fund ultimately aims to become a complete *replacement*. An obvious drawback of a voluntary system like the HIF is that it would not address the access problem if the patent owner chose the traditional patent monopoly rather than the HIF option[233]. Finally, Love and Pogge also strongly disagree about the role of compulsory licensing. For Love, this option continues to be vital to secure access to medicines in poor countries by relying on the potential of generic competition. Pogge, by contrast, is rather critical of this option and emphasizes that "compulsory licenses weaken the innovation incentives that were supposed to result from the extension of strong intellectual property rights into the less developed countries"[234]. In Love's view, this alleged 'trade-off' between innovation and access is extremely overstated as the potential demand from poor countries does not provide much of an incentive at all, with or without patent protection. Love refers to the report of the WHO's Commission on Intellectual Property Rights, Innovation and Public Health, which concluded that strong global IP protection (without compulsory licensing) is unlikely to boost pharmaceutical research on diseases disproportionately affecting developing countries (i.e. Type II and Type III diseases), given insufficient market incentives.[235] Love fears that Pogge's statements may readily

[230] Sonderholm (2010)
[231] See Love and Hubbard (2007) and see Gombe and Love (2010).
[232] Compare Hollis and Pogge (2008) 105f.
[233] Love and Hubbard (2007) 1535.
[234] See Hollis and Pogge (2008) 54 and also 99f.
[235] CIPIH (2006) 85

play into the hands of patent-owning companies opposing compulsory licensing.[236]

It is a notable feature of Pogge's reform proposal that the whole scheme still relies very strongly on the "incentivizing" effect of patents.[237] The main problem with the present patent system, in Pogge's view, is that the incentives are geared to (potential) market demand in wealthy countries that is backed up by purchasing power. The "trick" of the HIF scheme is to leverage the unmet medical needs of the South by backing them up with additional funds, so that they too carry some weight in the market pull directing pharmaceutical innovation. It is all a matter of setting the incentives "straight" – but by the same token the scheme still counts on the role of patents as incentives. In this regard Pogge's ideas are clearly out of sync with the emerging "A2K" (Access to Knowledge) movement, which radically questions the need for exclusive intellectual property rights as a condition for stimulating creativity and innovation.[238] The success of free and open-source software provides the paradigmatic example for the A2K movement: "The production process of free and open-source software is central to the imaginary of the A2K mobilization because it offers a model of collaborative, distributed innovation that does not rely on the incentivizing effect of IP rights"[239]. Another plank of the "A2K" platform is that "under no circumstances can human rights be subordinated to intellectual property protection"[240]. The A2K movement is however concerned with a wider range of human rights than the right to health and the right of access to essential medicines that constitute the major focus of Pogge's concerns.

The pharmaceutical industry is usually seen as a sector where patents are indispensible for innovation, due to high investment costs of R&D and the relative ease to reverse engineer any resulting product. Lately, however, the presumed "incentivizing" effect of patents even for the pharma sector is increasingly called into question. For one thing, the track record of the industry over the recent period is not particularly impressive (even apart from the global imbalance epitomized in the 10/90 gap). Official figures show that in the last

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[236] Love (2008)

[237] As Singer and Schroeder explain: "The Health Impact Fund leaves intact strong incentives for the pharmaceutical industry around the globe, thereby preserving the TRIPS advantages, whilst mitigating its main challenge, namely to block access to life-saving medicines to the poor. By registering a patented medicine with the Fund, a firm would agree to sell it globally at cost. In exchange, the firm would receive, for a fixed time, payments based on the product's assessed global health impact. The arrangement would be optional and it would not diminish patent rights, it therefore aligns the interests of pharmaceutical companies with the interests of poor patients. Such a win-win situation has to be welcomed!" Singer and Schroeder (2010) 17.

[238] See Kapczynski (2008) and Kapczynski and Krikorian (2010).

[239] Kapczynski (2008) 869f.

[240] Kapczynski (2008) 866.

three decades "the productivity of the pharma R&D enterprise – the number of new molecules brought to market per dollar spent on R&D – has declined markedly"[241]. This productivity slowdown occurred in a period when new technologies like genomics, combinatorial chemistry and knock-out mice were supposed to make the drug discovery process more rapid and more efficient. The conditioned reflex of the pharma industry to a drying pipeline of new inventions is to clamor for more patent protection, but the fact of the matter is that their wishes on this score have been answered rather well during the past decades. Ironically, some hard-boiled economic analyses locate the root of the problem in the patent system itself and the very high profit margins that it generates. Grootendorst sums up the social costs that are caused by the current system of pharmaceutical innovation centered on patents: (1) the costs to the healthcare system of medication non-compliance due to higher drug prices; (2) the resources consumed in the battle over the innovator's profits; (3) the resources spent by the innovator to expand unit sales and extend patents; (4) the increased costs of pharma R&D when this R&D builds on patented upstream discoveries; (5) the distortions in research direction caused by non-patentability of certain compounds; and (6) the administrative costs of the patent system.[242] To this list can be added the unknown but most likely very considerable extent of bias and distortions in the medical literature due to widespread practices like "ghost management" and "publication planning" that result from the dominance of marketing imperatives over the research process.[243] Thus there is every reason to question Pogge's assumption that patents are indispensible as incentives for innovation.

A broader panorama

Looking at Pogge's ideas and proposals through the lens of the emerging A2K movement reveals some conspicuous blind spots. While concentrating his attention on the human right to health (or rather, more narrowly, on the derived human right of access to essential medicines) and on the design of a workable patent-based system that is able to address the twin problems of access to and availability of medicines, Pogge tends to ignore or dismiss other areas of science,

[241] Grootendorst (2009) 2.
[242] Grootendorst, idem., p. 32. In Grootendorst's paper, each of these rubrics of social costs is further specified and discussed in detail. A very interesting category is the second rubric. When a patent allows very high profit margins on a certain drug, this will attract others seeking their share of the spoils. A lot of effort is simply wasted on keeping these rent-seekers at bay: "The innovator will need to spend resources fending off counterfeiters, resellers, competing drug companies (both generic and branded me-toos), and negotiating with and lobbying price regulators and drug insurers …" (idem, p. 32).
[243] Sismondo and Doucet (2010)

technology and culture and other forms of intellectual property that may raise issues of global justice. There is of course no denying that access to essential medicines is extremely important, but it would be rather weird to suggest that it is the *only* issue in which basic human rights are at stake. Proponents of the A2K movement typically bring into play a wider range of human rights, as transpires from the following statement from the Adelphi Charter already quoted above: "[IP] laws must serve, and never overturn, the basic human rights to health, education, employment and cultural life"[244]. The rights to participate in cultural life and scientific advancement are also enshrined in the Universal Declaration (UDHR 27.1) and other official human rights charters. Pogge's narrow focus on the right to health may also explain why he pays no attention to what DeCamp refers to as the third distributive effect of an IP system, beyond the effects on access and availability, namely the distribution of the IPRs themselves[245]. For Pogge it seems to present no particular problem of global justice when most pharmaceutical patents are possessed by a handful of western drug companies. Access to knowledge, however, is crucially about *participation* in the global networked knowledge-and-information economy. The key issue is "whether information production will be primarily centralized and proprietary or whether large parts of it should be decentralized and participatory"[246].

While Pogge may sound fairly radical when he criticizes the restrictive effects of patents on access to medicines, his judgments are rather timid when he occasionally turns to other forms of IP and to other areas of science, technology and culture. He even deems the exclusion brought about by "other categories of intellectual property (for example, software, films, and music)" perfectly "acceptable".[247] Proponents of free and open-source software and of the A2K movement hold a different view. Brazil's former Minister of Culture, Gilberto Gil, saw free software as central to Brazil's collective sovereignty ("a cultural question par excellence") and as an essential contribution to the promotion of skills and knowledge that will enable historically disenfranchised Brazilians to participate in various forms of cultural production such as music, design, publishing, software development and photography.[248] One could think here of the fourth category, called 'Senses, Imagination, and Thought', in Martha Nussbaum's list of central human capabilities, representing a key element of

[244] RSA (2006)
[245] DeCamp (2007) 318.
[246] Balkin (2006)
[247] Pogge (2005) 187. The conflict between participation in scientific advancement in general and the principle behind the Health Impact Fund is further explored in Timmermann and van den Belt (2012b) [here reproduced as Chapter 6] and Timmermann (2012a).
[248] see Schoonmaker (2007) 1015f.

human flourishing.[249] In this connection worldwide access to educational materials and scientific publications, often effectively blocked by copyright protections, also comes to mind as an issue of global justice.[250]

Access to knowledge can refer to four different things: (1) human knowledge (education, know-how, embodied skills); (2) information (news, data, reports); (3) knowledge-embedded goods (KEGs) like drugs and computer software; (4) tools for the production of KEGs (e.g. research tools, materials and chemical compounds, computer programs).[251] Sectors like the multinational biotechnology and pharmaceutical industry try to control the production of knowledge-embedded goods by using IPRs and monopolizing the tools of production. Sometimes, however, attempts are made to wrest control from the hands of the few oligopolistic companies dominating the industry. Special importance in this regard accrues to the initiative taken by the molecular biologist Richard Jefferson to set up *BiOS* (Biological Innovation for Open Society or Biological Open Source) at CAMBIA in Australia. His aim is to make and to keep the basic techniques of agricultural biotechnology, the "tools" and the "technology platforms", accessible to everybody. Freeing the tools from the stranglehold of patents would make the development of numerous potential applications benefiting the poor and needy of the world economically viable. It would also facilitate the active participation of developing countries in the process of biotechnological innovation. Interestingly, in an interview Jefferson declared that "the most fundamental human right is the freedom, or the capability, to make and use tools to solve problems"[252].

It might seem just wishful thinking to expect that in the foreseeable future developing countries could build the capacity to undertake fully-fledged drug research and to become actively involved in such a complicated, knowledge-intensive and capital-intensive industry as pharmaceutics. However, there are some considerations that mitigate this skepticism. For one thing, the established shape of the pharmaceutical industry and the corresponding pattern of innovation are by no means set in stone – if only because of the widely recognized productivity crisis of the current R&D model. It is also notable that middle-income countries like Brazil, India and China (the so-called BIC countries) have built up quite formidable industries for producing generic medicines (although their continued survival will crucially depend on

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[249] "Being able to use the senses, to imagine, think, reason – and to do these things in a 'truly human' way, a way informed and cultivated by an adequate education, including, but by no means limited to, literacy and basic mathematical and scientific training. Being able to use imagination and thought in connection with experiencing and producing works and events of one's own choice, religious, literary, musical, and so forth …" (Nussbaum 2006) 76.

[250] Willinsky (2006)

[251] Balkin (2006)

[252] Richard Jefferson quoted by Poynder (2006).

maintaining the "flexibilities" of the TRIPS agreement). It would be inappropriate to consider generics production simply as a "copycat" industry (the image that the non-generic pharmaceutical industry wants to convey). As Amy Kapczynski notes, "it was Indian [generic] firms that first incorporated all of the necessary anti-HIV drugs into one pill, thereby making it easier for patients to adhere to treatment and prevent viral resistance"[253]. The need to drive production costs down also requires skills to effect incremental process innovation.

The international pharmaceutical industry is definitely in flux. Companies are casting around to find new models for drug research and development. Under the leadership of its new CEO, Andrew Witty, GlaxoSmithKline is embracing a model of "open innovation" – which involves making a library of 13.500 compounds freely available for testing against malaria, granting access to patents and know-how of the company, and creating broad-based partnerships around a so-called "Open Lab" where researchers are allowed to access GSK's expertise and infrastructure – all in the name of breaking down barriers to innovation and access to medicines and vaccines[254]. Jeffrey Sturchio, former vice-president of Merck and currently president of the Global Health Council, also sketches a broad panorama of the changing landscape of innovation in the international pharmaceutical industry which in his view heralds a "new era for intellectual property"[255]. Sturchio notes that more and more companies, just like GSK, are adopting an "open innovation model built around licensing and alliances", and he also refers to the rise of partnerships between non-generic pharmaceutical companies and generic firms, an increased interest in innovation and IP among the latter, and finally to the rise of PDPs or product development partnerships (e.g. the Medicines for Malaria Venture, the Drugs for Neglected Diseases Initiative, the International AIDS Vaccine Initiative, and the Malaria Vaccine Initiative). The upshot of all these trends: "IP is still important, but it is being used now as a tool to foster more open innovation, rather than an end in itself"[256]. The reason Sturchio gives for the increasing popularity of the open innovation model among pharmaceutical firms is also revealing; it is "the realization that they cannot hope to generate or control within their four walls more than a small fraction of global biomedical research in areas of interest"[257]. It thus seems that the days of pharmaceutical laboratories as closed bulwarks of research and innovation are numbered.

During the last decade Product Development Partnerships (PDPs) and other forms of Public-Private Partnerships (PPPs) have been proliferating in the area of neglected diseases. Although this new wave of activity is of course highly welcome, its institutional setup is not without criticism. Hollis and Pogge have

[253] Kapczynski (2008) 872.
[254] Witty (2010)
[255] Sturchio (2010)
[256] Sturchio, idem., 5.
[257] Sturchio, idem., 4

pointed at some of the problems inherent in PDPs such as the difficulty to monitor contractual compliance among partners and the lack of sufficient incentives to push products through regulatory approval and promote their use by healthcare personnel[258]. Their claim is that these problems could be alleviated if a Health Impact Fund were in place. Shortcomings related to local participation have escaped their critical notice, however. Complaints have been raised about the lack of indigenous (in most cases here: African) representation on the boards of these partnership organizations, which is said to result in a perpetuation of "neo-colonial" dependency relationships, with monies being channeled through first-world head offices and decisions taken in the USA or Europe[259]. A related complaint is that the ethical acceptability of drug trials and other projects carried out in developing countries is often judged by the criteria set up by ethical committees in the USA or Europe rather than by local standards.[260] Another complaint is that a large part of funding for PDPs originates from a single source, the (admittedly very generous) Bill and Melinda Gates Foundation, which thereby gains enormous power to set priorities.[261] Rumors are circulating that decision-making on the malaria research agenda has been effectively "captured" by the Gates Foundation and that the WHO feels threatened by the latter's growing influence.[262] However that may be, it would seem that developing countries in Africa and elsewhere desperately need to build indigenous clinical, research and regulatory capacity in order to better set their own priorities, advance their own ethical standards and secure their own interests.[263] Otherwise they will continue to find themselves at the receiving end of decisions taken by companies and agencies headquartered in first-world countries.

[258] Hollis and Pogge (2010)
[259] Tucker and Makgoba (2008)
[260] Lexchin (2010). For a detailed case study, see Crane (2010).
[261] Lexchin, idem.
[262] See McNeil (2008).
[263] Cf. McNeil (2008).

6.

Global justice considerations for a proposed “Climate Impact Fund”

(with Henk van den Belt)

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Abstract

One of the most attractive, but nevertheless highly controversial proposals to alleviate the negative effects of today's patent regime is the Health Impact Fund (HIF). Although the HIF has been drafted to facilitate access to medicines and boost pharmaceutical research, we have theorized on the potential negative effects a similar proposal could have that is designed to promote the use and development of climate-friendly technologies. Drawing parallels from the access to medicines debate, we suspect that an analogous "Climate Impact Fund" will increase the already very high scientific and technological dominance of the developed world over the developing world and advocate alleviating this gap.

Keywords: technology transfer, distributive justice, health impact fund, development aid, climate change, priority, scientific participation

Introduction

Climate change is a mayor global hazard that differentially affects the regions of the world. While some areas will experience positive effects, such as increased yields in agriculture, the highly populated tropical regions will suffer negative consequences, such as a decrease in harvest yields and a wider prevalence of tropical diseases. Generally, a broad consensus holds that the current rate of greenhouse gases emissions cannot be sustained. Even if there is some scepticism whether catastrophic tipping points exist, the magnitude of potential hazards to life far outstrips the costs our and next generations would have to pay in order to mitigate greenhouse gases emissions. Therefore, we have strong moral reasons to give the benefit of doubt to the existence of such tipping points and advocate concrete proposals that could foster mitigation efforts.[264] In what follows, we would like to examine in how far the concept behind the "Health Impact Fund"[265] as formulated by Aidan Hollis and Thomas Pogge could be applied to the promotion of climate-friendly technologies. While earlier work[266] discussed some of the practical problems such a type of fund might encounter, we wish to concentrate here on global justice considerations that have to be taken into account.

After a short discussion of (1) the moral justification of the Health Impact Fund proposal, we will expose (2) that the fund might aggravate the inequality in the distribution of research locations, (3) the reasons why such inequalities are condemnable, (4) that the attempt to correct this injustice is more problematic than is apparent at first sight, (5) the special role grassroots innovators could play and (6) briefly elucidate the conflict that might arise in concentrating on mitigation efforts alone while leaving adaptation needs aside.

Incentivizing innovations

In accordance with Rawls' theory of justice, we could argue that an intellectual property (IP) regime can be legitimately established if under that regime the

[264] Cf. Singer (2004)
[265] Hollis and Pogge (2008)
[266] Timmermann and van den Belt (2012a)

least advantaged would be better off than without such an incentive mechanism. However, this type of reasoning does not resolve the question in how far the industrialized world is obliged to institute an incentive regime that not just barely matches this minimum constraint, but up to what degree it should aim at increasing the position of the worst-off to the maximum sustainable level. Addressing this one question has become a highly polarized never-ending debate with a strong clash of diverse schools of thoughts. The situation of not being able to find wide consensus for a clear answer has been aggravated by the fact that we cannot provide empirical evidence of how the well-being of the worst-off would change (or if it would change at all) if we had not the current incentive system for innovations in place.

In order to make today's intellectual property regime of patents more acceptable to the worst-off and to civil society in general, Thomas Pogge and Aidan Hollis have elaborated a detailed proposal to redress its negative consequences. The global extension of Western European, North American and Japanese standards of minimum recognition of intellectual property has increased the access and availability problems. Access to objects of innovation has become more limited, since the obligation of governments to recognize product patents (i.e. patents on the object itself, not merely the process by which it was produced) has limited the possibilities of generic manufacturers to develop cheaper alternatives to the original product for people with less financial resources. The availability problem is indirectly increased by this global extension of standards, as companies all around the world can recoup their research and development costs by selling the products resulting from their investigations on the world markets. When a particular market can pay much more for its desired objects, this creates an incentive to satisfy this particular demand, leaving other markets with less purchasing power unsatisfied.[267] On the other hand, when a market is very poor and has different needs, it will not be able to pay high enough mark-up prices to cover the costs incurred to develop the customized objects. When no third party jumps in, the research and development of the technological solutions needed may not occur and the products will never be available.

After the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement started to come into effect in 1994 universalizing the mentioned standards, generic companies that tried to fill in a market gap by developing innovations specified for resource-poor markets (such as single-dosage medicines) had to change business practices as selling retro-engineered drugs became illegal. Now more than ever, companies all over the world focus on providing products primarily designed to meet the richer markets' appetites.

[267] Here the high income inequalities come for the poor as a double penalty, they not only suffer from their limited purchasing power, but also from the rich being so much richer and thus attracting nearly all research efforts to satisfy their wants, cf. Pogge (2008b).

As other incentives systems to promote research and development that better suit the interests of the global poor – we may think of prize-systems[268] – are conceivable but have not been implemented, we can identify the current way innovations are incentivized as an institutional injustice. Arguments stating that countries voluntarily decided to sign the TRIPS agreement lose ground when we look at historical circumstances.[269] The implementation of the TRIPS agreement is more a story of a reckless imposition of a treaty than a textbook example of good global democratic decision-making practice. Making available the necessary resources for establishing the Health Impact Fund can be seen as a compensation for having violated the negative duty of not imposing an oppressive regime on others. The global trade regime, with its tariffs regulation and intellectual property rights standards, acts as an oppressive regime as far as competition possibilities for newcomers in the world economy go and the real prospects of using technology to address welfare issues are taken into account.

Distribution of research facilities

The Health Impact Fund addresses the two problems of access and availability previously introduced. The cost of medicinal treatment is often dictated by the sale price of medicines, thus reducing the price tag of medicines can make treatment more widely accessible. Pharmaceutical companies, holding exclusive rights, set prices and research agendas according to market incentives that are commonly driven by consumers' ability to pay. The idea of the impact fund is to offer an extra incentive based on the impact the medicinal innovation has on alleviating the disease burden measured in its capacity to increase quality-adjusted life years (QALY). A company that has a patent on a new medicine will have the option to either exploit its exclusive rights in the traditional way, i.e. by maximizing profits through sales or could commit to the proposed impact fund, selling its drugs at production cost and receiving a reward that would be dependent on the drugs' ability to add QALY anywhere in the world. If a company has a new drug that will primarily alleviate the disease burden of those who have less purchasing power it will rationally opt for the impact fund reward. The main concern of the Health Impact Fund is to make medicines available to the poor. We can fear however that by focusing on this noble goal, the implementation of the HIF may actually undermine other human rights, particularly the right to share in the advancement of science, as specified in article 27.1 of the Universal Declaration of Human Rights (1948, henceforth UDHR). The HIF uses the international patent regime for its goal of meliorating

[268] Prize-systems reward innovators that first reach pre-specified targets from public funds. For a characterization in the pharmaceutical area see Love and Hubbard (2007).
[269] Cf. Drahos and Braithwaite (2003), Pogge (2008b) and Singer (2004)

global health. Hence, it does not seek to abolish the use of patents for pharmaceutical innovations, as the proponents of the fund believe that the existent regime with a substantial addition (i.e. the HIF) leaves the worst-off better off than in a world prior to the TRIPS agreement.[270]

A widely shared critique to the HIF is that the fund does not actively tackle the distribution of IP rights themselves.[271] IP rights do not only give the possibility to exclude others from copying the product, but may also hinder research *with* the product. This facilitates monopolizing follow-up research preventing particularly poorer competitors from entering the market. The HIF would therefore leave the situation where research and development is almost exclusively done in the Global North unchanged, as it does not introduce additional incentives to remedy this inequality.[272]

Our concern is how far the HIF may use the patent system for its own purpose (i.e. improving global health) before becoming complicit of supporting the other inequalities brought up by the existing intellectual property regime.

The HIF seeks to make at least $6 billion additionally available to incentivize pharmaceutical innovation a year. The companies interested in claiming those monies have to develop a new medicine. Given the way the fund is designed, there will be a stronger incentive to develop medicines for diseases that burden a high number of people. This mechanism will favour research on diseases that are now affecting a huge number of individuals but for which no cure (or insufficient remedy) is available – particularly widespread neglected diseases. Research institutes that are located in the areas where such diseases are prevalent (nowadays mostly the tropical region of the world) may have an initial advantage by having better samples of the pathogen, knowledge on how the local population has dealt with the disease, ties to the affected population and scientific expertise on the subject.[273] However, we should not underestimate the huge power the expensive scientific infrastructure located in the developed world has in attracting the best researchers in the field, as well as its capacity to accelerate research. Even among research institutes in the developed world there is a firm competition in who manages to attract the best researchers with the most appealing start-up packages and cutting-edge facilities.[274] We can fear a further brain drain of the top scientists in the field of neglected diseases to the developed world.

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[270] Pogge (2009)

[271] This criticism can be found in DeCamp (2007), as well as in Timmermann and van den Belt (2013) [here reproduced as Chapter 5], but it is also a point raised by Knowledge Ecology International (keionline.org).

[272] Further, the HIF only requires from industry to give up their price-setting privilege and not to surrender patents. This is a concession made to industry in order to reduce the amount of money needed to create the fund.

[273] Timmermann (2012a)

[274] cf. Stephan (2012)

An additional problem is that the HIF in its present form does not provide any financial assistance to help resource-poor institutes to carry out clinical trials on their newly developed substances, therefore they will have to rely on partnerships with companies that do have the financial means to further develop the drug.[275] Here the terms of scientific participation within the partnership will end up being shaped by ideals of corporate social responsibility held by the stronger partner. At the end, the subjects of the right to share in the advancement of science will have to rely on corporate social responsibility to see if they will have a chance to participate in scientific endeavours on an equal standing relative to comparable merit. Reshaping an institutional order that clearly strengthens access to medicines, but leaves the fulfilment of the human right to participate in the advancement of science to the goodwill of companies whose behaviour is primarily moulded by market incentives, unavoidably entrenches a normative standpoint that advocates prioritarianism.[276]

Another issue is the status of clinical trials as a private good. The testing for biosafety and efficacy represent the biggest expense in drug development, consisting in a huge hurdle that impedes most companies to bring new medicines on the market on their own. Treating clinical trials as a public good, would allow also small and medium-sized companies to develop new medicines.[277] If the needed safety and efficacy testing is publicly funded, many conflicts of interest could also be avoided. When stakes are so high for demonstrating success, scientific accuracy is at risk. Outcomes are prone to be biased, standards might be weakened by a favourable selection of patients for testing the compound and publication of unfavourable results might be suppressed or delayed.[278] Generic companies cannot rely on the data submitted by pharmaceutical companies to regulatory agencies before a specified time (that varies according to drug type and jurisdiction) for the market approval of their drugs. In practice this can act as an extension of the exclusivity time, as most generic companies do not have the means to repeat the clinical trials in order to provide a new set of data to prove the already known performance of the compound in question. However, in theory, regulatory data shall only be protected from "unfair commercial use" (TRIPS, art. 39) – originally this phrase

[275] The need to rely on foreign partners could be aggravated if high fees to be able to register a drug with the Health Impact Fund apply.
[276] Here we understand prioritarianism as the position that seeks to raise the well-being level of the worst-off, regardless if that comes at the cost of a lower aggregated welfare level of the entire world population.
[277] cf. Reichman (2009b)
[278] cf. Reiss (2010). It is to note that the HIF provides an additional incentive for scientific accuracy as it pays out for measured health impact (in QALY) and not for claimed health impact. However making the public aware of long-term side-effects is still not directly encouraged.

was defined in terms of misrepresentation (i.e. confusing and misleading consumers), but US and EU authorities illegitimately invoke this article to justify a new type of proprietary rights over the data on efficacy and safety that companies have to submit to regulatory agencies.[279] Generic companies are therefore compelled to present a separate set of data in order to gain market approval. In order to avoid "unfair commercial use" of data, repetitions of tests involving the exposure of human and animal subjects to drugs with no therapeutic or scientific intentions are deemed acceptable. Some duplicative work could be avoided with a careful draft of the HIF proposal, as companies can be asked to give up data exclusivity rights after the ten-year reward period.

We have not been able to identify a clearer statement of what constitutes an "institutional order that is feasible"[280] and one that is not. Drawing the line between "real-world" possibilities and theoretical feasibility, does not only satisfy philosophical cravings, but builds a solid foundation for follow-up political legitimation. As the natural rights basis of intellectual property is hardly tenable and other forms of incentivizing innovations are conceivable, a world without pharmaceutical patents is theoretically feasible. Some pessimism might be implied when stating that such a world is in principle politically *in*feasible. However one has to be quite blind to current-day political power plays to believe that a radical reform in how innovations are incentivized will occur within a relatively short time frame. Here is where the HIF gains much support, it has much higher chances to be implemented in a shorter period of time, as it constitutes only an addition to the current intellectual property regime and does not seek to build a new incentive system from scratch. The implementation of the HIF does also not hinder people to continue advocating reforms that seek a fuller realization of human rights. If the HIF gains legitimacy as a temporary solution before a more fundamental reform can be carried out, it has to show that it will have a substantial effect on human lives before becoming out-dated – something that intuitively will be self-evident, but still may need a quantifiable estimate in order to contrast a scenario of inaction. For the arguments previously spelled out, we do not believe that the HIF is the best reform that can be conceptualized, however political realities make it a very good and feasible option that can be realised within a foreseeable period of time.

Advocates of the HIF who accept compromise for the sake of political feasibility ought to admit openly that we should give priority to having a higher number of healthy people over having a lower number of healthy people with eventually more people participating in scientific endeavours. This approach aims at minimizing suffering related to disease while categorizing unhappiness due to

[279] cf. Correa (2004) and Wadlow (2008)
[280] Pogge (2002)

lack of scientific engagement possibilities to a lower order of urgency. This compromise has to also acknowledge that the duplicative work necessitated by the current proprietary regime of clinical data is morally acceptable in order to reach the higher goal of improving global health. The fact that people who severely suffer from a disease cannot participate in science may help gather popular support for preferring one human right over the other, but if an institution formally acknowledges that it wishes to pursue one right at the cost of another, it will go against the progressive realization of human rights and thus violate international law[281]. The extra research money the HIF attempts to attract will most likely not reduce the number of people who enjoy the right to share in the advancement of science in resource-poor countries, but there is no guarantee that it will not enlarge the distributional gap of research facilities between the developed and the developing world.[282] History of innovation shows us plenty of cases where prolific patenting at early stages of research has been detrimental for further product development – many such "patent thickets" have been avoided by prudent researchers, fewer are the cases where governments have succeeded in taking action.[283] Making research in neglected diseases profitable will first of all create a race to the patent offices, restricting freedom to operate in the few areas where poorer research institutes could work with little fear of infringing patents.

There has to be a general awareness that spending less than 0,01% of the global income[284] for an Health Impact Fund cannot address all major inequalities raised by the implementation of the TRIPS agreement, but merely constitutes a much better situation for the global poor than not spending that money at all.
Thomas Pogge justifies his prioritarian position with an investigation on how nongovernmental aid organisations should allocate their limited resources.[285] However this justification presumes that actors cannot change the fact that the

[281] A comment on the International Covenant on Economic, Social and Cultural Rights (1966, henceforth ICESCR) article 2.1 notes that "any deliberately retrogressive measures in that regard [i.e. under the obligation of progressive realization] would require the most careful consideration and would need to be fully justified by reference to the totality of the rights provided for in the Covenant and in the context of the full use of the maximum available resources" (Office of the High Commissioner for Human Rights 1990, § 9). It is to note that a right to share in scientific advancement as spelled out in the UDHR, cannot be as clearly interpreted in the corresponding article 15 of the ICESCR.
[282] An outline of how research and development facilities of multinational corporations are distributed is offered in von Zedtwitz and Grassmann (2002). An insight on how this distribution affects the propagation of climate-friendly technologies is offered by Sarnoff (2011).
[283] Henry and Stiglitz (2010)
[284] calculated from Pogge (2009)
[285] Pogge (2011)

available resources are limited and thus are obliged to make sacrifices in order to reduce the maximum amount of suffering. Governments of larger economies or supranational bodies cannot use this same argument to justify a prioritarian position that neglects significant efforts for scientific capacity-building in developing countries in favour of improving global health as they are responsible for fixing the available resources for tackling injustices. Nongovernmental organisations (NGOs) have to justify "solely" what they have accomplished with the entrusted resources. Governments have to justify not only how they have allocated the resources collected, but also the amount they have found prudent to collect and the incentive systems framed. The slightest appeal to maximize welfare improvement per euro spent globally [286] will fail to justify any accountability based on proportionality. On that account, a net official development assistance that amounts to a 0,32% share of the gross national income of the 23 Development Assistance Committee countries[287] would hardly give a solid ground to morally justify this type of prioritarianism. A country like the Netherlands could finance the HIF with current official development assistance rate on its own, while Germany could pay twice the amount the HIF needs to start with its missing portion to meet the UN targeted 0,7% share for development assistance.[288]

What technological solutions should be developed?

There are a number of reasons why poorer people should not be excluded from being able to develop technological solutions.[289] Here we will discuss only one aspect: the lack of possibilities in influencing research agendas. Technologies are taking an ever more important role in our daily lives and participating in civil life without them is getting closer and closer to being impossible. On a global level there is hardly a democratic decision-making process to identify which technologies should be developed and what form they should take. Today most of the research is done in the developed world. For this part of the world we cannot say that the development of new technologies underlies strict democratic resolution, but there is nevertheless a strong civil society influence by the offering of governmental financial aid to specific business branches or the development of products by direct request. Technologies that cause public controversies can be banned altogether, but this liberty can only be made use of

[286] cf. Singer (2009)
[287] OECD (2011)
[288] data taken from OECD (2011)
[289] It has been argued that intellectual property affects the diversity in research practices (Timmermann 2012b) and work in progress concentrates in how far the current IP regime limits (or fails to secure) human flourishing and development (Timmermann 2013) [here reproduced as Chapter 3].

when a country can rely on alternative products or can expect to be able to develop such alternatives within a time frame that is compatible with the public urgency the availability of such alternatives demands. Here is where this particular liberty is especially at stake for countries in the Global South, as they almost exclusively have to make use of technologies already developed by the Global North without being able to question the local acceptability thereof.

Mitigating climate change with the aid of technology could be a much more inclusive effort than the battle against neglected diseases. When taking climate change mitigation as a global effort, researchers from poorer institutes could develop high impact solutions that do not necessarily rely on investigations made under an expensive infrastructure. The technologies developed would still count as an invention, being a public good – thus non-excludable and non-rivalrous in consumption – but will not necessarily have to continue with the trend of "complexity being better". Technologies that might be easily copied and thus nowadays do not have enough market incentives to be developed since exclusivity cannot be made full use of in practice, could be stimulated by the climate impact fund's reward system.

Here we can differentiate between a core invention, which will be applying for the fund's rewards, and subsequent local adaptation of the core invention. The company that brought up the core invention will benefit from the extra impact gained by the wide distribution of the invention and its local variation. When local variations have mutated to a new invention altogether, specific policies should be formulated to be able to draw the line between the new and the old product as well as to establish the fair shares each inventor should get.[290]

A second argument concerns the possibility of raising the bar independently as a group. If a society is dependent upon the technological innovations made by others, it will have to subject itself to a level of risk toleration that it cannot influence. Risk affinity varies among societies. Nowadays most countries do not have the infrastructure to develop alternatives or solutions. In the case that predefined standards of quality, levels of toxicity or climate change mitigation targets are deemed unacceptable locally, poorer countries have no possibilities to take action and will have to content themselves with alien criterions.

Finally, climate change mitigation is a global goal in which everybody should be able to participate as it counts as a worldwide hazard. Here access to the technologies becomes important on moral grounds. For example when insufficient public transport infrastructure is available, some people will have no option then to go to work with an energy-inefficient car. In other cases technical solutions to allow poorer people to play a role in climate change mitigation are

[290] The HIF mechanism makes the development of "me-too" drugs (i.e. drugs that have no substantial benefits over existing medicines to treat a particular disease) not lucrative. While this makes sense for diseases, the existence of me-too products to mitigate climate change has to be judged using different parameters and taking a wider scope of social implications into consideration.

not even available. People should have the freedom to contribute to a good cause, i.e. mitigating greenhouse gases emissions, and not to be in a situation where they can only cause further damage to the earth's atmosphere.

Correcting the injustice

Subsequent publications to the 2008 Health Impact Fund proposal have dropped the strict patent requirement. This was done mainly for two reasons, some high impact medicinal improvements are not patentable[291] and the potential of traditional medicine[292] can play an enormous role for global health and therefore has also to be harnessed. The current version of the proposal[293] suggests that researchers who gain the approval of a major regulatory agency, e.g. the U.S. Food and Drug Administration (FDA), should be eligible to receive the fund's rewards. Herewith we have a slightly wider opening of the 'filter' that decides which innovations can apply for HIF rewards and which not, as more innovations will qualify. The contour of this 'filter' does not only define the hurdle that actors will have to pass in order to receive the reward, but if shaped differently will also change the spectrum of actors attracted to the fund's rewards. Making the circle of potential applicants less exclusive will stimulate a higher competition among applicants to the fund. As the reward rate is self-adjusted by competition,[294] participating companies will have an economic interest not to have the rules of the game changed after the fund comes into existence. When we make it possible to reach the target (maximizing QALY) by more means we will increase the number of potential competitors and thus drive down the size of the reward.[295] Making the HIF rewards accessible for new competitors will primarily hurt the established large corporations mostly headquartered in the potential donor countries, something that small and medium-sized companies around the world will welcome, but which may provoke resistance from major business lobbies.
There is also another political catch, however, in dropping the strict patent requirement for HIF eligibility and settling for approval by a major regulatory agency alone. In the latter case, a company could be asked to give up some of the

[291] see Syed (2009)
[292] see Mendel and Hollis (2010)
[293] see changes in Hollis and Pogge (2009)
[294] see Hollis and Pogge (2008)
[295] The exceptional success of one candidate drug can also affect considerably the expected pay-out for other participating companies. The HIF considers having a pay-out ceiling for a single drug (Hollis and Pogge 2008). A minimum pay-out rate per QALY added could reduce uncertainties if clearly fixed. Designing the HIF with a self-adjusting pay-out rate comes with the price that every change in the scope of inventions that are allowed to apply for the fund's reward will encounter strong resistance with people having already products destined for the HIF in their research pipeline.

exclusive rights that derive from its proprietary control of the regulatory data in exchange for becoming eligible for the HIF rewards. The catch is that this might indirectly reinforce the international legitimacy of the principle of "data exclusivity" allegedly based on article 39 of the TRIPS Agreement, a principle that is currently being promoted by the US and the EU but that is fiercely resisted by India and other developing countries. The HIF could thus be seen as implicitly taking sides (and even the 'wrong' side) on this contentious issue.

Since especially in the case of climate-friendly technologies many non-patentable but high-impact innovations may emerge, the relaxation of the patent requirement deserves further elaboration.

It is in the public interest that a medicine has been approved by a regulatory agency for efficacy and safety. We can say that loosing up this requirement for any purpose whatsoever not only contradicts public interest, but may also jeopardize the health of people who are relying on the claimed benefits of the medicine in question. A Health Impact Fund that will not demand such safety tests will not do justice to its name. However this limits "impacting" global health to medicinal innovation and the making available of new drugs, leaving other ways to improve health unrewarded by the fund. There is a very good reason to concentrate on the development of medicines: the knowledge involved in their making is a public good. As a public good it is non-rivalrous in consumption – a welfare improvement that will survive wars and civil unrest. Medicinal treatments and cures can play a key role when natural or human disasters occur, as diseases that spread out by the collapse of infrastructure, overcrowded confinement of people and rape, can be controlled. As no society can completely insulate itself from such vulnerabilities, preventive measures for disease control can never do the full job.
As far as a Climate Impact Fund is concerned, regulatory approval plays a far lesser role.[296] It is easier to estimate the difference in emission output a new technology may have over an older one, than it is to measure the efficacy a drug has on combating a disease. The distribution of the innovation landscape has the potential of being much more dispersed than in the area of medicinal innovation, as a lesser minimum infrastructure is required. However there is a fundamental difference between climate-friendly technologies and medicines: the harm caused by manufacturing the products of innovation may supersede the claimed benefits. Estimating the total emissions caused by making the product available

[296] Regulatory approval might also be relevant for new agrochemicals and new agricultural crops which could potentially play a role in climate mitigation. Data exclusivity is not only claimed for medicines but also for agrochemicals, as the latter are also mentioned in article 39 of the TRIPS Agreement. Agri-biotech companies would also like to see regulatory data on the biosafety of GM crops being treated as proprietary.

on a massive scale is a quite challenging undertaking. The debate around biofuels has become a classic example. Therefore, some kind of hurdle to be able to apply for a Climate Impact Fund's reward seems also necessary. Some kind of certification body similar to the *Technischer Überwachungs-Verein* (TÜV) will be needed to set the standard of what kind of innovations could apply for the rewards. The selection of technologies will probably have to be limited to technologies whose total environmental production costs can be reasonably measured. The reward has to be fixed in relation to the total impact the technology has (reduction of emissions minus additional emissions caused by production and operation). To make the climate impact measurement cost-effective, we may not only have to restrict the types of technologies that can opt for the fund's rewards, but also demand a fairly specific standard in homogeneity of the objects of innovation.

Shifting the threshold line from having a patent with FDA approval to having FDA approval alone for eligibility for the Health Impact Fund may change fundamentally how the fund is perceived. The basic mechanism of the impact fund relies on an exchange. Innovators have to give up some type of exclusivity, mainly price-setting privileges facilitated by patents or by being the sole "owner" of clinical trials data, in order to be eligible to apply for the fund's rewards. Now, for the sake of the argument, let us imagine that a philanthropic organization systematically undertakes clinical trials to show the efficacy of traditional medicine. This organization applies for the fund's rewards for no other reason than to give the indigenous communities that brought up the traditional medicine the entire impact fund's reward monies. The decision is based solely on notions of desert – the indigenous community created a public good, a gift to society, something that has to be reciprocated.
In the case of medicines, this case might be nothing more than a thought experiment, due to the high costs of running clinical trials. While considering climate-friendly technologies, this possibility ceases to be utopian, as certification costs may only be minor. There might be some cases where the impact fund may have the possibility to reciprocate such kinds of gifts to society. Now having the possibility to do so and choosing not to, demands a justification. If the invention happened to enter directly into the public domain, should the impact fund reward the inventor solely on notions of desert? Does society want to use the scarce resources for addressing global hazards to reward something that is already in the public domain? A Maussean conception of gifts clearly demands some kind of reciprocity. Forgoing the possibility to reciprocating such gifts will send a very particular message on how society perceives them. Prioritizing the creation of new tools to combat current global hazards could count as a strong argument, but as we are conceptualizing a global solution we should not underestimate the social importance the reciprocation of gifts has for some societies in our world.

Harnessing the potential of grassroots innovators

It has been suggested that the possibility to adapt an invention to local needs and even to be able to build an equivalent using local resources is vital for distributing it to areas where the market does not have its expected effect.[297] When climate change mitigation is the central goal, there are limitations (at least economic limitations) to what we can reach with the help of standardized highly technological inventions. The huge inequalities in the world limit access to the objects of innovation and the diversity in educational backgrounds may hinder the effective use of standardized inventions in all corners of the world.

We may think of the newest generation of light bulbs showing great efficiency in energy saving. Those bulbs are expensive to acquire and require special environmentally safe disposal. In how far the next generation of light bulbs can take into account the purchasing power of the poorest half of the planet, as well as its recycling limitations, remains open, but there is some justified scepticism on how far development further down this road will be as cost-effective as a strategy that aims at a diversification of innovation projects. There are a number of inventions that can be amended according to local needs or can be locally reproduced.

By contrast, the knowledge involved in a method to convert agricultural waste into a soil enhancer, biochar, does not only add to climate change mitigation efforts but can also play an important role for food security.[298] If the method is taught to farmers in remote areas, many could develop variations thereof to adapt to the local environment and through a process of trial and error keep improving local variations. People developing particularly successful variations could be incentivized to teach other communities about their skills.

Conflicts of leaving adaptation needs aside

In an earlier sketch[299] of the practical problems of a Climate Impact Fund (CIF), we came to the conclusion that such a fund would only be feasible and cost-effective if it concentrates on incentivizing technologies that can be assessed by a broad across-the-board metric (in close analogy to how the original HIF uses the

[297] see Gupta (2010)

[298] An extensive presentation of the popular reception of biochar is offered in www.biochar-international.org. A brief historical introduction as well as a sketch of problems that have to be overcome for a wider use in East Africa is presented by N. Hagemann (2012).

[299] Timmermann and van den Belt (2012a)

QALY metric[300]). Therefore a CIF should concentrate, at least in its initial stage, on climate change mitigation only. At least for some technologies we can measure its relative improvement in reduction of greenhouse gases emissions to existing technologies, as mention earlier. Constructing a broad metric for climate change adaptation will be close to impossible due to the heterogeneity of the various coping strategies.

This whole path will lead inevitably to a series of disputes. Firstly, it is far from self-evident that choosing a metric for its simplicity will provide a sufficient justification for its implementation. Focusing on lowering the carbon footprint might undermine other very important goals such as maintaining biodiversity, recovering green areas, changing to more sustainable food consumption, etc. Secondly, a major initiative that concentrates solely on mitigation efforts, may lead to neglecting the importance of adaptation needs. Here we should not forget that benefits gained by climate change mitigation are a public good – nobody can be excluded from it. The urgency of climate change adaptation varies significantly, especially when assessing food security.[301] Local adaptation efforts may not automatically lead to solutions that could be exported to other areas that are also struggling to adapt to the new environmental conditions.

Conclusion

Prioritising a global relief of suffering caused by diseases or mitigating climate change are very noble goals. However the need of reshaping our incentive system for technological innovation in such a way that we can achieve those goals in a reasonable time frame should not prevent us from questioning the acceptability of the methods used in the process. We, as people participating in society, are still responsible for the institutional order that has been set up and that we maintain with our daily habits. As a collective we are deciding what is feasible and thus we cannot escape accountability.

We fear that by advocating an incentive mechanism based on the concept behind the Health Impact Fund we might implicitly confirm the moral acceptability of our global intellectual property regimes by failing to formally reject it. Even if this addition to the patent system is the best thing we could establish under given political realities and therefore solely support this type of innovation system to achieve our goals, we are still adding to the stability of a system that could be rejected on moral grounds altogether. Supporting the patent system in this way might make it harder for future policy makers to combat it. Generally, settling for the low minimum global justice commitment the HIF suggests, might not be without negative consequences for future policymaking.

[300] see Hollis and Pogge (2008)
[301] cf. Cline (2007)

Enabling people to participate in the advancement of science cannot be addressed solely by corporate social responsibility. We therefore suggest an "innovation inclusion clause" to be set in any proposed impact fund. There are multiple ways to incentivize inclusion, some more restricting, like limiting the availability of rewards to companies that have less than a defined percentage of scientific activities in the developing world (something that might bring other problems into existence that have to be addressed accordingly). Another way is to reserve a fixed portion of the available funds to help poorer companies to overcome the clinical trials hurdle (or the required approval of comparable regulatory agencies). Such a clause can still be framed in terms of negative duties: if the HIF adds to the research gap, it has to address this negative externality.

7.

Securing indigenous communities innovators' moral interests through open innovation models

Abstract

Indigenous communities are not only holding knowledge of their ancestors, but also actively engaging in inventive endeavours. As those communities dissolve a huge amount of knowledge gets lost, which does not only amount to a waste of global intellectual capital but can be counted as a violation of the moral interests of innovators. By adding a supplementary element to what is traditionally protected under the doctrine of moral rights of innovators, I will argue that a fair chance of having an impact should also constitute part of this doctrine. Through an emphasis in securing material interests, moral rights are often neglected, something that comes at a huge cost for the recognition of indigenous communities' inventiveness. I will claim that observing moral interests has in some cases priority over material interests and illustrate how open innovation models are an attractive alternative to secure innovators' moral considerations.

Keywords: traditional knowledge, recognition as peers, fair competition of ideas, intellectual property, global justice.

Introduction

Every year thousands of indigenous communities around the world are dissolved as their members get thrown out of their traditional lands or seek for new living opportunities in urban areas. This in itself raises a variety of justice concerns, of which I will elaborate only one: the fate of traditional knowledge.

Traditional knowledge has both a static dimension, as knowledge passed on through many generations, as well as a dynamic dimension, as the knowledge produced through autochthonous practices of observation, selection, adaptation, learning and a loose exchange of ideas.[302] Much of traditional knowledge is empirical knowledge built up over generations and grounded on practical evidence and can therefore be integrated in modern science.[303] Here I will understand traditional knowledge as a very wide concept, encompassing innovations and scientific observations made by tribal communities, small-farmers and grass-root innovators – basically all groups that do not have access to major modern scientific infrastructure.

Traditional knowledge is often not written down, making it vulnerable to be forgotten or misappropriated by outsiders, the latter being a phenomenon widely known as biopiracy[304]. In some cases traditional knowledge can be patented, although for that a relatively minor step is necessary: it has to be written down in a patent application using modern scientific language and when encompassing a genetic resource, this one has to be isolated from how it is found in nature. Both steps are mostly unattainable for indigenous communities on their own, creating a huge temptation to cut out innovators situated in remote and economically poor regions from their fair share. In order to counteract this inclination, a variety of access and benefit sharing mechanisms have been elaborated, although with limited success.[305]

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[302] For this distinction exemplified in a northern Thailand case study, see Robinson (2008).

[303] cf. ICSU Study Group on Science and Traditional Knowledge (2002)

[304] The political relevance of this term and the appropriateness of its use is analysed by Dutfield (2006).

[305] See Prathapan and Rajan (2011). An overview of the different philosophical traditions that support benefit-sharing schemes with an especial emphasis on the concept of desert, is given by De Jonge (2011). Van Overwalle (2005) and

In this paper I will defend a different strategy: open innovation. Under this model, knowledge has to be categorized and digitalized, therefore misappropriation[306] is reduced and loss is prevented, making innovations from an early stage of development accessible to a wide array of peers. As innovations are more visible, interested parties can comment and built upon the single contributions, as well as making innovators aware of flaws, repetitions or possible wastages of creative efforts by sharing past experiences with unsuccessful research trajectories. The model has the disadvantage that it might not enable innovators to secure their material interests. While defending open innovation, I will argue that (1) every innovator has a moral right to a fair assessment of her invention, (2) that this right is fundamental and in specific cases precedes economic interests, (3) that securing this right helps to achieve the deserved recognition of indigenous communities inventiveness, (4) open innovation models could help in securing this right and (5) those kinds of models will enhance recognition and therefore make practising science following autochthonous practices more attractive.

Moral interests of innovators

Traditionally understood, moral interests of authors lead to the recognition of two sets of rights: the right to attribution of authorship and the right to control the integrity of one's work. The right to attribution is the right to be identified as an author, to use a pseudonym or to stay in anonymity. Generally inventors keep the right to have their name written down in the patent document, even after the patent is sold or has expired. The right to integrity holds mainly in cases where the reputation of the author is at stake when the work is modified. In how far those rights are alienable and to what level they are protected, depends on the jurisdiction.[307] Some countries are quite paternalistic in their limitations to this freedom.[308]

Those two rights are the only ones identified in an official comment[309] to the human right in question, article 27.2 of the Universal Declaration of Human Rights (1948, henceforth UDHR), "[e]veryone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic

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Correa (2010) offer a detailed account on the legal constructs for protecting and preserving traditional knowledge.

[306] A requirement for patentability is that an invention is novel, i.e. that it was not made public before. The easiest way to prevent misappropriation is "defensive publishing", although the efficacy of this practice is under criticism, see Munzer and Raustiala (2009).

[307] cf. Conde Gutiérrez (2011)

[308] For a criticism concentrating on artistic work, see Beitz (2005).

[309] UN Committee on Economic, Social and Cultural Rights (2006)

production of which he is the author". I will follow the spirit of the Declaration and not distinguish between authors of a scientific production and inventors.

Departing from this legal tradition, I will make the strong claim that reducing moral interests of authors to those two concerns is rather narrow and deserves re-evaluation: a third element is missing, which is a right to a fair chance of having a societal impact with one's scientific contribution.

Developing tools is a fundamental human capability. We can even say that the specialization we have achieved in this field is the central characteristic of our species. While developing tools one is not only able to fully use one's senses and imagination, but one can also contribute to society's well-being.[310] Scientific enterprises can lead to the development of new tools which can save in the future work time and alleviate suffering, particularly that related to diseases or malnutrition. When the possibility to develop such tools is disproportionally open to only one part of the world's population, we can speak of an injustice – especially due to a lack of fair equality of opportunity – in cases where potential impact was not used to justify differential treatment.[311] This injustice is twofold: unjust to people whose welfare would have increased if the full innovative potential would have been permitted to unravel and unjust to people who consider participating in meaningful innovative enterprises as part of human flourishing.[312] Societal absorption of innovations is a prerequisite to sustain future innovative endeavours.

In order to show the relevance of this last point, I will built up on the concept of a "fair competition of ideas" developed by Rafael Ziegler.[313] Under this perspective an idea can be treated as an abstract entity with a particular set of rights, very in line with rights traditionally conceded to humans, particularly the right to freedom of movement, to equality of opportunity, and to not being discriminated against on the basis of origin. Treating ideas[314] in such way will highlight several global justice concerns raised by current practices.

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[310] Being able to use one's "senses, imagination and thought" has been explicitly identified by Martha Nussbaum as one of the central human capabilities, while being able to contribute to society's well-being requires some interpretation, I consider it as an element of being able to actively "show concern for other human beings" and nature (Nussbaum 1997). Generally having the capability to "care for", in the sense of looking after someone or something.

[311] Richard Jefferson takes a completely different starting point. Centralizing his argument on scientific progress, he has reiteratively casted out the indispensability of being able use, develop and improve tools, see Jefferson (2006).

[312] See generally Timmermann (2013) [here reproduced as Chapter 3]

[313] see Ziegler (2011)

[314] In this article I will encompass under the concept "idea" also inventions and ignore for the sake of the argument the differentiation made in the intellectual property discourse.

Freedom of movement. If we concede ideas a right analogous to the right to freedom of movement, any limitation to the propagation of ideas will have to be justified. Taking such a perspective comes immediately against intuitions on freedom of speech. Ideas are part of one's personality and thus we have no obligation to cast them out. Having this highly demanding duty would act as a huge disincentive to involve in critical thinking in the first place. Granting discretionary power to select the ideas one wishes to propagate will also reduce the amount of information one's peers have to evaluate. Thus, we have strong utilitarian arguments for rejecting too demanding duties to propagate ideas without constraints. However, those arguments do not apply to the same extent to inherited knowledge. An idea that has been passed on in a closed community falls normatively under a different category, since people are in such cases recipients of an idea already casted out. When judging if the idea is worth to continue to be communicated, the following generations have to make their decision based on different background knowledge than the person that originally communicated the idea to them.
Conceding an idea a certain freedom of movement, will impose on us a conservation duty as soon as we have some certainty that the idea will be lost if we fail to share it. Not recording an idea in a stable medium for it to be accessible and at the same time being unwilling to share the idea to someone who is willing to undertake that task, will be tantamount to hinder an idea's freedom of movement.

Equality of opportunity and non-discrimination. We generally grant people an equal right to participation, however when participation possibilities are limited, selecting on merit is in most cases widely accepted. When the concept of equality of opportunity is transferred to ideas we can understand this right as enabling an idea to take part in the systems of thought it has earned its position by merit. Meaning that the rank an idea has achieved in society, should be primarily traceable to its ability to improve people's well-being. Social utility should be the main factor to measure merit. An emphasis on the dexterity and ingeniousness of the idea itself may play a principal role in peer assessment, but should take only a secondary role when judging societal value. This type of reasoning will not allow discriminating ideas by origin and limiting their propagation in any way other than lack of merit. An idea originating in a small farm in Thailand should have the same right to compete for fame than an idea that came up in a Dutch university. This means that neither can it be forgotten nor forbidden its use through exclusive rights before having a chance to be widely evaluated. Furthermore, a society that favours one type of ideas over other types, has to also take into account the disincentive it creates for people to make use of their

freedom of speech[315] as biasedly selecting ideas may demotivate larger groups in making use thereof.
When competing for a societally relevant position time and environment play an important role. An exceptional achievement is qualified as such depending upon the circumstances it was brought up in. An idea can miss its potential of having an impact when it was brought up too early, history of science is full of such stories, or when it was brought up too late. Much of traditional knowledge may have the latter fate. Holding knowledge secret for a longer time comes at the risk of reducing its potential to influence. Similarly ideas have to be evaluated in a variety of environments. A centralized institution should not be the sole evaluator of ideas, as recipients in different kind of environmental susceptibility may find distinct uses. Making ideas widely available enhances the chances of being taken notice of by parties who could use those ideas to solve their local problems.

Ensuring that people have the opportunity to a reasonably fair assessment of the potential of their ideas is tantamount to securing the capability to show concern about one's environment by developing inventive solutions. However, besides securing individual interests, there are also collective interests that play a role. Ideas do not only serve individual interests, but also contribute significantly to a society's well-being. If a fair competition of ideas leads either to a faster rate of innovation or aligns innovation outputs to people's needs there is good reason to support it.[316]

Retaining and "destroying" ideas

When securing a freedom requires large-scale cooperation or a change in customs, delays are unavoidable. Postponing the public availability of an idea also affects its success in having societal impact. Since such delays are common practice, a clearer elaboration of the consequences is necessary. Retaining an idea for a prolonged time may have the consequence of its "destruction", which means that the constitution of an idea is deteriorated (one remembers only a fraction of it) or that it has become obsolete due to changes in the receptive environment. Deeply anchored in the Lockean natural law tradition of material property is the "non-wastage" proviso, but not all destruction can be assessed as

[315] The importance of having a wider concept of this freedom is advocated by Seana Shiffrin: "a comprehensive commitment to mental autonomy and freedom of thought and speech, in both personal relations and the public sphere, is a prerequisite for developing the full moral agency between equals, upon which a flourishing democratic and just society depends" (2011).
[316] An extensive defence for favouring an increased level of innovation is offered by Pogge (2008b).

wastage and therefore condemnable. Destruction leaves room for new creativity,[317] as both physical space and the amount of ideas we can be simultaneously aware of is limited. However I am not keen towards a direct translation of this last notion to the realm of ideas we can possess as a society. An argument that is refuted is "destroyed", but it is destroyed while having created a new fact (i.e. the argument has a flaw). This destruction does not amount to wastage, as the refuted idea was a necessary building block for a new fact. Speaking of a transformation is more accurate. Further, refuted ideas that were influential are often still available in scientific archives. This is the fate of many ideas, however ideas that are destroyed by being partially forgotten or having become obsolete, will never be subject to critical evaluation.

Granting ideas rights make it necessary to answer the question of when the suppression of such rights is justifiable. Here three problems are immediately identifiable: (i) sharing an idea is an act, whose proper fulfilment may take enough effort to shift it towards the category of supererogatory acts, (ii) some ideas are by nature damaging or beneficent – motives of sharing (or withholding) are not neutral for ethical evaluation, and (iii) if broadening the pool of knowledge is a societal goal, and the possibility to suppress ideas can act as an incentive to develop even more ideas, society might have good reasons to concede that possibility to people.

Sharing an idea that is already fixed in a stable medium with a second person can be an act that requires hardly any additional effort. This is not the case for much of what is known as tacit knowledge or generally for knowledge that has not been recorded. If people are obliged to share knowledge that was acquired by accident, we restrict their freedom to do other things during the time required to share the knowledge in question, something that is in need of justification. In cases where people agreed on taking over inherited knowledge, i.e. a situation where the knowledge was passed on under the condition of continuing to deliver it to the next generation, a duty to share might be easier to justify on basis of principles of reciprocity towards potentially interested future generations.

The simplest way to defend a duty to share knowledge acquired by chance, is to say that if we expect that our ideas should be awarded a fair opportunity to compete for impact, we should also do our part in giving other people's ideas the same opportunity. We can nevertheless expect that some people will be disproportionally burdened with the amount of knowledge they will have to save. Generally people who migrate, travel or have a diverse ethnic background, will most likely come into contact with much more undocumented knowledge. A fair distribution of burdens would oblige society to provide the technological infrastructure along with the necessary training of auxiliary personal to bridge the digital divide and enable people to share and access knowledge at a minimum cost for themselves.

[317] cf. Strahilevitz (2005)

There are cases where we might limit the propagation of an idea for good, since not all ideas serve public welfare – some ideas are even quite damaging. Is the concept of fair competition of ideas compatible with the notion of "constructive" and "destructive" ideas? The public good nature of knowledge leads to an immediate problem when ideas are to be judged through public deliberation. The evaluation of which ideas should be cast out becomes inevitably limited to a small group.[318]

In our society ideas are commonly retained or shared based on utilitarian calculations. Our patent regime works in a way that it gives holders of exclusive rights the option to restrict the potential impact an idea may have. Patents are justified on the basis that giving inventors temporary exclusive rights enables them to recoup their research and development costs and therefore makes the creation of even more new ideas feasible. Translating this to the former concept of fair competition of ideas means that society allows restriction in the competition for the sake of having more participants (i.e. ideas) involved in the "tournament". Here we have a standard utilitarian concession: limiting some rights for the sake of securing more freedoms in a near future.
This type of incentive system brings two problems. First, some people might be able to buy the exclusive rights over an invention and restrict its propagation, in order to not negatively suffer from the invention's potential. A bigger oil company has an incentive for buying the patent of a much more fuel-efficient engine in order to suppress its availability, since if widely present, it will lower the demand for fuel. Second, when a person has the possibility to sell an idea (e.g. especially if it encompasses an invention) and a seemingly low offer is the only reward she gets, the person might prefer to not share the idea at all to retain a certain pride.[319]
The first case is a clear example of abuse of rights[320], or more precisely a use of rights that is (up to a certain degree) legally tolerated but which goes against the original intention the law drafters had in mind. The patent system clearly foresees that patents should be granted in the interest of both producers and potential users of technologies.[321] In cases where the patent holder is not the

[318] Clearing this question will be out of the scope of this article, as this issue plays only a minor role for traditional knowledge.
[319] As soon as a person sells an idea, a certain measurable monetary value will be attached to the sold idea. This monetary value can be used for comparative purposes by the transaction parties as well as third parties familiar with this trade. Selling cheap might be unavoidably relate the offered object to other objects of similar monetary value but lower endowment.
[320] The concept of abuse of rights on resources in the philosophical tradition is exemplarily discussed by van Donselaar (2009).
[321] An example is offered by the Agreement on Trade-related Aspects of Intellectual Property Rights (1994) article 7: "The protection and enforcement of

actual inventor and does not have an uncompromised approval of such blocking use by the latter, we could even say that we have a violation of moral interest as advocated here.
While we cannot (and arguably should not) prevent people from prioritizing economic interests over moral rights they do not want to make use of, this freedom is not transposable to inherited knowledge where no clear record of the original will of the inventor is available. Here we have to give the benefit of doubt towards a willingness to share – similarly then the approach a few jurisdictions have chosen for organ donation: presume consent. When the person did not clearly expressed opposition during her lifetime, willingness to share is assumed, even when there is no consent from the family.

Indigenous innovators' inventiveness

Nowadays traditional knowledge is often treated as something that is free to appropriate or not necessary to conserve. Regularly the one extreme is justified by calling into attention the other pole. Some scientists in the Global North might excuse their actions by claiming that if they do not appropriate the knowledge, it will get lost, while some people who inherited indigenous knowledge from their ancestors prefer not to share their knowledge when not fairly remunerated. Both perspectives are defensible up to a certain extent. Indigenous knowledge gets lost when not properly recorded and a fair share of profits is seldom guaranteed to the providers of indigenous knowledge.
However both positions are controversial. The way scientist from the Global North document indigenous knowledge is often selective. What knowledge is chosen for being documented is not a matter of sheer fortune. Documentation efforts are aligned with key interests, such as food security or the development of new medicines, while following primarily market incentives. This preference leaves much knowledge out, as the overall global societal relevance of the idea is not the selection criterion. Common is the documentation of solely knowledge that meets the collectors' targets: knowledge that leads to products that can be sold in affluent markets. There is no incentive other than corporate social responsibility to document knowledge that has the potential to only help people in financially poor countries.
Regarding the fair sharing of benefits, it is very hard to guess what counts as an appropriate remuneration for a specific idea. One might have a bias to overestimate or undervalue the importance of one's own contribution. The lack

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intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations."

of transparency of pharmaceutical research and development costs only makes it more difficult to gain a better notion of a fair reward size.
Extending the notion of moral rights to include an interest in a fair competition of ideas will create a different emphasis in knowledge collection and evaluation. Ideas should have a fair opportunity to have an impact in improving society's well-being; it does not necessarily mean that making ideas widely available is tantamount to develop them in a marketable product. A considerable part of the world population cannot benefit from market mechanism in order to enjoy the benefits of innovative ideas. For many people an idea can only proof itself to be useful if it leads to a tool that can be made out of local resources.[322] Here is where the great and underused potential of indigenous innovation lays. Companies that rely on patents to recoup their research and development costs tend to produce products that are homogeneous and can be mass-manufactured. Exclusive rights give them also the opportunity to recover the expenses of an aggressive advertisement campaign. Developing products that can be easily reproduced with local resources with no major infrastructure is counterintuitive to this latter strategy. On the other side the situation of scarcity in which indigenous innovators usually have to develop their innovative solutions demands this very flexibility. Nowadays, most indigenous communities have little chance to learn what other communities in similar conditions are inventing. As science and inventive endeavours are social enterprises, a clear overview of what peers are doing is essential for constructive development.

Potential of open innovation in stimulating traditional knowledge

The establishment of intellectual property regimes has made defensive measures against misappropriation necessary. The question whether it is fair that indigenous communities and their governments have to fully pay for a defensive infrastructure is something I cannot discuss here.[323] However, the most likely outcome is that at least initially people who benefit the most from the intellectual property regimes will not financially support those infrastructures. Therefore it is important that indigenous communities can also harvest some benefits from this defensive mechanism.
Defensive mechanisms that meet this criterion are open innovation models. Under those models, the research and development process is made public in order to show one's creative efforts and make visible possible flaws or vulnerabilities in order to attract the services or advices of peers. In the case of indigenous innovators open innovation has to be necessarily embedded in a larger networked community that lives under specified rules in order to gather

[322] cf. Gupta (2010)
[323] I have discussed this problem of cooperative justice to a longer extent in Timmermann (2013) [here reproduced as Chapter 3].

sufficient attention. The use of licenses can (up to a certain degree) regulate in how far other researchers and product developers can use the knowledge exposed. There is a variety of ways to shape the rules of open innovation communities and the scholarship exploring such possibilities is in an early but rapidly expanding stage.[324] In addition to that, innovations can be even more rapidly shared with the use of digital social networks.[325] I will leave details on the exact format such communities should have aside and focus on a set of essential characteristics.

Ideally an open innovation platform that is set to promote indigenous innovation should (i) allow flexibility in spelling out authorship, (ii) be available in a diversity of local languages, (iii) be searchable by multiple criteria, (iv) allow users to easily add improvements, variations and feedback to inventions, and (v) offer the possibility to license out innovations in order to maximize the number of participants.

Firstly, we have to acknowledge that diverse communities might have different values on to what extent they want to recognize individual contributions or claim authorship. Especially when the invention is built up on knowledge passed on by ancestors, the willingness to be named as authors of an invention may vary. Some might prefer to name the community as a whole as the inventor while others would prefer to acknowledge strictly the individual inventor.[326] Allowing flexibility on this issue may avoid conflicts with customary law. In the case of static traditional knowledge, some inventions or discoveries might have been made independently in different parts of the world. Proving priority will be costly and of little utility for open innovation.

Secondly, if the aim is to promote indigenous innovation, the database has to be able to receive feedback and be readable in a variety of languages spoken in rural areas to overcome linguistic barriers.[327] Although here one should keep the goal of the database in mind: to promote indigenous knowledge. People that are able to express themselves in a more common language should give priority to the use of this language in order to reach a wider audience. Maximizing the potential audience should be a central target. Doing justice to the use a particular language should only be a secondary concern. An additional effort will have to be done to translate local botanic and zoological names into a common scientific terminology.

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[324] see Herzog (2011) and Eppinger (2012)

[325] see Atenas Rivera et al. (2012)

[326] Some recent evidence suggest that we are over-estimating the extension of communal property systems in indigenous communities. In many cases major self-interest does not surpass the person itself or at the most close relatives, cf. Hernando de Soto (2011). The way databases holding traditional knowledge can be shaped does not oblige us to reach a compromise, as homogeneity in this regard is not mandatory.

[327] cf. Gupta (2006)

Thirdly, if more criteria to search for inventions can be used, the dominance of "big names" can be reduced. The trend of relying on "big names" or generally on scientific citation indexes, established authors, institutions, geographic dominations or schools, comes at a very big cost for newcomers.[328] Action should be taken in order to minimize the chances that some groups end up over-privileged. One can design search engines in a way that top results are interlaced with randomly chosen entries. Here the increasing sophistication of online search engines should be harvested for addressing this disadvantage.
Fourthly, the possibility to add feedback to the database should also be available in rural areas. The key features that enable peer production, modularity, granularity and low-cost integration should be incorporated in the design of such databases.[329] Modularity means that the individual projects should be able to be broken down for permitting independent and unsynchronised contributions. If the size of those modules varies, it will be easier to attract reviewers with tasks that require different amounts of time and effort. Reducing the costs for innovators and database keepers to integrate and maintain new input is vital for good functioning. Here it has to be taken into consideration, that the major beneficiaries and contributors to the database will be indigenous innovators themselves. They are not only inventors, but principally also users of the technologies, thus profiting directly from any suggested improvement on their invention. The main motivation in contributing to the databases can arise from a sense of reciprocity after enjoying the benefits of other innovators' contribution.[330] Even if people take much more than they add to the database, large-scale network dynamics and the similarity of everyday problems people face, will still ensure a continuous expansion of contributions. Volunteers can take the tasks of reviewing the information inserted in the database, erasing obvious malicious contributions and trying to build links to industry and modern science. The possibility to link such an effort systematically with academic investigations might be worthwhile to explore.
Fifthly, excluding the possibility to have a financial gain for participating in open innovation may deter some innovators to contribute to the database. Possibilities to license out spin-off products or the invention itself should be available, provided the original inventor(s) receive a fair share on resulting benefits. Similarly, the option to suppress for-profit use should also be offered to contributors, again, to ensure compatibility with customary laws or to do justice

[328] In how far scientist should rely (or may rely) on past efforts and "big names" is a question that has been eagerly discussed for the last two centuries, perhaps most prominently by Robert Merton, for a brief historical overview see van den Belt (2010).
[329] cf. Benkler (2002)
[330] Benkler and Nissenbaum (2006) have identified a series of other social and individual virtues that explain why people contribute freely to such types of enterprises.

to specific moral values. When companies find innovations worthwhile to exploit, a rational interest to share some of the benefits with the original inventor will arise. As open innovation makes the original invention traceable a company that fears damage of brand image may feel compelled to share benefits to maintain a good reputation. The wider transparency will place countries that by international agreements have committed themselves to promote access and benefit sharing in more pressure to take necessary action.

To ensure that such type of platform succeeds in the long run, one has to ensure that informed consent is available when third parties add the description of inventions to the database.

The Honey Bee Network is an example of a database that serves the purpose of saving indigenous innovation from illicit third party appropriation while linking indigenous innovators to potential users of inventions and investors. In this Indian case, a central gathering of over one million ideas, inventions and practices is offered. The network does not only aim at documenting inventions, but also at disseminating them. One of the substantial efforts of the network consists in making the documented inventions available in the major local languages to ensure that people in the countryside can gather good knowledge of innovations made by people in similar conditions or environments.[331] The Honey Bee Network has already some experience with computerized networked kiosks (*Gyan Manthan Kendra*) to promote public awareness of traditional knowledge.[332]

Sacred knowledge

An issue that will be very difficult to handle is how ideas are treated in modern science. Conflicts with customary law regarding the use of traditional knowledge may seem unavoidable. Scientific ideas are subject to critical evaluation and are ideally denied any special status. Moreover overcoming any feelings of sympathy or sentimental attachment to an idea has been considered essential for scientific progress. Discarding one's life-time work when proven false is a sacrifice often made, we can even say it is even demanded by a scientific ethos. However, part of traditional knowledge is subject to customary laws, often considered sacred and its sharing subject to specific conditions.[333] The objectification of such knowledge may find strong resistance among indigenous communities. Some of the key characteristics Martha Nussbaum identifies for objectification can be

[331] More information can be found under www.honeybee.org.
[332] see Gupta (2006)
[333] cf. Taubman (2005)

translated to ideas: instrumentality, fungibility and violability.[334] In science ideas are treated as hypotheses that need to be tested and proven, in part or as whole, with little mercy on the author's original will. When incorporating an idea to a global system of innovation, it is difficult to give an idea a differential status. Research and development is dependent on being able to dismantle, exchange, use, criticize, refute and merge ideas partially or completely.

Over-estimating the character of "sacred knowledge" can go directly at the cost of stimulating indigenous innovation and the documentation of practices performed by vanishing cultures. An emphasis on fair competition of ideas would insist on regarding sacredness of knowledge more as the exception of the rule than the standard. Acknowledging the vital role knowledge can play to secure human rights demands to reconsider current practices of retaining knowledge and not to construct additional criteria under which the free movement of ideas can be suppressed. True, much of traditional knowledge is in the public domain because the design of intellectual property laws was mainly shaped to meet industry's needs,[335] however this argument does not qualify as a justification to permit further restrictions to the potentially positive impact an idea may have. As mentioned earlier, the temporary exclusivity on an invention granted by intellectual property rights is justified with the argument of enlarging the future pool of knowledge in the public domain. Securing human rights is a global task that requires the creative capacity of individuals and communities all over the world. Allowing a community to permanently retract some of their capacities from this commitment will go against principles of reciprocity in fulfilling human rights and opens room for further retractions.

Enhancing recognition

It is difficult to trace how much our industrial and academic research and development relies on indigenous innovation. A clearer transparency is urgently needed as we need to know in how far we are relying on those parallel forms of scientific practice. Even if our modern science could completely forgo indigenous innovation efforts, we should keep in mind that presently the overwhelming majority of the world can only participate in inventive enterprises when no major infrastructure is required. Maintaining and encouraging indigenous innovation is fundamental for an inclusive system of innovation and to allow people to help solve society's problems through technological and mechanical solutions.

Open innovation allows whoever identifies herself as a peer to speed up innovation processes.[336] An open innovation initiative that recognizes that

[334] see Nussbaum (1995)
[335] cf. Dutfield (2006)
[336] cf. Koepsell (2010)

indigenous innovators are in a favoured position to provide creative aid to people in similar environmental conditions and resource-scarcity situations can alleviate the negative effects of poverty significantly. Currently industry and academia, both heavily influenced by market incentives, shape the authorizing environment of what counts as "useful" innovation and what does not. As soon as indigenous innovation is openly accessible the evaluation of what innovations are suitable to serve urgent societal problems will be done by a much wider spectrum of people. If ideas have to be first marketed in order to be widely known, we should not wonder that unmarketable but high impact ideas do not reach rural areas and thus are never recognized for their potential. Fostering indigenous innovation will make it possible for economically poorer communities to offer technological advice to people in developed economies. Indigenous communities will then not be seen as mere technological aid receivers but recognized as active peers in the effort of maximizing worldwide welfare through innovative enterprises.[337]

Conclusion

The position I have exposed here departs from the trend of seeing traditional knowledge principally as a resource owned by governments. Such a perspective implies that treating knowledge as a commodity is widely accepted and supported by indigenous innovators themselves. I do not support a position that assumes that everyone has material interests regarding their intellectual labour and sees free-riding as condemnable, particularly in cases when the attempt to secure material interests through the use of exclusive rights may interfere with moral interests of inventors as advocated here.

Although applying the concept of rights we grant to humans to ideas is philosophically hard to digest and can only be used selectively for argumentation purposes, some interest insights nevertheless arise. When ensuring a fair competition of ideas, we not only enable people to be able to share in the advancement of science by increasing the possibilities of having a societal impact through indigenous innovation, but also broaden the opportunities to enjoy the benefits of the advancement of science by fostering the plurality of scientific practices.[338]

Choosing open innovation as a method to ensure widespread recognition of indigenous inventiveness has some problems in its own. The phenomenon that

[337] The concept of "recognition as peers" is taken from Fraser (1998); for the problem of recognition in development aid as a matter of epistemic justice, see Dübgen (2012).

[338] The human right basis is UDHR article 27.1: "Everyone has the right to freely participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits."

has been widely known as the "rush for green gold" has had as a consequence that much traditional knowledge is getting lost. This problem has two major sources: at the one side the opportunity to earn enormous financial benefits is mostly completely overestimated thus acting as an incentive to keep that knowledge secret in hopes for the arrival of a better "deal", often with knowledge ending up forgotten, and secondly, the acquisition and further patenting of traditional knowledge by developed world companies has been regarded by indigenous communities as theft (partially also caused by the inaccessibly high prices derived products have), which made those communities particularly hesitant to continue sharing their knowledge. Lack of trust is endemic and oriented to the industrial world in general. From this starting position, the project of open innovation has not only to encounter the hard challenge of setting up the necessary infrastructure and facilitating access to rural and poorer populations, but has the difficult burden of gaining the trust of its potential users. Although much more difficult in the life sciences, gaining trust in making people believe in the worthiness of participating in open innovation projects is possible, as the example of Wikipedia shows us. Large-scale participation is realistic, by democratizing the making of new rules, by transparency and by letting users be able to adapt interfaces. This last part is very important, since malleability fosters the notion of control and one shows greater trust towards what one has the power to change. Open innovation platforms can be shaped in such way as to ensure higher compatibility with customary laws. Here interfaces can be adapted in order to fit in a wide conception of what may constitute authorship and to offer the possibility to ban certain sales practices. However, one should not create a special room to legitimize practices that are not compatible with human rights, such as limiting the availability of knowledge to gender, specific age or ethnic groups, religion or other forms of illicit discrimination.[339] Some differential treatment however can be justified, like interlacing innovation reports on indigenous innovations in broad search engines results, in order to address past injustices.
Efforts to bridge the digital divide between indigenous communities and other users of open innovation platforms have to be made in order to ensure fair equality of opportunity. A third party effort that standardizes the terminology used by indigenous contributors and a platform design that permits small incremental contributions in multiple major languages should round up this major innovation integration aspiration.

Whatever approach one takes, illicit appropriation of knowledge can be a wrong to the original inventor, but the far greater injury is to be undeservedly forgotten. However, the notion of "fair competition of ideas" should not serve as

[339] Here my argument is leant upon Garzón Valdés (2004).

pretext to reduce (or limit future) self-determination rights of indigenous communities if not accompanied by comparable efforts made in the Global North.

8.

An assessment of prominent proposals to amend intellectual property regimes using a human rights framework

Abstract

A wide range of proposals to alleviate the negative effects of intellectual property regimes is currently under discussion. This article offers a critical evaluation of six of these proposals: the Health Impact Fund, the Access to Knowledge movement, prize systems, open innovation models, compulsory licenses and South-South collaborations. An assessment on how these proposals target the human rights affected by intellectual property will be provided. The conflicting human rights that will be individually discussed are the rights: to benefit from one's own scientific work, to benefit from the advancement of science, to participate in scientific enterprises and to self-determination.

A number of proposals and movements aiming at alleviating the negative effects of intellectual property regimes have gained popularity during the last decade and a half. The interdisciplinary character of the discussion has made compliance with human rights a standard assessment tool. The revisions to the existing regimes are, deliberately or not, far from addressing all issues that need to be dealt with, and mostly do not aim at offering an ideal solution. For the sake of political feasibility a number of concessions have been made in the proposals to gain governmental support, some of which have been severely criticized. The aim of this article is to provide an assessment on how the current intellectual property regimes along with six major proposals and movements that aim to improve such regimes relate to human rights commitments. The discussed proposals are the Health Impact Fund, prize systems, open innovation models, South-South partnerships, the Access to Knowledge movement, and the strategic use of compulsory licensing.

A brief introduction to the nature of human rights obligations will be provided, followed by an overview of the human rights affected by intellectual property rights. Thereafter the strengths and weaknesses of each proposal will be discussed. Finally, an evaluation will be offered on how the proposals relate to three different priority criteria: potential to secure basic needs, overall compatibility with human rights law and orientation towards the interests of future people. Throughout this analysis I will provide a comprehensive list of conflicting items with the aim of building a map where the different stakeholders' position can be identified.

Introduction

Intellectual property rights have a far-reaching impact that not only affects the lives of producers and buyers of developed inventions, but also society at large. Keeping a vital medicine as an artificially scarce resource using exclusive rights causes public outrage, especially when the strict market orientation of private companies results in the avoidable loss of lives.[340]

[340] Timmermann and Belt (2013) [here reproduced as Chapter 5]

There are a number of urgent global problems that need to be handled. Climate change is threatening future food provision.[341] Disease and malnutrition have an annual death toll of over 18 million people.[342] Increased social consciousness has crystallized in a number of organizations, institutions and individuals offering solutions. Science and technological innovation are among the institutions from which support is expected and solicited. In order for science and technology to deliver solutions that actively tackle those global problems the incentive system that drives research and development will have to be aligned to meet societal needs. [343] Shaping research agendas according to market demands as increasingly is done results in the poor often not getting the innovations they need (i.e. the availability problem). Profit-maximizing sales practices systematically leave people empty-handed (i.e. the accessibility problem).
It is often forgotten that the wide use of intellectual property rights dictates a specific type of scientific conduct that might be at odds with local customs, endangering diversity in science. Additionally, there is a general trend to favour break-through science at the cost of grassroots innovation. Lastly, those rights are very restrictive, limiting participation possibilities and decision-making opportunities.

Research and development in the life sciences has great potential to alleviate the disease burden and malnutrition problems of the global poor, but this potential is currently underused. This is something that we as a society have come to grips with due to the enormous existing welfare problems around the world. At the turn of the new century a wide range of promises to the global poor and ourselves were made to reduce those welfare deficits.[344] Progress however has been miserable and the first target deadlines are approaching, meaning that we have to prepare to justify our failings.[345] Despite the urgency of these issues, we still have the duty to ask ourselves what sacrifices are too high when trying to promote efficiency in research and development aiming at alleviating those pressing problems. Any reform attempt might be in jeopardy when the progressive realization[346] of other human rights is endangered. Perhaps one of the main lessons learned in the last century is that even for the noblest goals we should critically judge the means used for their promotion. Therefore, while

[341] Cline (2007)
[342] Pogge (2008b)
[343] cf. Drugs for Neglected Diseases Working Group (2001); Korthals and Timmermann (2012) [here reproduced as Chapter 4]
[344] Most prominently the Millennium Development Goals, in relation to food security cf. Genugten et al. (2011)
[345] Substantive criticism on the measurement of progress toward meeting the Millennium Development Goals is offered by Pogge (2010b) pp. 57-74
[346] cf. Universal Declaration of Human Rights (1948), preamble; International Covenant on Economic, Social and Cultural Rights (1966), art. 2.1

pursuing access to medicines it is still essential to be able to give a clear justification if in the process some rights are being neglected or even violated. A one-sided focus on basic necessities may undermine the triumph of having being able to agree as a global society on a comprehensive list of universally recognized human rights.[347]

The current intellectual property regimes and their alternatives

Intellectual property is a social construct that aims at stimulating innovation by ensuring temporary exclusive rights for those who can successfully claim authorship. Innovators gain by having the opportunity to recoup reasonable research and development costs. Society benefits from these intellectual endeavours by having a wider set of products in the market and once temporary exclusive rights elapse, also by having more knowledge entering the public domain for free further exploitation.

Especially after the Agreement on Trade-related Aspects of Intellectual Property Rights (1994, hereinafter TRIPS) started to become effective minimal protection levels became internationally standardized and binding. Thereafter many of those minimal protection guarantees have been raised through bilateral trade agreements,[348] which are automatically generalized through the "most favoured nation" rule[349], as any concession related to intellectual property made to one country has to be also granted to all other signatory member states.
Criticism of the new trade regime has been severe and various stakeholder groups are searching for alternatives.[350] The parties aiming for a change are far from being a homogeneous mass that shares the same interests and concerns. Disagreement already manifests itself in the choice of basic strategy. One group of advocates identifies a significant gap between what the TRIPS agreement actually requires countries to implement and the level of protection national legislation grants. Taking copyright as an example, while TRIPS requires a minimum protection of "no less than 50 years from the end of the calendar year of authorized publication"[351], common are protection terms of up to 70 years

[347] Strengths and weaknesses of having human rights justified on basis of agreements among members with different interests are discussed in Beitz (2009) pp. 73-95
[348] See Drahos and Braithwaite (2003), esp. pp. 85-107
[349] TRIPS, art. 4: "With regard to the protection of intellectual property, any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other Members …".
[350] Cf. Korthals and Timmermann (2012) [here reproduced as Chapter 4]
[351] TRIPS, art. 12

after the author's death. Adjusting national laws so that they just meet TRIPS minimal requirements would reduce significantly the negative effects of intellectual property. A second group aims at abrogating TRIPS altogether, or in a softer variant, to abolish patents in the field of medicine or those affecting food security. The third group takes the TRIPS agreement for granted, and this either by agreeing that with an addition that compensates some negative effects it will be much better than other alternative regimes, or simply, because they believe that such a kind of addition is the only improvement attainable. This last group aims at building proposals that stand in a positive relation to the TRIPS agreement by complementing it with necessary additions.

Much of the criticism toward the TRIPS agreement and intellectual property in general uses the human rights language. There is strong divergence on how human rights law is interpreted and on how invasive human rights are on the free exercise of intellectual property rights. We will dedicate the next two sections to discuss this interaction.

On the nature of human rights obligations

The UN Committee on Economic, Social and Cultural Rights defines three levels of obligations: to respect, protect and fulfil. The obligation to respect is seen as prohibiting states interfering directly or indirectly with the enjoyment of a particular human right, while the obligation to protect requires state action when third parties are interfering human rights guarantees. Under the obligation to fulfil states are required to pursue actions that facilitate, provide and promote human rights.[352]
Those principles should guide states to implement the different articles of the two Covenants in the spirit of the Universal Declaration. Here we should keep in mind the genealogy of intellectual property rights. Under human rights law the current intellectual property regimes should be seen just as means states have made to implement article 15.1 of the ICESCR.[353]

[352] UN Committee on Economic, Social and Cultural Rights (2000)
[353] An official UN comment distinguishes: "Human rights are fundamental as they are inherent to the human person as such, whereas intellectual property rights are first and foremost means by which States seek to provide incentives for inventiveness and creativity, encourage the dissemination of creative and innovative productions, as well as the development of cultural identities, and preserve the integrity of scientific, literary and artistic productions for the benefit of society as a whole." UN Committee on Economic, Social and Cultural Rights (2006) §1

As far as human rights obligations are concerned, the debates on how far states have obligations outside their borders will be left aside. Further, it will be taken for granted that we can agree on a very minimal welfare threshold line below nobody should stand as a matter of human rights. The extent of the debate around sufficientarianism makes it clear that an answer on where this line is drawn cannot be provided within this context. We should however note that no society can secure the objects of human rights absolutely, an attempt to do so would take up practically all of society's resources and still fail to fully guarantee all rights. Society can merely hope to sufficiently secure human rights.[354]

The emphasis will be put on a different discussion. For this article it is more interesting to identify the crucial differences between standard human rights violations and softer interferences in someone's enjoyment of a human right. Under the idea of soft interferences, borderline cases will be focussed on, such as routinely discouraging people to make use of freedoms guaranteed by human rights or giving another party an additional advantage that will completely demotivate people to make use of some of their freedoms. Such a type of intervention will however have to occur systematically to qualify as a human rights violation.[355] Single cases, interferences from one person to another, do generally not fit this category.

Discouraging scientists to research in areas where infringing patents is almost inevitable in order to not be vulnerable to costly lawsuits can be interpreted as limiting scientific freedom. Taking a very broad understanding of the right to take part in cultural life (encompassing scientific life) would be at odds with acknowledging that some areas of science are already seized. Participation possibilities would be restrained for people who are not able to persuade the holder of exclusive rights to grant a license.
More challenging to frame as human rights violations are systematic attempts to demotivate the economically poor to participate in science or being actively involved in decision-making that determines the role technology should have in their lives. The challenge does not merely consist in overinflating the concept of a human rights violation, but in the subjective nature of what may qualify as a demotivation. That what counts as demotivation for some, does not necessarily have the same effects on others.
There are some natural undeserved advantages that are clearly out of the scope of what is covered by human rights law. However, action has to be taken when the opportunity to make use of those advantages are not distributed randomly, but are concentrated in certain population segments.

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[354] Cf. Pogge (2000)
[355] Phrased in Pogge's words, human rights violations have to be "in some sense official" to count as such, see Pogge (2000) p. 47

Disadvantages are also a result of poverty, e.g. reduced intellectual capacities due to malnutrition during childhood. Since addressing those disadvantages entail the allocation of limited resources I will not discuss them further here. Important for the main argument is that some disadvantages can be traced to certain technological solutions being artificially scarce. As this is a direct effect of intellectual property policies design we will dedicate more attention to it in the next sections of this article. Here access to scientific literature is probably one of the most prominent cases, hindering the possibility to follow up-to-date discussions in cultural life (especially science) and politics.[356]

Catalogue of rights affected by the existing intellectual property regimes

Intellectual property affects human rights in multiple ways. To a similar extent, commonly held conceptions of justice clash with a reckless use of exclusive rights. Criticism of the post-TRIPS intellectual property regimes comes from a wide array of stakeholders and affected parties with diverse disciplinary and cultural backgrounds representing a broad spectrum of interests. Not surprisingly, the language used in the discussion and interpretation of intellectual property regimes and alternatives has a corresponding heterogeneity. Further, in discussions around the TRIPS agreement, it is difficult to identify who is judging the juridical virtues of the TRIPS agreement itself and who is unable (or unwilling) to critically assess the wording of the agreement without taking the realities of the world for which it was meant into consideration. Extreme inequalities in terms of power, wealth and legal expertise have an enormous effect on how an agreement will ultimately be implemented. That many liberties foreseen in the TRIPS agreement were signed away through bilateral trade agreements is a clear sign of these power plays.

Additionally, intellectual property regimes are only one of the many factors that affect the establishment of an international cooperative environment that promotes fruitful scientific enterprises. Labour law, migration control, freedom of speech, as well as gender, social or racial discrimination are all elements that affect a well-working scientific environment. International law generally takes this broader perspective when protecting science as a tool to promote social and economic development.[357]

Consequently, a very broad interpretation of rights will be taken in the following to help us understand real and apparent conflicts between the existing regimes,

[356] Online newspapers have greatly facilitated access to current day political discussions all around the world. Open access publishing of scientific literature is still relatively rare, likewise in the arts, particularly music.

[357] see International Covenant on Economic, Social and Cultural Rights (1966), art. 11.2 (a) and art. 15; Charter of Economic Rights and Duties of States (1974), art. 13 and generally Donders (2011)

the proposed alternatives, commonly held notions of justice and interpretations of human rights law. As mentioned, intellectual property regimes and the proposals for reform are not only criticized by a variety of private and public actors, but also by advocates of different – one could say often competing[358] – proposals, which makes it particularly important to have as broad an interpretation as possible to understand where real differences lay and which conflicts are merely due to misunderstandings.

(i) Benefiting from one's own intellectual work

Innovators moral and material interests have to be safeguarded according to UDHR article 27.2. Those private interests however have to be balanced with public interests and needs.[359] Intellectual property as currently conceived is not protected as a human right.[360] Human rights law demands from states merely to have a regulatory framework that will facilitate innovators the protection of their moral and material interests.[361] Here we have to realize the limitations of existing intellectual property law: patent rights allow only *some* innovators to protect the material interests of *some* of their inventions.[362] Geographical indications, which can be used to protect knowledge that is beyond the scope of patent protection have, as the name states, territorial limitations and are limited to collective innovation.[363] As far as moral interests are concerned, intellectual property law only recognizes two moral interests as such: attribution of authorship and being able to control the integrity of one's work. Other interests that are moral in nature, such as concerns about the licensing behaviour of one's employer over one's inventions are not legally protected.

For better or worse, much creative intellectual activity still remains beyond the scope of what can be protected by patent rights. Some scientific productions do not meet the non-obviousness requirement of patentability as they consist in a series of small-scale increments. Innovations that are not uniform and stable cannot apply for patents or plant varieties protection.[364] Rediscovery, even when assisted by scientific methods, is in principle not patentable.

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[358] There is harsh mutual criticism among the advocates of different proposal: for Knowledge Ecology International's review of the Health Impact Fund, see http://keionline.org/HIF

[359] TRIPS article 7

[360] UN Committee on Economic, Social and Cultural Rights (2006), especially §§ 1-3, 35

[361] see UDHR (1948), art. 27.2 and ICESCR (1966), art. 15.1(c)

[362] cf. Cullet (2007) p. 412

[363] cf. Sunder (2007)

[364] In agriculture, farmers' plant varieties, especially those coming from indigenous communities are unstable and in permanent evolution, which

Natural law recognizes a right to benefit from intellectual labour. However some intellectual labourers are able to gain from intellectual endeavours more than others, and this not due to the social utility of their effort nor by having undertaken more painstaking work, but merely by their type of work matching better the requirements set by the established innovation incentive system. Here we can talk about an undeserved advantage, which – given that the patent regime is a societal tool to stimulate innovation – puts an obligation on society to explain this differential treatment.

A defence to justify this differential treatment is however missing. At most, we can understand the human rights articles that aim at securing basic needs, such as food and health care, as dictating a certain preference for one type of innovation over other, less urgent ones. The relation between scientific knowledge and social utility is indeed addressed in human rights law. In relation to food production, ICESCR article 11.2(a) foresees that "States Parties … individually and through international co-operation … [shall take measures to] improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources". Official UN comments on the right to food and the right to health make similar provisions.[365] We are however, as mentioned earlier, far from of having innovation aligned with societal needs, especially when taking a wider cosmopolitan conception of justice.

Similarly, any theory that links ownership to notions of desert would have to explain why luck can play such an enormous role in determining the yield of harvestable benefits from an invention as is the case with intellectual property. The inventor who brings out the same invention independently a day later is not entitled to any benefits.[366] In general we can say that intellectual property law does not recognize effort in any special way.

The ICESCR recognizes in article 11.1 a right to the continuous improvement of people's living conditions. There is however no mention that this right ceases to be valid once one surpasses a certain threshold level. This right can be seen as a liberty that should be respected in itself, regardless of whether or not others are in a worse situation. The propensity to improve one's position, e.g. through

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disqualifies them from most types of intellectual property protection, see De Schutter (2011) p. 317

[365] see UN Committee on Economic, Social and Cultural Rights (1999) § 26 (on appropriate technology), § 36 (international cooperation) and UN Committee on Economic, Social and Cultural Rights (2000), §45 (on technical cooperation)

[366] for a critic see Nozick (1974) p. 182

science and technology development, can be seen as something intrinsic to human nature.

Yet, whatever claims one might have in being able to improve one's situation, a distinction between full and just remuneration still has to be drawn.[367] Taxpayers contribute to the establishment of a necessary research infrastructure. Various investments in public education and research facilities increase the chances people have in taking part in scientific enterprises. Further, inventions rely on previous knowledge, the production and conservation thereof having taken place all around the world. The fact that all have participated in the production and conservation of knowledge, to a greater or lesser extent, precludes that one country could justly claim being the full owner of a given piece of knowledge. Thus, under principles of fairness inventors, by having used previous knowledge, owe a certain social return to people all around the world.[368]

Finally, allowing others to benefit from one's work should not be seen as something deplorable. As James Wilson rightly notes in relation to innovators: "The fact that others can […] benefit from their work need not provide a disincentive for them, and if they are even moderately altruistic may provide an incentive."[369] The non-rivalrous nature of knowledge allows its simultaneous enjoyment by a number of people.

(ii) Benefiting from scientific advancement

The advancement of science brings about a series of innovations from which humankind may benefit. Science however follows research agendas and incentives that have been more or less deliberately set. The objects made newly available are partially determined by the direction science takes. We can however change this direction; some would even argue that we are obliged to do so in order to benefit people who are in direr needs.[370] Therefore, benefiting from scientific advancement can be understood as not only meaning access to the objects that science brings out, but also a fairer allocation of research efforts.

Moral (or in some cases legal) obligations to make objects of innovation available are determined by three main factors: uniqueness of the object, dependency upon it and on how urgently access is needed.

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[367] cf. Yu (2007) p. 1129

[368] Herbert Simon estimates that social capital produces at least 90% of the income in richer societies like the United States or northwestern Europe. On moral ground a social return may match this rate, see Simon (2001).

[369] Wilson (2010) p. 455

[370] Generally, utilitarians would mostly take such a standpoint, e.g. for this type of argumentation see Singer (1993) pp. 218-246

Uniqueness of objects. An object may be considered unique if there are natural or semantic constraints that impede the provision of an alternative. From a less strict perspective, an object may also be considered unique if reasonable efforts will not produce an alternative within the time the object of innovation is protected by exclusive rights. Lastly, a broader concept of "unique" will consider an object of innovation as unique if at present no alternative products exist.
In the first case availability of the object of innovation will depend mostly on the licensing behaviour of the holder of exclusive rights. Here responsible behaviour can be demanded, as the patentee is in control of the single existing solution. This responsibility diminishes the more alternatives are available or would become available if action was taken. The more alternatives are feasible, the more the responsibility is shared with civil society, which could also have engaged in similar endeavours to come up with solutions.

Dependency. An additional criterion is to analyse how dependent the fulfilment of a human right is on the availability of the object of innovation. Are there alternative ways to fulfil the human right in question other than using the object of innovation? Can we reach the same goal through other means? Mostly this is the case. Even in the instance of health we can question whether medicines are the sole conduit to better health. With preventive measures, especially through improvements of sanitary infrastructures, we can often avoid having to rely on medicines.
A common objection to this reasoning is to say that we are dependent on the object of innovation given the circumstances in which we find ourselves. The horrible state of deprivation in which a third of the world population lives makes us dependent on remedies and fixes.

Urgency. While temporary for society as a whole, exclusive rights are often permanently exclusive for single individuals. In the case of medicines, late access can mean death, injury or inefficacy. Less dramatic cases involve situations where an invention could considerably improve people's lives. We may think of innovation in water procurement methods that will make the carrying of water supplies over long distances redundant. This would increase the quality of life of women who are disproportionally burdened with this task. The need/want distinction is much more difficult to maintain than might appear at first sight, especially when there is no agreement on minimum welfare standards citizens are entitled to.

Besides asserting claims on the objects of innovation themselves, a fairer distribution in the targets of research efforts can be argued for. A possible interpretation of the right to benefit from the advancement of science amounts to an entitlement to a share of global research efforts. We are far from such a fair distribution. Prominent in the intellectual property and global justice debate is

the so-called 10/90 gap in pharmaceutical research[371] (other areas show similar inequalities)[372]. Herewith the deplorable situation where 90% of global health resources are spent to address the problems of 10% of the world's population is called to attention. Implicit in this criticism is that there is such thing as a fair share of research time to be distributed globally. This can be interpreted to entail that the amount of dedication to a particular problem should be proportional to its urgency – a particular welfare issue has to be measured in number of people affected and intensity of the suffering or disadvantage involved. Allocation of research efforts has to be distributed accordingly. Another possible interpretation is to say that everyone is entitled to having a vote on which targets research should be aimed at. Related to this is the general question on how much has to be spent on science and technology development altogether.
A general disagreement emerges when we ask ourselves in how far do people not only have a claim on what science provides but also in what science could plausibly provide for if research agendas and resources where directed to meet such targets.

An additional factor that has to be brought to attention is that the exclusivity granted by intellectual property rights not only serves to recoup research and development costs, but also advertisement expenses. This calls the general cost-effectiveness of intellectual property rights as a method to incentivize innovation into question. Money spent on marketing may pay better off than money spent on further innovation. It has been claimed that pharmaceutical companies are spending twice as much on marketing and administration as on research and development.[373] To these inefficiencies we have to add patent application, maintenance and litigation costs – all costs that reduce the budget of actual innovation.[374]
The use of research monies for non-scientific purposes can with good reason be condemned, especially keeping the urgent need for pro-poor innovation in mind, which demands a more efficient use of resources.

(iii) Participation

The most prominent readings of UDHR article 27 tend to ignore the participation in science component. However, especially the UNESCO has been eagerly

[371] cf. Drugs for Neglected Diseases Working Group (2001) and Timmermann and Belt (2013) [here reproduced as Chapter 5]
[372] Research in tropical agriculture has been similarly neglected, see De Schutter (2009) §34
[373] see Angell (2004) p. 1452
[374] cf. Stiglitz (2008)

promoting active participation possibilities.[375] Intellectual property rights affect scientific participation in multiple dimensions:

Openness. Intellectual property regimes may hinder openness in direct and indirect ways. Trade secret laws limit the freedom many scientists employed in industry have to discuss current findings, often even after employment ends. Patent requirements demand that knowledge on an invention has not been publicly disclosed prior to filing for exclusive rights, thus promoting a scientific culture that evades early disclosure of research results. Copyright laws allow also a publishing behaviour that is enormously restrictive in permitting access to literature and supporting datasets.
Lack of openness impedes the possibility to give feedback; this applies to input that serves self-interest as well as that which is altruistically motivated.

Relevance of state-of-the-art. The advantage break-through science has over achievements made by incremental improvements has been criticized.[376] Here we have to distinguish between deserved advantages and benefits gained by external circumstances. It might be acceptable that people suffer some disadvantages from being antiquated or because they refuse to use new techniques, but suffering the full range of handicaps for not being able to adjust to new trends seems too hard a penalty. As a further factor, one has to keep in mind that people who continue autochthonous practices conserve tacit knowledge and are vital to recover past know-how. Practising traditional medicine and partaking in seed exchange programs play an important role for the conservation of biodiversity. Society as a whole benefits from such undertakings.
Intellectual property gives researchers who are able to match the novelty requirement of patentability a considerable advantage by giving them the opportunity to recoup reasonable research and development costs. And, as mentioned before, intellectual property rights make it also possible to recoup costs of extensive marketing campaigns that further increase sales. Those who cannot match this requirement are facing multiple disadvantages.

Malleability. Increasingly holders of exclusive rights dictate the conditions under which the object of innovation can be used or modified. This has created so much outrage in the software community that it helped to nurture the open source movement, which aims at restoring past freedoms. The effects those constraints have on scientific participation are multiple. Setting specific terms under which people are allowed to contribute may limit both the number of opportunities to

[375] UNESCO (2009) and Timmermann (2013) [here reproduced as Chapter 3] with accompanying references
[376] see Thompson (2010) for agricultural innovation.

contribute and the number of potential contributors. Some innovators may also be deterred to contribute since the format their input has to be in does not suit their personal needs. Others may simply refuse to cooperate once the terms are unattractive or deemed unacceptable.
A restriction on modification possibilities limits the users' control of the object (so that they are not able to change and modify it as they see fit) – while such control is something that is intrinsically valued. There is a widespread interest to own an object (as a piece of property), not merely lease it. Article 17 of the Universal Declaration of Human Right identifies the right to own property as a fundamental human right.[377] Liberties that are traditionally associated with property rights include the ability to modify or even destroy[378] an item, a liberty progressively undermined by licensing developments in the music, movie and software industry. Exclusive rights on industrial seed varieties expand this trend by limiting traditional farming practices such as the replanting of seeds from past harvests, informal seed exchanges and further attempts to improve these varieties.

Diversity of input possibilities. Inaccessibility of information is one of the many barriers the poor face when they want to cooperate in existing scientific endeavours. The digital divide and language barriers are still strong obstacles. More than natural language, technical jargons amount to a significant barrier. Patent documents have to be drafted in a specific scientific-legal language that increasingly only a few legal experts master. Contributions to science also have to be made using a specific language.
Patent offices only accept patent documents that are drafted in specified natural and technical languages. Some advocates of freedom of speech would go so far as to consider this a method to limit the freedom to express oneself. Having such types of requirements are commonplace in the social and natural sciences. Certain standardizations facilitate the exchange of information between a wide array of stakeholders and individuals. What becomes harder to defend however is when particular groups of society are routinely hindered to partake in a dialogue because they lack the ability to communicate in the required language. This is the more unacceptable, when some of the remaining partners in the dialogue benefit from this lack of inclusion.

Reciprocity. Willingness to share and participate in certain endeavours is often affected by the perceived justness of a system. A successful cooperative enterprise demands that all partners are deemed worthy to cooperate with.

[377] A right to own property has also wide support in philosophical quarters; e.g. people are entitled to hold property (land and movable goods) under Martha Nussbaum's central human capabilities list, see Nussbaum (2011) p. 34
[378] cf. Strahilevitz (2005)

Perceived unfairness or misconduct in the past have to be addressed before it is possible to regain widely shared enthusiasm for cooperation.[379] Exclusive rights by nature leave many individuals without the benefits of science, something that is difficult to assimilate with certain intuitions of justice, as the wide global public support to access to essential medicines clearly exemplifies.[380] The non-rivalrous consumption of intellectual goods makes artificial scarcity objectionable.

(iv) Self-determination

Related to the issue of participation is the right to self-determination, a right that plays a central role in human rights law. The two Covenants (1966) concede a right to self-determination to peoples in their first articles. It is alleged that opening up participation possibilities for scientific enterprises will foster more democratic decisions for research agendas.[381] In principle, democratic decision-making for setting research agendas requires only a minimum scientific education and not necessarily active participation at the most advanced levels of research. Provided this is true, efforts to enable people to have a say in research agendas would not have to be linked to advocating more inclusive scientific research endeavours. Transparency in science and technology development would suffice.

Self-determination would however demand some type of decision-making mechanism that includes votes of people from all social and geographic segments. As mentioned earlier, research agendas are nowadays primarily shaped by market incentives – in a world with such huge inequalities a highly undemocratic system.

Further, some research that looks promising is often abandoned once research managers realize that exclusive rights cannot be obtained and this despite potential social benefits or utility.[382] Research institutes and private companies are continuously pushed toward delivering saleable patentable products; social utility and scientific freedom are rapidly relegated toward a secondary plane.

Research spending per capita differs strongly among countries.[383] Discrepancies in research spending are defensible if contribution rates are set according to capacity to pay (discounting maybe special needs). However when countries in a similar position differ so drastically in the budget they allocate for research and

[379] cf. Ooms (2010)
[380] cf. Kapczynski (2008)
[381] Shaheed (2012)
[382] Lea (2008) p. 46
[383] e.g. in relation to the GDP Israel is spending over twice as much as the United Kingdom on research and development in science and technology, see UNESCO (2012) p. 2

development, giving citizens from different countries the same weighting of their votes becomes hard to justify on principles of fairness.

Strengths and weaknesses of the different proposals

There is widespread agreement that current intellectual property regimes collide with ideas of justice and human rights on a wide range of issues. Unfortunately, beyond this shared conviction, there is little the different stakeholder groups are unanimous about. There is no conceptualized ideal solution that could serve as a yardstick from which to measure deviations. We can only hypothesize on how a world with a different incentive system would work.
However, among the different groups that have drafted the alternative proposals to be discussed below, an additional commonality can be found. There is a certain consensus that we live in a world of extreme inequalities dominated by very powerful players to which some concessions have to be made. None of the depicted proposals can be considered completely utopian and unaware of current realities. The extent however to which these limitations are taken as intransigent, varies strongly among the different proponents.

Proposals to alleviate the negative effects of exclusive rights do generally not aim at tackling all the problems raised by the IP regime and existing global inequalities. Instead, we have a wide spectrum of solutions, some with very modest targets, others being only satisfied with a complete changeover. The aims of the proposals differ according to what advocates recognize as problems and the level of urgency that they assign to them. Addressing political feasibility, advocates grant concessions to make the various proposals more attractive to governments and industry.
A further problem ensues from the circumstance that the discussion on what is feasible and what is not is highly polarized. This is due to the ambiguity of the concept of "feasibility" and its wide applicability. It allows to rule out certain proposals that cannot be implemented in practice, but also facilitates comparative assessment.[384] In how far we are willing to classify something as feasible or not, depends in part on what we consider an undeniable characteristic of political reality or essential to human nature. Since notions thereof are subjective, disagreements on what is feasible are inevitable.
The room for disagreement is further expanded, if we consider that many proposals are feasible only if one expands one's room for future capabilities by undertaking specific political strategies.[385] As this demands long-term discipline,

[384] cf. Gilabert and Lawford‐Smith (2012)
[385] Gilabert (2009); Lawford‐Smith (2012)

differences of opinion increase further. Long-term commitments do not only fail because of lack of discipline, but also due to disputes on how far we can bind future freedoms to present-day decisions. There are strong disagreements on the question if we are entitled to limit the freedom of those who are not present while we decide on future agendas.[386] Complexity is added in questions around climate change or pollution control, since lack of action today amounts to constrained room for action in the future. As a society we are accountable for both not having taken precautionary measures and bad planning.

To gain an oversight of the different solutions supported by various stakeholder groups, six major proposals with their strengths and weaknesses will be sketched. I will briefly note how these proposals relate to the four conflicting human rights discussed earlier: the right to benefit from one's own intellectual work, the right to benefit from science, the right to participate in the advancement of science, and the right to self-determination.

(i) Health Impact Fund

The idea behind the Health Impact Fund (HIF) is to gather a large sum of money to compensate developers of new medicines according to their capacity to increase quality-adjusted life years (QALYs).[387] Companies or institutions that develop new medicines and provide them at cost price may opt for the Fund's reward. Participating in the Fund is voluntary, although opting out is only possible after a certain time elapses. Patent holders are not required to give up their patents, thus retaining a certain control over follow-up innovation.[388]
The Health Impact Fund is designed to secure access to medicines. While later amendments make it possible to receive Fund's rewards by proving the efficacy and adequate use of traditional herbal medicines,[389] the Fund has been drafted with the main purpose of promoting health with Western-style pharmaceutical medicines. Based on the principles behind the Health Impact Fund, other types of funds have been suggested to propagate climate-friendly technologies[390]. A similar fund to foster pro-poor agricultural innovation is also conceivable.
The HIF asks from innovators to pass a certain hurdle (among other conditions) to be able to claim the Fund's rewards – in the case of medicines the market approval by a major biosafety regulation agency like the US Food and Drug Administration (FDA).[391] The cost-effective measurement of QALYs requires

[386] cf. Gosseries and Meyer (2009)
[387] Hollis and Pogge (2008) pp. 18-20
[388] Hollis and Pogge (2008) p. 22
[389] Mendel and Hollis (2010)
[390] Timmermann and van den Belt (2012a, 2012b) [the latter here reproduced as Chapter 6] and Pogge (2010a)
[391] Hollis and Pogge (2009)

standardization and minimum variations in efficacy between medicines of different manufacturers, making industrial mass production mandatory.[392]
The rewarding and financing mechanism of the HIF can only work if the system is transparent. However, exactly this has great potential in attracting the involvement of a wide array of research consortia, since transparency of capital inflow will increase trust among the different partners. We can also imagine that with an operative HIF companies will emerge that will focus solely on carrying out clinical trials for established consortia. Open innovation models that work with licenses that oblige their users to make modifications to the objects taken from the commons available to research partners could secure future funds by applying for the HIF rewards with their inventions.[393]
The Health Impact Fund aims at making the benefits of scientific advancement more broadly accessible. It also works towards a fairer allocation of research effort in order to make medicines for neglected diseases available. The profitability of intellectual work in pharmaceutical research is maintained.

Criticism. Countries where neglected diseases are most prevalent will have direct access to pathogens, local knowledge on how the disease is propagated, and contact with affected populations. Advantages gained by this forerunner position might be easily lost when we consider the vast superiority of laboratories belonging to established pharmaceutical companies or their research partners. No guarantees are given to increase the participation of researchers from poorer countries.[394] The proposal is like the current patent regime a winner-takes-all system, thus leaving any creative worker that was somewhat behind empty-handed.
Democratic decision-making on which research paths should be developed remains unaddressed. Thus little is done to improve people's right to self-determination.
The huge sum needed to set up the Health Impact Fund is seen as an impediment. Kathleen Liddell compares the 6 billion dollars annually needed to set up the Health Impact Fund with the total United Nations operating budget, which is approximately 30% less than what the fund needs and recalls the problems the United Nations faces to make countries pay their contributions.[395]

(ii) Prize systems - Advanced market commitments

In certain ways the Health Impact Fund can also be identified as a prize system, but there are other prize systems that have a completely different type of

[392] The negative effects of this measure are described in Timmermann and van den Belt (2012b) [here reproduced as Chapter 6]
[393] cf. Timmermann (2012a)
[394] Timmermann and van den Belt (2012b) [here reproduced as Chapter 6]
[395] Liddell (2010)

architecture. Some prize systems work with pre-identified targets, incentivizing companies to develop products with certain characteristics and functions. Advanced market commitments are one example of such type of prize systems and have already been put into practice for the development of some vaccines.[396] The idea behind advanced market commitments is that a central agency commits itself in advance to buy a certain number of end-products that meet predefined characteristics.

Another alternative is to stop providing patent protection for clearly specified research areas that are vital to secure human rights. The incentive to engage in research and development would be created by direct government funding. This strategy has been suggested for vital medicines.[397] A range of targets is identified and rewards set according to urgency and estimated development costs.

Generally prize systems aim to make the benefits of scientific advancement accessible and to orient science toward making solutions for wider societal problems available, while recognizing that innovators should be fairly remunerated. Prize systems have the potential to increase the self-determination of people. The characteristics and functions an invention should have can in principle be decided democratically.

Prize systems can be designed to reward second- or third-ranked options, alleviating the problem of a winner-takes-all system.

Criticism. Having predefined targets comes with the cost that there is little incentive in developing a product that surpasses the minimum characteristics specified. [398] The agency specifying the requirements that the object of innovation must meet has to have a fairly good knowledge of what it can reasonably expect, thus making good estimates only feasible when the potential product is already in a later stage of development. Potential products whose research has been vastly neglected would be bad candidates for such a system.[399] The modularity of the different prize systems makes it also easy for governments and funding agencies to cancel individual periodical prize contests without evoking the resistance of large stakeholders groups.

Prize systems do not actively encourage wider scientific participation, except when addressed to specific groups (e.g. young scholars' awards, municipal prizes).

[396] for a critical note see Birn and Lexchin (2011)
[397] see Love and Hubbard (2007)
[398] cf. Pogge (2012) p. 549
[399] Criticism based on the case of medicines is offered by Hollis and Pogge (2008) p. 106f.

(iii) Open innovation models

Open innovation does not consist in a single clearly defined proposal, a number of innovation models fall under this category. Here the concept will be used in an even broader manner by also including ideals prevalent in the open access and open source movement. As central to this trend we can identify the availability of at least one "kernel" that is openly accessible and works as a starting point for further innovation. The central aim is to facilitate outside contribution possibilities.[400] Following this basic principle, the "open— movement" can be ramified into different sub-movements.

One sub-movement is the open access initiative. A series of public institutions, think tanks and NGOs have committed themselves to increase the number of freely available publications.[401] Not only the outrage triggered by rising journal subscription prices, but also an increasing acknowledgement that information should be accessible to all without discrimination, has made this movement increasingly popular. Two inventions have boosted the potential of this movement. One is technical – the Internet and its immense potential to make huge amounts of information accessible and identifiable. The second invention is of a legal nature, and consists in a wide array of newly developed licenses, as illustrated, for example, by the Creative Commons models. Those licenses allow authors to retain only the legally entitled rights they want to make use of.
A diversity of opinions can be found regarding which rights one should be allowed to keep. Some groups allow all but commercial use, others don't reserve any rights at all. Similarly with the integrity of the creative work, opinions change in how far one may freely alter a created object. In how far one wants to have the created object attributed to one's authorship is also an issue where opinions diverge.
The movement has increased its outreach by making templates of different licenses publicly available.[402] Tutorials have made those licenses accessible for those who are not legally literate.[403]

The second sub-movement is the open source movement. Again, here a standard charter does not exist and we can identify great variations of this movement. We may say that this movement was sparked by people who are interested in inventing or in problem-solving more generally, and do not want to be limited by intellectual property restrictions. Distinctive is that many advocates of this

[400] on the benefits of openness in general, see Benkler (2002)
[401] cf. Budapest Open Access Initiative, February 2002, Bethesda Statement on Open Access Publishing, June 2003, and the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, October 2003, see Ress (2010)
[402] see http://creativecommons.org/
[403] ibid.

movement tend to refer to it as a restoration of past standards and not so much as a revolution.[404] Not only a balance between private and public interests is aimed at, but also a balance between interests of initial and follow-on innovators is sought for.[405] Open source models are especially keen in securing malleability of research outputs.
The architecture of open source projects permits the creation of new sub- or parallel workgroups. A project leader who does not fulfil the expectations of collaborators runs the risk of losing contributors to side-projects that do match common interests. Success of any project is dependent upon each project leader's capacity to attract collaborators.[406]
Somewhat different than in other movements, many open source collaborators identify themselves as part of a community. In how far users are expected to reciprocate by also sharing their contribution is something each open source platform decides on its own (either democratically or unilaterally). Some communities have developed policies that make the sharing of improvements to the community mandatory. This however generally counts only for improvements that have been made public. There are no duties to share improvements made for personal use only. Thus while aiming at certain standards of reciprocity, open source communities do not go as far as aspiring to fully share any improvement that came into existence.
In how far inputs are rewarded or not, depends on the research entities, thus limiting to a certain extent the possibilities to materially benefit from one's work.

In sum, the open innovation enthusiasm is chiefly about enabling participation. It is hoped that wider participation will also make the necessary innovation available, and a greater number of participants also increases the democratic legitimacy of innovation systems.

Criticism. Extreme inequality demands a system that delivers the products of innovation to the most needy. Open innovation could lead to technical solutions that are only apt for the technologically skilled. Open innovation advocates mainly freedom for research and development. The type of outcomes plays a secondary role; the emphasis is put on there being an outcome. Naturally, most innovators will tend to develop solutions for problems they encounter. However, those who have the liberty to innovate are most likely not the worst-off and also encounter a different set of problems. An active engagement with the problems of the poor will still have to be separately incentivized. Similarly, openness alone

[404] cf. Nicolosi and Ruivenkamp (2012), or in terms of repossession see Kloppenburg (2010)
[405] cf. Hope (2009) p. 171
[406] Hope (2009) p. 181

is not enough to allow the very poor to participate in science. Without access to basic infrastructure and education most people will not be able to participate.
The flexibility innovators have to move further to other projects comes at the price that additional incentives will be needed to maintain interest in finishing tedious long-term projects. This will require further resources, something that open innovation models in general have little capacity to sufficiently generate.
The issue of accessibility remains insufficiently addressed. Not having to pay for expensive licenses will certainly reduce the price of the objects of innovation, however extreme poverty also demands that those objects are cheaply reproducible, which however has to be incentivized through other means.

(iv) South-South partnerships

Establishing networks that connect innovative capacities amid different regions of the Global South is another initiative to alleviate the negative effects of the current intellectual property regime. People who live in similar environmental conditions share many of the same problems and often the same spare resources. Therefore, it seems natural that people who have been cognitively stimulated by comparable sets of problems have a great potential to learn from one another. Further, it has been noted that some people are so poor that they can only benefit from technological innovations if these can be reconstructed using spare local resources.[407]
One of the networks that aim at making grassroots innovators' knowledge more widely known and recognized is the Honeybee Network in India.[408] Much can be learned from a network that has shown great success in a country with such enormous cultural diversity within its borders and amounting to a sixth of the global population. The Honeybee Network is far from representing a negative attitude towards Western technology. It primarily encourages local innovators to participate in technological innovation to offer alternatives. But the same goes for the use of local technologies; it invites industry and farmers to become acquainted with local innovation. It does however recognize the vulnerability of grassroots innovators when it comes to protecting their knowledge. Here legal counselling is offered to help indigenous innovators secure their material and moral interests.[409] While making sure that innovators receive their share in any monetary benefits raised by their intellectual creation, the Network also focuses on securing the moral interest of innovators. Names, pictures and origin are information often shared if the inventor so wishes. And this also in cases where little or no material benefits can be expected. We can identify a particular ideal in this initiative: the recognition and promotion of local expertise. To honour this

[407] cf. Gupta (2010)
[408] Gupta (2006)
[409] Gupta (2006) p. 57

ideal a variety of outreach endeavours have been started, including computerized networked kiosks that allow inhabitants of rural areas to browse for innovations in multiple languages and an extensive radio and television coverage of local innovation.[410]
This type of initiative seeks to make available solutions for people who are in similar conditions as the inventors. The chances that such innovations become accessible to those in need are thus far greater. Since the inventor/user divide is small or non-existent, innovations are more focused on people's urgent needs. Inventions for everyday matters that do not attract much attention by the international scientific community, like improvements in sanitation systems, are more likely to be developed.
South-South partnerships aim at empowering people who are currently underrepresented in the scientific community to be able to participate in scientific enterprises. Wider participation increases the chances that voices of now excluded people are heard.

Criticism. On moral grounds, there is little one can criticize about this type of initiative. Coexistence in harmony is aimed at, something that is a laudable goal, but this demands from victims of past injustices to move on often without having their disputes settled.
Given the huge inequalities among rich and poor one might wonder if such networks will have sufficient power to rebalance losses suffered with the implementation of the TRIPS agreement. Especially innovations that demand a high level of expertise have still to find sufficient financial backers in the developing world. Except in the BRICS countries[411], big science projects will still have to rely on a significant help from developed countries or resort to an alliance of a large group of developing countries. Large differences within the countries make such type of collaborations unlikely in the near future.

(v) Access to Knowledge (A2K) movement

It will not come as a surprise that the central issue around the Access to Knowledge movement is to make knowledge accessible to people. The demand is to make knowledge more accessible for the fostering of scientific and cultural life. Currently, there are no obligations for copyright holders to make a publication available once it becomes out-of-print. The consequence is that the majority of works protected by copyright are insufficiently accessible. Archivists, educational institutions and libraries should have the liberty to make copies

[410] Gupta (2006) p. 60
[411] i.d. Brazil, Russia, India, China and South Africa

available when works are not commercially exploited.[412] The possibility to change protected content in order for it to be accessible for people with certain disabilities is also an issue the movement advocates.[413]

Patent documents may not include all necessary information to reproduce an invention.[414] Commitment to transfer know-how should be a prerequisite for the granting of a patent.[415] A general concern to make tacit knowledge available can also be identified in the draft treaty of the movement.

In the A2K agenda, we can find some elements that have to do less with access to knowledge directly, but more with justice in general. Patents can only be granted if the source or origin of biological material utilized is disclosed.[416] Here we can recognize an attempt to limit biopiracy – a policy in favour of securing indigenous communities' moral and material interests.[417] Similarly measures to make publicly funded research, data and broadcasting accessible are specified. When applying for patents, inventors must disclose if they benefited from governmental funding.[418] Access to governmental information is also justified as an issue of transparency.[419]

The movement also recognizes that the public domain is something that is in need of protection.[420] Ever more knowledge qualifies as protectable by exclusive rights and temporary exclusivity also becomes lengthier. Broadening exclusive rights can limit future innovation. Creative authors need materials on which to draw for further innovation. If the so-called "building blocks" of further innovation are privatized, access cannot be guaranteed. Recognizing that inventions do not come out of the void, efforts to actively expand knowledge commons have to be undertaken.[421]

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[412] Treaty on Access to Knowledge (draft 9 May 2005) (hereinafter A2K treaty (draft)) available at http://www.cptech.org/a2k/a2k_treaty_may9.pdf, art. 3.1 viii and for orphan works generally art. 3.8

[413] A2K treaty (draft), art. 3.3

[414] The TRIPS agreement art. 29.1 demands that the patent document should contain all information needed for somebody skilled in the art to reproduce the invention. This however is often not done precisely.

[415] A2K treaty (draft), art. 4.1 (c) iv.

[416] A2K treaty (draft), art. 4.1 (c) ii.

[417] For the legal status of traditional knowledge in international law, see Correa (2010) and Dutfield (2006)

[418] A2K treaty (draft), art. 4.1 (c) iii.

[419] A2K treaty (draft), art. 5.5

[420] for a general defence, see also Boyle (2008)

[421] A2K treaty (draft), art. 5.1. The importance of maintaining a commons from which everybody can draw for further innovation has also been ascertained for plant breeding by supporting easier access to genetic resources, see De Schutter (2011) pp. 325-327

Additionally, the A2K movement recognizes that intellectual property rights can be abused and demands clarity about which licensing practices qualify as such.[422] The idea of abuse of rights is also present in the TRIPS agreement.[423]
In relation to the above-discussed threatened human rights, the Access to Knowledge movement seeks to address all four rights. The benefits of science should be accessible to all and people are to be equipped with the tools to participate in the advancement of science. It tackles the issue of self-determination by seeking more transparency and empowering more people with a right to access to information. Some constraints are however set on how far people may exploit their creative work. A stricter balance between society's interests and the interests of innovators is sought. Additionally, it plans measures to avoid illicit exploitation of other peoples' inventions, especially by addressing the issue of biopiracy.

Criticism. The A2K movement is a very ambitious movement, often underestimating current political realities. The urgency to include more people in scientific enterprises is something difficult to sympathize with before subsistence needs are widely secured. Addressing the current level of deprivation half of the world population lives in is something most people would prioritize. Others may also question the need of engaging in more science and technology development before the benefits of existing inventions are widely shared.

(vi) Compulsory licenses

To label the wide use of compulsory licenses as a separate movement or proposal will most likely provoke objection. There are however good reasons to treat them here as one of the many proposals being discussed. Compulsory licenses recognize that intellectual property rights can be abused and that the way innovators may use these rights may run counter to public interests. The legal tool of a compulsory license entitles a government to override exclusive rights granted by a patent. States using compulsory licenses still agree that the patent holder is entitled to remuneration, but they reserve the right to establish what an adequate remuneration consists of.
Having predecessors in national jurisdictions, this tool was also established in the TRIPS agreement, and has been reaffirmed in the Doha Declaration on the TRIPS Agreement and Public Health, November 2001.[424]

[422] A2K treaty (draft), art. 7.1
[423] TRIPS, art. 40.2
[424] See TRIPS agreement, article 31

Using compulsory licenses can be decided democratically, but governments often have to fear retaliation measures by the patent holder's country of origin. The decision can be affirmed or rejected by international arbitration.

Criticism: Compulsory licenses have some short-term benefits, however when widely used or the threat of their use exists it discourages innovation in the affected field. The easiest escape from losing on research and development investment is to do research in areas where recouping one's capital is safe. Companies can simply avoid doing research in areas that will provide solutions specially targeted for the needy.[425] Thus, in the long run compulsory licenses do not solve the problem of access to the benefits of science and may even have a negative effect in aligning scientific agendas with the problems of the poor.
Enhancing participation possibilities is generally not addressed, at least for the very poor. An exception occurs when exclusive rights on broad patents are revoked, thus enabling again follow-on innovation by other companies as well.
Little is gained for the right to self-determination. Compulsory licenses allow only choosing from what is already invented.

A brief overall assessment of the alternatives

After examining the different proposals, the question is raised: which one of them should be favoured? This demands a clear assessment of the benefits and shortcomings of each one of them. Before this can be done, we have to recall that some of the disadvantages apparent in the proposals are actually deliberate concessions made toward political feasibility. The meaning of what concessions amount to is however also subject to a variety of interpretations. An example is Van Parijs' understanding of the term: "a concession does not consist of agreeing to receive less than one has an interest in obtaining, but rather in agreeing that one will receive less than what one regards as one's entitlement."[426] A proper use of the term would require from us to have a clear notion in regard to what we are entitled to. Unfortunately, there is a wide dispute on what our entitlements amount to (or to what we are obliged to provide others with), therefore making it inevitable that our understandings of what concessions are differ. Thus, three doctrines aiming at securing different sets of entitlements will be briefly discussed. Those are the basic rights idea, entitlements secured by the International Bill of Rights and notions defending rights of future generations.

Having basic rights secured is a widely shared goal, a common consensus one could say. However, here some differences in opinion arise at an early stage.

[425] Hollis and Pogge (2008), p. 99f
[426] Van Parijs (2012)

Henry Shue defines the right to subsistence as one of the basic rights. He means by this that without the minimum securities to ensure subsistence, other rights cannot be enjoyed.[427] The rights that are usually considered as basic are some of those we can find in the ICESCR articles 11.1 and 12 – the right to health, shelter and food. In how far science and technology play an indispensable role in securing those rights is far from self-evident.

In relation to health, the link between taking a medicine and a certain health outcome is often undeniable. While food is often seen as an even more urgent necessity than medicines, the causal relationship between a specific agricultural innovation and food security is more difficult to establish. The target of food security can be achieved by other means than relying on the particular innovation in question. Additionally we have special local circumstances that alter the hierarchy of the needs that are considered more urgent for human survival than others. People living around the polar circles would argue that one cannot be deprived of proper clothing and shelter for even less time than of food and medicines. It is commonly acknowledged that innovation can play a role to make clothing and shelter better suitable for harsh environments, but the securement of those needs is even less dependent on a particular technological innovation.

Thus, in how far a person tends to categorize an object as necessary for securing basic rights depends often on perceived vulnerabilities, and those vary according to multiple social and geographic factors.[428] Using the basic goods category to identify the objects of innovation that can be exploited without moral scruple would only make sense on a global scale if the objects falling within this category can be broadly bundled. The diversity of vulnerabilities obliges to offer correlative remedies and a prophylactics package. A strict hierarchy of which needs are more vital than others is impossible to defend on a global scale.

A number of technologies fall clearly out of the scope of what is protected by the basic rights doctrine, but can nevertheless significantly help to achieve certain rights protected by the International Bill of Rights. The importance of many of the less urgent human rights cannot be completely ignored by basic rights advocates. Since we do not have institutions that redistribute resources in order to guarantee that basic subsistence rights are more widely secured, people are compelled to do everything in their power to overcome local threats to health, food security and generally hazards coming from an exposure to a harsh environment. Having access to research networks and a basic infrastructure to undertake experiments enables people to seek for solutions on their own. Failing to continuously assist people as they fall into distress makes it mandatory to

[427] Shue (1996)

[428] For perceived vulnerabilities, in terms of identifying oneself in a position of disadvantage, see Wolff and De-Shalit (2007)

enable them to be able to provide for themselves. Securing possibilities to partake in science and technology development releases people from a relationship of dependency, a goal that is laudable in its own right.[429]
Copyright limits access to the most recent scholarship and research in the social and natural sciences, having the effect that many people are not informed about the newest development in fields that concern their daily lives. Being misinformed or having scarce access to information makes citizens vulnerable. Democratic citizenship demands access to information and the tools that make knowledge more widely accessible and permit a more open dialogue. This is vital for self-determination.

Lastly, technologies shape not only our current society but also the way future people will live their lives. Most likely the next generations will build up on technologies we have developed, as we have continued to develop technologies our ancestors made available. Science technologies are not neutral in the ethical assessment and we are accountable for the direction research agendas have taken. Failing to develop an innovation incentive system that allows us to democratically steer research agendas is a major omission, which makes the current generation responsible for the direction it allowed science to lead.

The situation of extreme scarcity in which half of the world population lives, makes it difficult to abandon a prioritarian position. The suffering caused by malnutrition and disease is so devastating, that access to medicines and work toward food security simply have to be prioritized. It makes therefore sense to follow the drafters of the Health Impact Fund and offer an incentive system that addresses at least one of those major problems. However sticking to addressing subsistence needs only will never erase the stigma of strict dependency from the global poor. Stimulating South-South collaborations is a great path to a world where people assists each other mutually through innovation.

As a final remark, emphasising the role technology could play should not make us neglect wider social problems. While knowledge and the accessibility of new innovation may help us achieve a variety of social goals, extreme inequality undermines much of the potential benefits we can harvest from innovation. As a world of extreme equalities undermines incentives to excel, a world of extreme inequalities undermines the achievements of those who have excelled.

[429] cf. Timmermann (2013) [here reproduced as Chapter 3]

9.

Concluding remarks

In this thesis we have examined the complex interaction between intellectual property rights, life sciences and global justice. Science and the innovations developed in its wake, as we saw, have an enormous effect on our daily lives, providing countless opportunities but also raising numerous problems of justice.

The complexity of a problem however does not liberate society as a whole from moral responsibilities. Our intellectual property regimes clash at various points with human rights law and commonly held notions of justice, as chapters 2, 3 and 8 revealed. After having exposed the most common ethical theories used to justify pro-poor innovation in the second chapter, I have developed the moral framework used throughout the thesis in the next chapter. The main supporting arguments for my position come from the capabilities approach, the human rights discourse and recognition theories. Facilitating participation possibilities in science is essential to ensure full human functioning and reduce relationships of extreme dependency. More inclusive innovation systems give also science and technology development a more democratic character.

To gain an insight in the amplitude of the questions at issue, I have added a conference report presenting the current state of the debate, which constitutes chapter 4. Here key societal problems were discussed in relation to food security and global health. The importance of safeguarding the survival of small and medium-sized enterprises, of fulfilling development goals commitments, halting genetic erosion and establishing a global knowledge economy were among the debated subjects.

The huge problems raised by the intellectual property regimes and the growing awareness of the missed opportunities to provide technological solutions for the needy have called the attention of a number of institutions and individuals. As we saw, a variety of proposals and movements have emerged to counter the problems of the current regimes, chapters 5, 6 and 7 analysed three of them: the Access to Knowledge movement, the Health Impact Fund and open innovation models. Benefits and shortcomings were discussed with regard to three problem fields: access to medicines, climate-friendly technologies and traditional knowledge.

The last major chapter wrapped up the previous three chapters by offering an assessment of six prominent proposals using a human rights framework. Having pinpointed which human rights are affected by intellectual property, we saw the positive and negative elements of each amendment proposal.

We can now examine if we have found satisfactory answers for the research questions stated in the introduction. Let us recall those questions:

1. *What are the main ethical theories that justify fairer access to innovation?*
2. *Should one consider scientific participation possibilities as a luxury to be left aside until subsistence rights for the great majority of people are secured?*
3. *Should extreme inequalities in research capacities between the Global South and the Global North be fought even when the objects of innovation are made accessible worldwide?*
4. *What are the benefits to be expected from research and innovation and how do we judge that the international system of science and technology is working properly?*
5. *How can we secure the moral and material interests of indigenous innovators using the current intellectual property regimes?*
6. *Is there, among the various proposals that have been brought forward to enhance the global justice of the international intellectual property and research system, any amendment proposal that should be clearly favoured?*

In addition to those research questions, four major problems raised by the intellectual property regimes were also identified in the introduction:

(a) Intellectual property rights impede *access* to objects that are essential for human welfare, such as medicines.
(b) Market incentives for innovation shift research attention to satisfy the desires of the rich, while solutions needed to alleviate the problems of the poor remain *unavailable* or are insufficient.
(c) Intellectual property rights are highly *unevenly distributed* between the Global South and the Global North.
(d) Intellectual property affects negatively *good scientific practice* and distorts a fair appraisal of research efforts.

Taking those four problems into the evaluation, we will examine one research question at the time starting with the first one. When asking "*what are the main ethical theories that justify fairer access to innovation?*" I set forward the need to briefly expose the main moral arguments prevalent in the global justice and intellectual property rights debate. This was done in the second chapter. Here arguments to make innovation for the poor accessible were given. I also argued for the necessity to allocate research efforts to make solutions for the problems of the poor available. The chapter concluded by emphasising the importance of taking the high levels of inequalities into consideration before making any ethical assessment.

The second question focuses on the issue of establishing priorities: *Should one consider scientific participation possibilities as a luxury to be left aside until subsistence rights for the great majority of people are secured?* Achieving food security and improving global health are noble aims; many freedoms can only be enjoyed if subsistence is secured. However we have encountered sufficient evidence that proves that we do not live in a world of such extreme scarcity where we have to abide by a very minimum level of human flourishing possibilities. Global poverty and hunger can be eradicated with existing resources. Further, chapter 3 discussed in detail why participating in science is a goal people may want to pursue for its own sake. Participating in science helps some people find meaning in their lives by including their input in solving problems that affect society and develop their capabilities. Besides contributing to the fulfilment of the human right to participate in cultural life (including scientific life), making scientific enterprises more inclusive allows securing other human rights. Having more people from diverse cultural backgrounds participating in science increases the chances that the developed technologies are also socially acceptable – addressing the issue of availability (problem *b*). In the same manner, wider participation gives science agendas a more democratic character, something that is in line with the human right to self-determination. Assigning a higher value to scientific participation makes it more difficult to relinquish inclusion. Wider participation also ensures a fairer assessment of research efforts (problem *d*). Herewith we have provided a number of arguments that speak against blindly prioritizing subsistence rights over increasing scientific participation possibilities.

The third question targets bringing up what is wrong with extreme inequalities in research capacities: *Should extreme inequalities in research capacities between the Global South and the Global North be fought even when the objects of innovation are made accessible worldwide?* Especially in chapter 6 it is argued that such inequalities should be fought. Societies that do not have a sufficient scientific infrastructure will be dependent on solutions developed in other parts of the world and will often have to rely on innovations that are less suitable for their own needs or inadequate for their cultural background (see also chapter 3). Such a divide has also a negative impact on the economy of the poorest countries. By having to acquire technologies from the developed world, a constant outflow of money occurs in only one direction. The revenues from natural resources exploitation are often not sufficient to recover the money that leaves the country. Agriculture, one area where many countries are able to compete with the developed world, is increasingly dependent upon farming inputs covered by intellectual property law, such as seed varieties, pesticides, fertilizers and herbicides. Financial gains from exports are thus proportionally reduced by the costs of importing agricultural inputs.

Chapters 5 and 6 give some examples of the variations in needs faced by people living in different environments. Especially when the needs of people who produce innovations do not match those who are dependent upon these innovations shortfalls occur. The concept of neglected diseases epitomizes this circumstance. This is a significant challenge when research capacities are concentrated in only a small part of the world. Since the developed world strongly relies on intellectual property to incentivize innovation, this mechanism will strongly influence what is considered as scientific (problem *d*) and thus leave much of the creative effort made by indigenous communities unrecognized.

Let us move on with research question four: *What are the benefits to be expected from research and innovation and how do we judge that the international system of science and technology is working properly?* In a world dominated by economic modes of thinking, production systems are primarily measured in terms of efficiency. Science and technology development are no exemption. Efficiency in research output can be interpreted in different ways. Nowadays scientific output is often measured in terms of number of patents granted or peer-reviewed articles published – such type of measurement focuses clearly on break-through science and this at the cost of small-scale incremental research. However, efficiency can also mean the capacity to transform research resources into socially beneficial products. And even here we encounter important differences; products that perform similarly well in fulfilling a certain task (e.g. improving harvest yields) can have completely different complementary benefits. In the case of climate change mitigation, some innovations primarily benefit the developed world industry, other inventions have the capacity to bring considerable additional benefits for the Global South (as we saw in chapter 6 with the case of biochar). A more inclusive innovation system will also add to more diversity in research outputs. An international incentive system for science and technology development is working properly when innovation addresses its specified targets while bringing the greatest amount of positive externalities.

A question of a distinct nature is research question number five: *How can we secure the moral and material interests of indigenous innovators using the current intellectual property regimes?* This issue is particularly important for maintaining diversity in knowledge production systems. In chapter 7 we discussed an option that is compatible with the current intellectual property regimes: open innovation models. While these models are not the best method to secure the material needs of innovators, they have great potential to make sure that at least the moral interests of these innovators remain protected. In order to state the importance of securing the latter rights, I introduced the concept of fair competition of ideas, building on work done by Rafael Ziegler. Here I stipulate that once a person assumes the effort to pass her knowledge to others a minimum concern to the fate of this knowledge is shown, which we should

honour by undertaking at least a minimum effort to not let the knowledge be unjustly forgotten. Departing from the traditional legal understanding of moral interests, I have argued to broaden this concept and also include a fair evaluation of research output as something individual inventors have a moral interest in. Building up the necessary infrastructure to facilitate open innovation models for indigenous communities can help to balance the negative effects of highly uneven distribution of intellectual property rights (problem *c*), by preventing to a certain degree biopiracy and generally by keeping knowledge accessible. Through transparency a fairer assessment of traditional knowledge and other inventions not subject to intellectual property rights becomes feasible (problem *d*).

The sixth and last question examines if there is a proposal to alleviate the negative effects of intellectual property regimes that should be clearly favoured. It became clear during the examination that the extreme heterogeneity of environments and needs, together with extreme inequalities, makes it impossible to clearly favour a single proposal above all others. In order to be politically realizable the examined proposals make vast concessions to gain support from industry and the business sector. However, something that many are more than willing to give up, amounts to an unjustifiable concession toward political feasibility for others. The ambitious plan of ranking the single proposals in accordance to their compatibility to human rights law failed due to the enormous differences in needs and wants among people in the world.

It is important to realize that there is significant room for improvements within the parameters set by the TRIPS agreement. Changes in this direction are already under way. Major pharmaceutical companies are starting to learn about the benefits of hosting open labs allowing them to harvest input from a much wider community, as was mentioned at the end of chapter 4. The Indian Honeybee Network has achieved great results in the promotion of grassroots innovation – this in harmony with the intellectual property regimes and by using the advantages of modern communication technologies (see chapter 7). At the time of this writing a major United States Supreme Court decision limited the extent patents over the use of genetic material can acquired.[430] We will very soon realize the extensive effects of such a court ruling. While those changes raise hope that matters will change for the good, the relentless increase in the wealth gap between the rich and the poor is a matter of such deep moral concern, that it obscures the optimism brought by the latest societal achievements.

[430] Supreme Court of the United States (2013)

Issues in need for further research

There are three unresolved issues to which I will dedicate my attention in the near future. Those are the problems of: antibiotics and the patent bargain, forbidding freeriding on inventions, and making open access publishing for research mandatory.

Antibiotics and the patent bargain. As mentioned in chapter 2, antibiotic resistance undermines the patent bargain for society. This phenomenon does not limit itself to antibiotics. Plants, bacteria, fungi, and many other living organisms develop resistance against active agents introduced to combat them. The rational market practice of maximizing sales for antibiotics is fatal for their long-term efficacy. If the patented antibiotics become useless once exclusive rights over them elapse, the public is missing their *quid pro quo* in return for the favour of recognized exclusive rights.

Freeriding on inventions. Brian Barry once defined freeriding as "taking the benefits … while failing to do one's part in sustaining the practice when it is one's turn to do so"[431]. Arguably under such a definition, freeriding on the benefits of inventions brought up by others would translate to not contributing to their creation. Here we have multiple issues that have to be addressed. First, the inventor rarely grants freedom on how acquirers of innovation are to contribute to sustain the practice of innovating. Contribution possibilities are usually limited to paying fixed monetary sums. Second, when thinking about freeriding the distinction between unwillingness to pay and inability to pay is rarely made. Third, a balance between preventing freeriding and a "recklessly suboptimal use of resources"[432] has to be struck.

Obligations to make research publications openly accessible. Disclosure reduces needless repetition of research efforts, contributing to the efficient use of resources. The easier publications or datasets are to find, the less likely the same type of work will be repeated. This demand is weightier if experiments involving human or animal suffering are concerned. Financial barriers set through high journal subscription prices are unjust hurdles for poorer would-be contributors.
There is however an under-theorized difference. Sharing with some is not the same as sharing with all. Publishing in a specific venue makes one vulnerable to criticism coming only from a particular group. Under freedom of speech we generally allow selective disclosure.

[431] Barry (1982/2008), p. 188
[432] Attas (2008), p. 47

In the long term I want to concentrate on the broader issue of global contributive justice. The idea of contributive justice suggests that work should not only be distributed fairly in terms of general burdens but also that tedious and interesting tasks have to fairly shared as well.[433] Meaningful work allows people to further develop their cognitive capacities and abilities. It makes it possible to recognize the worker as an autonomous agent who can take decisions and is able to follow her own initiatives.[434] One type of work where people find meaning is science and technology development as we amply discussed in the third chapter of this thesis. General norms established by the scientific community[435], intellectual property rights and migration laws limit the chances people have in contributing to scientific enterprises. Here I want to analyse on a much broader extent how international laws and standards should be shaped to support a scientific environment that welcomes a larger number of participants.

[433] cf. Sayer (2009)
[434] cf. Arneson (1987)
[435] cf. ICSU Study Group on Science and Traditional Knowledge (2002)

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Appendix.

Summary

Samenvatting
(thesis summary in Dutch)

Acknowledgements

Curriculum Vitae

Training and supervision plan

Summary

The human right to participate in the advancement of science is frequently overlooked in the intellectual property and global justice discourse. This thesis is a contribution to efforts that aim at filling this gap in the overall discussion on proper incentives for the life sciences.

Three distributive justice problems are raised by our intellectual property regimes (cf. DeCamp 2007). First, high prices make objects of innovation inaccessible, even in those cases where the object is urgently needed (i.e. the accessibility problem). Second, research efforts concentrate primarily in fulfilling the wishes of richer customers. This has lead to the 10/90 gap in pharmaceutical research, the situation where 90% of the resources are destined to solve the problems and desires of 10% of the world population. The consequence thereof is that research and development addressed to make available solutions for the needy is insufficient (i.e. the availability problem). Third, the distribution of intellectual property rights themselves is highly imbalanced between the Global South and the Global North. This brings with itself a huge transfer of resources from the developing to the developed world and it gives intellectual property owners a considerable amount of control over follow-up innovation. The first two problems have attracted a considerable amount of scholarly work and policy studies. Therefore I have concentrated my attention to the third problem and identified a fourth issue that is in need of more careful analysis: the influence intellectual property has on scientific conduct and scientific participation possibilities.

The thesis starts with two introductory chapters, the second briefly exposes the different arguments that justify pro-poor innovation: utilitarianism, compensatory duties, the basic rights doctrine, the human rights and capabilities discourse, recognition theories, cooperative justice arguments, the need to (re)claim the commons and uphold shared scientific values. In the same manner arguments for restricting access are discussed before listing some of the issues that make life sciences special in relation to intellectual property.

The third chapter defends the ethical standpoint sustained throughout the thesis. Using the capabilities approach it is argued that being able to actively care for others should not only apply to efforts made through physical work, but also that one should be in a position to help others by using one's intellectual capacities.

With the help of recognition theories the relation of technological dependency between the Global South and the Global North is criticized. People should be able to mutually influence each other and be able to assist one another. Those two main ideas are used to justify a right to partake in the advancement of science as a peer.

After having set out the moral framework used in the thesis, the state of the debate is presented through a report on a stakeholder conference held in Brussels in September 2011 on the ethical and social aspects of intellectual property in the life sciences. This report constitutes the fourth chapter.

A series of proposals and alternatives have been put forward to alleviate the negative effects of intellectual property regimes. In this thesis three of these are analysed in terms of their strengths and weaknesses: the Access to Knowledge movement, the Health Impact Fund and open innovation models. In order to gain a clearer insight, these alternatives are evaluated by contrasting them to a particular problem. First, the Access to Knowledge movement is analysed in terms of its capacity to improve global health. Then, it is examined how the idea behind the Health Impact Fund could be used to promote the development of climate-friendly technologies. Lastly, open innovation models are tested in regard to their potential to conserve and incentivize innovation in indigenous communities.

Chapter five analyses the access to medicines movement during the last twenty years, describing how the movement changed from being one about corporate social responsibility towards being a matter of justice. The situation where the Global North is developing nearly all the essential pharmaceuticals has some drawbacks for the poor. Medicines are mainly developed to be effective against pathogens prevalent in the Global North and little attention is paid that medicines are still effective in resource poor settings. In addition, market incentives make the development of “me-too drugs” lucrative and generally encourage researchers to enclose their work which often leads to unnecessary repetition of research efforts. The chapter ends with a spark of optimism by presenting some new initiatives that work with “open laboratories”, thus making science a more inclusive endeavour.

Chapter six critically examines the potentials and shortfalls of the Health Impact Fund. The criticism concentrates around the failure to tackle the strong research divide between the Global North and the Global South. The chapter is sceptical about the opportunities to overcome this divide even after considering modifications to the original proposal. The application of a modified version of the Health Impact Fund for propagating climate-friendly technologies is even more problematic than its original use in the context of medicines. Technologies

that help mitigate climate change may have considerable positive side-effects for its users. Incentivizing the fuel efficiency for luxury boats or the improvement of stoves that also reduce the exposure to fumes in crowded households are very different things – having chosen one strategy instead of the other is something that one has to be able to morally defend. The example of biochar is discussed in the chapter. In order to be politically feasible, the drafters of the Health Impact Fund make too broad concessions to major players of the political arena.

The next chapter discusses the third movement. Open innovation models may not be the best alternative to secure the material needs of indigenous innovators. However, they have great potential in protecting the moral interests of these creative minds. Here the idea of moral interest is understood in a broader sense than the one specified by law. Not only do innovators have an interest in attribution of authorship and retaining a control of the integrity of their work, but also in a fair evaluation of their invention. Being unjustly forgotten contradicts this interest. Platforms that make indigenous innovation visible – especially among people living in similar conditions in other parts of the world – have a great potential in addressing this latter interest.

Chapter eight offers a critical assessment of how six prominent proposals relate to the International Bill of Rights. After providing an extensive analysis of how intellectual property affects rights and freedoms protected by human rights law, the three above mentioned alternatives are examined in addition to the wide use of compulsory licences, prize funds and promoting South-South collaborations. During this assessment human rights are not understood in the purely juridical sense, a lay assessment is offered instead. The purpose being that with such type of understanding the origin of much confusion can be understood. The result of this assessment is that the heterogeneity and diversity of needs we find in the world requires a much more complex solution. Some affected parties will often interpret concessions catalogued as minor by one section of the world as being major. A single major amendment will be far from solving this complex problem in its totality.

Throughout the thesis I have been keen to state the need of making science and technology development a more inclusive endeavour. Here I share the same spirit with many other political philosophers in persistently claiming that participation is crucial for a well-functioning society. In the realm of science and technology development participation can only be meaningful if systematic discrimination is absent and sufficient possibilities to learn the needed skills are present.

Samenvatting

(thesis summary in Dutch)

Een van de mensenrechten is het recht van ieder mens om deel te nemen aan de vooruitgang van de wetenschap. Dit mensenrecht wordt vaak over het hoofd gezien in de discussie over intellectueel eigendom en mondiale rechtvaardigheid. Dit proefschrift levert een bijdrage om deze lacune op te vullen in deze discussie met name over de vraag hoe de levenswetenschappen op ethisch verantwoorde wijze kunnen worden gestimuleerd.

De huidigde stelsels van intellectueel eigendoms leiden tot drie problemen ten aanzien van een eerlijke verdeling van objecten van innovatie (vgl. DeCamp 2007). Ten eerste worden deze objecten ontoegankelijk door hoge prijzen, zelfs wanneer er dringend behoefte is aan het betreffende object (het toegankelijkheidsprobleem). Ten tweede concentreren onderzoeksactiviteiten zich primair op het voldoen aan de wensen van rijke afnemers. Dit heeft geleid tot de 10/90-kloof in farmaceutisch onderzoek, ofwel de situatie waarin 90% van de middelen bestemd is om de problemen op te lossen van 10% van de wereldbevolking. Gevolg is dat onderzoek en ontwikkeling die gericht zijn op het beschikbaar maken van oplossingen voor de meest hulpbehoevenden, ontoereikend zijn (het beschikbaarheidsprobleem). Ten derde is de verdeling van intellectuele eigendomsrechten tussen het noordelijk en het zuidelijk halfrond uitermate onevenwichtig. Hierdoor ontstaat er een omvangrijk proces van overdracht van hulpbronnen van de ontwikkelingslanden naar de ontwikkelde landen en hebben houders van intellectuele eigendomsrechten een grote mate van macht over het vervolg van het innovatieproces. De eerste twee problemen hebben reeds geleid tot een aanzienlijke hoeveelheid onderzoekswerk en beleidsstudies. Daarom is mijn aandacht vooral uitgegaan naar het derde probleem. Tevens heb ik een vierde kwestie aangekaart die een meer diepgaande analyse vereist: de invloed die intellectueel eigendom heeft op wetenschappelijk gedrag en de mogelijkheden voor deelname aan de beoefening van wetenschap.

Het proefschrift begint met twee inleidende hoofdstukken, waarvan het tweede in het kort de verschillende argumenten opsomt die innovatie ten behoeve van de armen rechtvaardigen: utilitarisme, compensatieplichten, de doctrine van de grondrechten, de discussie over mensenrechten en 'capabilities', erkenningstheorieën, argumenten van coöperatieve rechtvaardigheid, en de

noodzaak om het gemeenschappelijke domein (terug) te vorderen en gedeelde wetenschappelijke waarden opnieuw te bevestigen. Op dezelfde manier wordt ingegaan op argumenten voor het beperken van de toegang tot innovatie via eigendomsrechten, waarna een overzicht wordt gegeven van de kwesties waarmee levenswetenschappen zich onderscheiden met betrekking tot intellectueel eigendom.

In het derde hoofdstuk worden de ethische standpunten ontwikkeld en gerechtvaardigd, die gedurende het proefschrift worden aangehouden. Met behulp van de 'capabilities' benadering wordt beargumenteerd dat het vermogen om actief te zorgen voor anderen niet alleen van toepassing is op inspanningen op basis van fysieke arbeid, maar dat men ook in de positie moet zijn om anderen te helpen met behulp van intellectuele capaciteiten. Aan de hand van erkenningstheorieën wordt de relatie van technologische afhankelijkheid tussen het noordelijk en het zuidelijk halfrond bekritiseerd. Mensen moeten in staat zijn elkaar wederzijds te beïnvloeden en moeten elkaar kunnen helpen. Deze twee kernideeën worden gebruikt om het recht te verdedigen om als gelijke deel te nemen aan de vooruitgang van wetenschap.

Na het uiteenzetten van het ethisch kader van het proefschrift wordt de toestand van het debat beschreven aan de hand van een verslag van een conferentie van 'stakeholders' (belanghebbenden) in Brussel in september 2011 over de ethische en maatschappelijke aspecten van intellectueel eigendom in de levenswetenschappen. Dit relaas vormt het vierde hoofdstuk.

Er wordt een reeks voorstellen gedaan en alternatieven geboden om de schadelijke effecten van stelsels van intellectueel eigendom te beperken. In dit proefschrift worden drie daarvan onderzocht op hun sterke en zwakke punten: de 'Access to Knowledge'-beweging, het 'Health Impact Fund' en modellen voor open innovatie. Om een zo duidelijk mogelijk beeld te krijgen, worden deze alternatieven beoordeeld in het licht van een specifiek probleem. Allereerst wordt geanalyseerd in hoeverre de 'Access to Knowledge'-beweging het vermogen heeft de mondiale gezondheid te verbeteren. Vervolgens wordt onderzocht hoe het idee achter het 'Health Impact Fund' kan worden gebruikt om de ontwikkeling van klimaatvriendelijke technologieën te bevorderen. Ten slotte worden de modellen voor open innovatie getest op hun potentieel om innovatie in inheemse gemeenschappen te behouden en te stimuleren.

In hoofdstuk 5 wordt de beweging ter bevordering van toegang tot medicijnen gedurende de afgelopen twintig jaar geanalyseerd. Beschreven wordt hoe de beweging evolueerde van een beweging gericht op maatschappelijk verantwoord ondernemen tot een beweging gericht op mondiale rechtvaardigheid. De situatie dat bijna alle essentiële medicijnen worden ontwikkeld op het noordelijk

halfrond, heeft een aantal nadelen voor armen mensen. Medicijnen worden voornamelijk ontwikkeld om actief te zijn tegen de ziektes die veel voorkomen op het noordelijk halfrond en er wordt relatief weinig gedaan om te zorgen dat de medicijnen ook doelmatig zijn voor arme mensen levend in een heel andere context. Bovendien maken de marktprikkels de ontwikkeling van zogenaamde 'me-too drugs' lucratief. Tegelijk kiezen onderzoekers er vaak voor hun werk niet openbaar te maken, hetgeen ertoe leidt dat onderzoeksactiviteiten onnodig worden herhaald. Het hoofdstuk eindigt met een sprankje optimisme: er wordt een aantal nieuwe initiatieven gepresenteerd die werken op basis van een 'open laboratorium', waardoor wetenschap een meer inclusieve activiteit wordt.

In hoofdstuk 6 worden het potentieel en de tekortkomingen van het ‘Health Impact Fund’ nader onderzocht. De kritiek richt zich vooral op het onvermogen van dit voorstel om de sterke verdeling op het gebied van onderzoek tussen het noordelijk en het zuidelijk halfrond weg te nemen. In dit hoofdstuk wordt een sceptische houding aangenomen met betrekking tot de mogelijkheden om deze verdeling te overwinnen, zelfs als er aanpassingen op het oorspronkelijke voorstel worden overwogen. Het gebruik van een aangepaste versie van het ‘Health Impact Fund’ om klimaatvriendelijke technologieën te propageren, is zelfs nog problematischer dan het oorspronkelijke gebruik in de context van geneesmiddelen. Technologieën die bijdragen aan inperking van de klimaatverandering kunnen aanzienlijke positieve neveneffecten hebben voor de gebruikers. Het stimuleren van brandstofefficiëntie voor luxejachten of het verbeteren van fornuizen die tevens de blootstelling aan dampen in volle huishoudens reduceren, zijn twee totaal verschillende dingen. De keuze voor de ene strategie in plaats van de andere moet ethisch verdedigbaar zijn. In dit hoofdstuk wordt het voorbeeld van Biochar besproken. Ter wille van de politieke uitvoerbaarheid, hebben de opstellers van het ‘Health Impact Fund’ te grote concessies gedaan aan belangrijke spelers in de politieke arena.

In het hoofdstuk daarna wordt de derde beweging besproken. Modellen voor open innovatie zijn mogelijk niet het beste alternatief om de materiële behoeften van inheemse innovators veilig te stellen. Ze hebben echter wel veel potentie als het gaat om het beschermen van de morele belangen van creatieve geesten. Hier wordt het concept van moreel belang in ruimere zin geïnterpreteerd dan zoals in de wetgeving gespecificeerd. Vernieuwers hebben niet alleen belang bij het toekennen van auteurschap en het behoud van controle over de integriteit van hun werk, maar ook bij een eerlijke beoordeling van hun uitvinding. Onterecht vergeten worden druist in tegen dit belang. Platforms waarop inheemse innovatie zichtbaar wordt – met name onder mensen die onder vergelijkbare omstandigheden in andere delen van de wereld leven – hebben een groot potentieel om aan dit laatste belang tegemoet te komen.

Hoofdstuk 8 bevat een kritische beoordeling van zes prominente voorstellen over intellectueel eigendom met betrekking tot de internationale regels inzake mensenrechten. Na een uitgebreide analyse van de manier waarop intellectueel eigendom van invloed is op de rechten en vrijheden die worden beschermd door de mensenrechten, worden de drie voornoemde alternatieven onderzocht in het licht van het wijdverbreide gebruik van verplichte vergunningen, prijsgelden en samenwerkingsverbanden binnen het zuidelijk halfrond. Bij deze beoordeling worden mensenrechten niet in puur juridische zin opgevat, maar wordt daarentegen uitgegaan van een lekenoordeel. Het doel daarvan is dat aan de hand van een dergelijk inzicht de oorsprong van veel verwarring kan worden begrepen. De uitkomst van deze beoordeling is dat de heterogeniteit en diversiteit van de behoeften die wereldwijd worden aangetroffen, een veel complexere oplossing vereist. Sommige getroffen partijen interpreteren de concessies die door het ene deel van de wereld als relatief onbelangrijk worden beschouwd, vaak als van groot belang. Een enkele ingrijpende wijziging kan dit complexe probleem nooit in zijn geheel oplossen.

In dit proefschrift wil ik de noodzaak verdedigen dat wetenschap en technologische ontwikkeling een meer inclusieve aangelegenheid worden. Daarom heb ik in dezelfde geest gewerkt als veel andere politieke filosofen die er op hameren dat participatie cruciaal is voor een goed functionerende samenleving. Op het gebied van wetenschap en technologische ontwikkeling kan participatie echter alleen zinvol zijn als er geen systematische discriminatie bestaat en als er voldoende mogelijkheden voorhanden zijn om de vereiste vaardigheden op te doen.

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Curriculum Vitae

Cristian Timmermann received his Magister Artium degree in philosophy at the Ludwig-Maximilians-Universität Munich after completing a thesis entitled "Ethical concerns in living-donor organ transplantation" July 2007. He joined the Applied Philosophy Group at Wageningen University in September 2009. Since then he has been working on this dissertation until July 2013. He is also a researcher at the Dutch Centre for Society and the Life Sciences situated at the Radboud University in Nijmegen, a member of the Dutch School of Philosophy (OZSW), and since December 2011 also part of the School's PhD student council. Part of this thesis was written as a visiting scholar at the University of Manchester and the Fondation Brocher in Geneva.

Early November 2013 he will join the Jacques Loeb Centre for History and Philosophy of the Life Sciences at the Ben-Gurion University of the Negev, Israel, as a postdoctoral fellow.

Training and supervision plan

Dutch School of Philosophy

	Year	ECTS
Courses		
"Intellectual Property Rights" Social Sciences, Wageningen University	2009-10	6
Summer School "Ethics and Economics", Netherlands School for Research in Practical Philosophy (OZSE)	2010	6
"Contemporary Theories of Justice", Netherlands School for Research in Practical Philosophy (OZSE)	2010	6
Winter School "Ethical Theory and Moral Practice", Netherlands School for Research in Practical Philosophy (OZSE)	2011	6
"Trusting Information: Technology, Truth and Transparency", IT University Copenhagen	2011	5
PhD seminars (6x) Netherlands School for Research in Practical Philosophy (OZSE)	2011-13	3
Teaching		
Food Ethics Applied Philosophy, Wageningen University	2009-13	
Ethics and Social Science Applied Philosophy, Wageningen University	2010-12	
Ethics and Biotechnology, Applied Philosophy, Wageningen University	2012	
Analyse van een Probleemveld: Rampen en resilience Disaster Studies, Wageningen University	2012	
Total number of credits (minimum 27 ECTS)		**32**

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