In an environment of globalization, privatization and corporatization, the intersection of commercial law and human rights has raised fundamental questions of international significance for commercial lawyers, governments and non-government organizations alike. This book explores the extent and implications of this intersection, in areas such as the legal responsibilities (actual and potential) of multi-national corporations and obligations under international law, extra-territorial state laws, labour law, anti-discrimination legislation, native title rights, intellectual property, commercial litigation, tax law and the commercial development of biotechnology. The aim of the book is to encourage commercial lawyers to consider the significance of human rights issues for their work and also human rights lawyers and activists to consider the importance of commercial law to their work.
Preface

'Commercial law and human rights?' The title of this book is apt to produce some incredulity. The genesis of the book lies in the belief that the spheres of commercial law and human rights are not and should not be mutually exclusive. Indeed, they never have been; the legal regulation of commerce and thereby, of corporations, necessarily impacts directly on the human beings around which commercial activity revolves. That said, the study of how commercial law does, and how it can, affect the protection of human rights is rare and usually focuses on 'internal' matters such as labour law and health and safety in the workplace, with some extension into the 'external' world in the form of product safety.

What has changed this landscape has been first, the rise, since 1945, of the notion of international human rights norms and their articulation in the forms of international accords and treaties between states, and legislation and court judgments within states. A second and parallel development is a rise in the power and instance of multinational corporations over the same period. Third, and most recently, we have seen the beginnings of recognising the interplay between these two internationalising phenomena.

The implications of this overlap are far from clearly understood. Yet these implications are significant and intriguing. It was against this backdrop that we decided to hold a conference on the subject at the Australian National University in September 1999, to which papers were contributed by human rights and commercial law specialists from the academy, the bench, professional practice, government and activist bodies. The bulk of the essays that comprise this book are drawn from those conference papers.

It must be said also, that another important factor in this enterprise has been that of simple curiosity. We were both curious to see what the each of us (together with like-minded specialists) would make of the other's discipline, or at least those aspects that they perceived to be relevant and overlapping. The results have been illuminating for us and are, we believe, reflected in this the final published product.

Eighteen months have elapsed since the conference and a number of significant and highly relevant events have occurred, including legislation covering corporate codes of conduct introduced into both the Australian
About the contributors

Andrew Bell

Andrew Bell is a member of the New South Wales Bar with a special interest in private international law. He won university medals in Economic History and Law at Sydney University and was Vinerian Scholar at Oxford University in 1993. He wrote his doctorate on the topic of ‘Forum Shopping in Transnational Litigation’. Prior to his post-graduate study, he was Associate to Justice Beaumont of the Federal Court of Australia and, in 1990–91, to Sir Anthony Mason.

Stephen Bottomley

Stephen Bottomley is Professor of Commercial Law and Director of the Centre for Commercial Law at the Faculty of Law, Australian National University. His teaching, research and writing is in the area of corporate law, with a particular focus on corporate governance and corporate theory. He has also published articles on government corporations and government business enterprises.

Peter Drahos

Dr Peter Drahos is the Herchel Smith Senior Research Fellow in Intellectual Property at the Centre for Commercial Law Studies, Queen Mary College, University of London. He holds degrees in law, politics, and philosophy. He has published in law and social science journals on a variety of topics including contract, legal theory, telecommunications, and intellectual property. He is the author of A Philosophy of Intellectual Property (1996) and, with John Braithwaite, Global Business Regulation (1999) (winner of the Hart Socio-Legal Studies Book Prize, 2000).
Des Hogan

Des Hogan is Campaign Coordinator at Amnesty International. A human rights lawyer, his Masters Thesis in European law focused on the detention of asylum-seekers under the European Convention on Human Rights and the International Covenant on Civil and Political Rights. Des has worked for Amnesty International in Ireland (as Refugee Coordinator and Convenor, Legal Network), Amnesty International’s Secretariat in London (as Refugee Officer) and, for the past three years, Australia (as Refugee Coordinator, East Timor Crisis Coordinator and, currently, Campaign Coordinator). He has co-authored several Amnesty International reports, undertaken field missions to Bosnia-Herzegovina and Myanmar and been responsible for providing training to Amnesty International offices in the Asia-Pacific region on campaign strategy, lobbying and media work.

Bryan Horrigan

Professor Bryan Horrigan is a corporate and public lawyer. He teaches in the School of Law at the University of Canberra, where he is also the Director of the National Centre for Corporate Law and Policy Research and the Deputy Director of the National Institute for Governance. He worked as a solicitor in the areas of banking and finance, corporate law, and government services after completing a doctorate in law at Oxford University under a Rhodes Scholarship, and now consults for Allen Allen & Hemsley as well as government agencies. His consultancy work in the public and private sectors covers governmental liability, constitutional law, native title, scrutiny of legislation, and corporate law. His recent academic publications include contributions to the *Oxford Companion to the High Court of Australia* (2001), * Corporatisation and Privatisation in Australia* (1999), *Government Law and Policy* (1998), and *Commercial Implications of Native Title* (1997). He assisted the Queensland Parliamentary Legal, Constitutional, and Administrative Review Committee in producing the web-based Queenslanders’ Basic Rights manual. His email address is bth@management.canberra.edu.au.

David Kinley

David Kinley is Professor of Law and founding Director of the Castan Centre for Human Rights Law at Monash University in Melbourne. He has also taught at the Australian National University, the University of Sydney, the University of Tasmania and at Cambridge University. He has also worked as a Legal Specialist with the Australian Law Reform Commission, and consultant to the Human Rights and Equal Opportunity Commission, and the Asia Pacific Forum of National Human Rights Institutions. He is author and editor of many publications on constitutional law and human rights law including, *Human Rights in Australian Law* (1998). He has designed and taught long and short courses in human rights to official delegations from Vietnam, Indonesia, Bangladesh, Thailand, Myanmar (Burma) and the People’s Republic of China.

Robert McCorquodale

Robert McCorquodale is Professor of International Law and Human Rights in the School of Law at the University of Nottingham, United Kingdom. His previous academic positions were at the Australian National University and the University of Cambridge, after a number of years working as a lawyer with leading law firms in Sydney and London. Robert teaches and researches in the areas of international law, human rights law and constitutional law, with his primary research interest being international human rights law. He has provided advice to governments, corporations, organisations and peoples concerning human rights issues, including advising on the drafting of the new constitutions of Malawi and South Africa. He has also conducted human rights training courses to governments and organisations, including in developing countries.

John McMillan

John McMillan is a Professor of Law at the Australian National University, holding the Alumni Chair in Administrative Law. He is a Consultant to the Government Services Group of national law firm Clayton Utz, and President of the Australian Institute of Administrative Law. He has practised as a public lawyer for 25 years, in a variety of occupations – as Associate to Justice Mason of the High Court of Australia; a solicitor in private practice; a Principal Investigation Officer with the Commonwealth Ombudsman; and self-employed in public interest advocacy. With two
colleagues, he is presently undertaking a large scale empirical study on the impact of court decisions on government administration.

**Sir Anthony Mason**

The Honourable Sir Anthony Mason AC KBE was Chief Justice of the High Court of Australia from 1987 to 1995. Until recently, he was Chancellor of the University of New South Wales, Fellow at the Research School of Social Sciences at the Australian National University, a Judge of the Supreme Court of Fiji and President of the Solomon Islands Court of Appeal. In 1996–97 he was Arthur Goodhart Professor in Legal Science at Cambridge University. Sir Anthony holds Honorary Doctorates from the Australian National University, Deakin, Sydney, Melbourne, Monash, Griffith, New South Wales and Oxford Universities. Sir Anthony’s former positions in Australia include Commonwealth Solicitor-General and Justice of the NSW Court of Appeal. Sir Anthony has been a non-permanent Judge of the Hong Kong Court of Final Appeal since 1997.

**Christine Parker**

Dr Christine Parker is Senior Lecturer in the Law Faculty, University of New South Wales. She holds first class honours degrees in Law and Sociology from the University of Queensland, and a PhD in Law from the Research School of Social Sciences, Australian National University. Dr Parker’s first book evaluated the regulatory and self-regulatory regimes governing the legal profession (*Just Lawyers: Regulation and Access to Justice*, OUP, 1999). She has also conducted extensive research and published widely on internal corporate compliance systems and regulatory policy. A major book, *The Open Corporation: Self-Regulation and Corporate Citizenship*, that draws together this empirical and normative research will be published soon. Dr Parker teaches legal ethics in the Law Faculty at the University of New South Wales. She has also pioneered the popular course, Corporate Compliance and Self-Regulation, which is aimed at equipping corporate compliance practitioners and regulators with skills for managing internal compliance programs.

**Sam Ricketson**

Sam Ricketson practises at the Victorian Bar and is also a Professor of Law at the Faculty of Law at the University of Melbourne. He has written widely in the areas of intellectual property and conflict of laws, and has a particular interest in the international conventions relating to copyright and related rights.

**James Strachan**

James Strachan MA is barrister at law at the Bar of England and Wales. He practises from the Chambers of Elizabeth Appelby QC and David Mole QC at 4-5 Gray’s Inn Square London. His specialist areas of law include public and administrative, planning, commercial and financial services and human rights. He has been involved in many judicial review cases in these areas and has delivered several lectures on the Human Rights Act 1998 (UK) and its implications for legal practice. He visited Australia for three months in 1999 as a Pegasus Scholar with a placement at Malleson Stephen Jaques, Sydney. He is currently co-writing *The Law of Privacy* with Rabinder Singh due to be published by Oxford University Press in 2001.

**Rory Sullivan**

Rory Sullivan is the Convenor of the Amnesty International (Australia) Business Group. He has represented Amnesty International at conferences and seminars and has provided evidence to parliamentary inquiries (including the Multilateral Agreement on Investment (1998), Australia’s Relationship with the World Trade Organisation (2001) and the Corporate Code of Conduct Bill (2001)). Rory holds Masters degrees in Environmental Science and Environmental Law and is currently completing a PhD in Law and Public Policy at the University of London. Rory is the author (with Hugh Wyndham) of *Effective Environmental Management: Principles and Case Studies* (Allen & Unwin, Sydney, 2001). He is the author of over sixty papers and articles on business risk management, human rights and environmental and public policy.
10 The Rights to Food, Health and Intellectual Property in the Era of ‘Biogopolies’

PETER DRAHOS*

Introduction

The legal arrangements for property rights have historically always played a central role in the abuse and oppression of human beings. The slave societies of Ancient Greece and Rome were not just relations of production, but also legal relations. When from the sixteenth to the nineteenth centuries 9.5 million Africans were forcibly transported across the Atlantic they, for the most part, entered jurisdictions where slavery was not illegal. Slavery’s replacement, feudal serfdom, had a legal form, some traces of which still survive today, such as the common law obligation of good faith (fealty) one owes to an employer. Property law has always been instrumental in elevating the interests of men over those of women and children.

Using the last of three millennia of human history as our data set, there is no great inductive leap in suggesting that legal property forms will continue to play a key role in adversely affecting the interests of human beings. The purpose of this chapter is to argue that intellectual property rights over biological resources are likely to provide the legal infrastructure for new forms of power that will be exercised in ways that are inconsistent with the interests of most individuals. In order to develop this argument we will assume that the current set of human rights recognised in international law serve as an adequate description of those interests that individuals all over the world wish to have protected from interference or promoted. So, by way of example, we will assume that the recognition of a right to food

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* Herchel Smith Senior Research Fellow, Centre for Commercial Law Studies, Queen Mary and Westfield College, University of London.

as part of a right to an adequate standard of living in article 25 of the Universal Declaration of Human Rights (Universal Declaration) refers to an interest in having an adequate level of food that is, as an empirical matter, common to most individuals in the world. Whether the 'universality' of the right that represents this interest refers to something beyond international fiat is not something that needs to be pursued for the purposes of the present argument. A second matter that will not be pursued here is the issue of whether intellectual property rights are in fact human rights. If intellectual property rights are human rights—it and it is a big 'if'—then they are human rights of a rather distinctive kind, much more instrumental in character than other human rights, much more the kind of rights of temporary duration that are created by governments in order to serve those needs and interests that are identified as fundamental through our moral and political philosophies.

A further refinement of the issue that this chapter addresses rests on a conceptual distinction between violating a person's right and acting inconsistently with a person's right. The violation of rights involves some direct act of transgression, as for example, when government goons bundle peacefully protesting citizens into cars and drive them to brutal deaths. Acting inconsistently with another person's interest is to act in ways that are at variance, in terms of their ultimate consequences, with that person's interest. So, by way of example, a government authority might be said to be acting inconsistently with the interests that its citizens have in their security when it fails to provide proper street lighting in a particular area, thereby contributing over time to a rise in assaults or robberies. Inquiries into whether or not a decision-maker is acting consistently with someone's interests are often more difficult to decide on empirical grounds since there is no short sharp act of violation to which one can point. Instead there is a process of conduct and decision-making that over time produces consequences. It is only an evaluation of those consequences that allows one to decide whether the relevant decision-maker was acting in a way that was consistent with the interests of those people over which the decision-maker had care. With this distinction in place the focus of the chapter becomes clearer. The question is whether the rules of intellectual property that have been put in place for the ownership of biological resources are consistent with those interests that the Universal Declaration identifies as fundamental 'for all peoples and all nations'. The line of argument, which sometimes emanates from non-government organisations, that intellectual property rights are breaches of human rights, is not pursued in this chapter. Irrespective of whether this is true or not it may still be the case that governments, in setting the monopolistic rules of intellectual property, are doing so in ways that are inconsistent with the fundamental interests of the citizens for whom, as John Locke observed, they act as a 'Fiduciary Power'.

The remainder of the chapter is structured as follows. The section which follows this outlines the three key international instruments that relate to the ownership of biological resources. The third section then suggests that this international regime as it is evolving is likely to lead to three kinds of problems—loss of dynamic efficiency, price problems and a restriction on the capacity of international institutions to provide public goods to developing countries. These problems, it will be argued, have a common source—the problem of intellectual property rights being concentrated in a few hands.

**Markets in biological resources: three pillars of international protection**

The international regime that is emerging for the private ownership of biological resources is underpinned by three international instruments: the Convention on Biological Diversity (CBD), the Agreement on Trade-Related of Intellectual Property Rights (TRIPs) and the International Undertaking on Plant Genetic Resources (IU). These three instruments taken together provide the basis for which we shall term the 'marketisation' of biological resources.
of biological resources. Marketisation refers to a process in which the rules of property and contract are used to constitute free markets in given objects (property constituting the rights in the object and contract facilitating the exchange of those rights).

The objectives of the CBD are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources (see article 1). Various provisions of the CBD suggest that markets are one fundamental mechanism by which the goals of the CBD are to be attained. Article 3 recognises the sovereign right of states to 'exploit their own resources'. Article 11 obliges members to develop economic incentive measures for the conservation and sustainable use of biological diversity. Access to genetic resources on fair and equitable terms (thereby sanctioning contracting over biological resources) is one of the lodestars of the CBD. Similarly, the use of intellectual property rights as a means to encourage the utilisation of genetic resources is expressly recognised in article 16. In article 8(f) the CBD imposes preservationist obligations on states with respect to that indigenous knowledge that relates to the conservation and sustainable use of biological diversity. It also requires states, where appropriate, to encourage the commercial utilisation of that knowledge. In short the provisions of the CBD suggest strongly that markets, subject to the constraint of sustainability, are key to achieving the goals of the CBD. Some developing states, especially those that are sources of biodiversity, are enacting national access laws to regulate access to genetic resources as well as laws to protect indigenous intellectual property in the expectation that the markets in biological resources will flourish to their trade advantage.6

TRIPs was one of the major multilaterals outcomes of the Uruguay Round of trade negotiations, its provisions profoundly shaped by a few key United States multinationals.7 A number of the provisions in TRIPs relate to markets in biological resources, but for reasons of space we shall confine ourselves to a brief discussion of section 5, which deals with patents. Article 27 requires members to recognise both product and patent processes without any discrimination as to the field of technology. The reference to technology would include biotechnology. In biotechnology product patents have been granted on, amongst other things, DNA sequences, genes (including human genes), the products of genes, micro-organisms, transgenic animals and plants.8 Process patents have been granted on fundamental techniques in recombinant DNA technology.

Article 27(2) allows members to exclude inventions from patentability so as to protect ordre public or morality. This exclusion is linked to the prevention of the commercial exploitation of the invention. Ordre public and morality are given an inclusive extension. They include the protection of human, animal or plant life or health and the avoidance of serious prejudice to the environment. The exclusion from patentability cannot be made simply because the exploitation of the invention is prohibited by law.

On the face of it article 27(2) confers a considerable discretion on states to regulate the grant of patents. There is a variety of academic and other opinion on what it is permissible for a state to do under the discretion granted to it in article 27(2).9 The scope of this discretion is a matter of interpretation. The terms of article 27(2) relate to the excludability of inventions that adversely impact on ordre public and morality and not to a category of patenting. In making use of article 27(2) Members will also need to bear in mind their general obligation under article 8 of TRIPs to adopt measures that are 'consistent with the provisions of this Agreement'. A World Trade Organisation (WTO) dispute panel in looking at this article may try and ascertain whether there is some common state practice when it comes to provisions that deal with excludability from patentability. If, for example, it is concluded that it was accepted by many states that exceptions to patent law were to be construed narrowly this might set a limit on the use that states could make of article 27(2). It is, for example, a fundamental axiom of EC and US patent law that exceptions to patent law are to be narrowly construed.10

Article 27(3)(a) gives members a discretion as to the patentability of diagnostic, therapeutic and surgical methods for the treatment of humans or animals. Members also have a discretion as to the patentability of plants, animals, biological processes for the production of plants or animals and plant varieties. If they choose not to grant patent protection for plant

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varieties they are obliged to provide protection by means of an effective *sui generis* system. Article 27(3)(b) makes patent protection mandatory for micro-organisms and non-biological and microbiological processes for the production of plants and animals. There has been a great deal of discussion as to the meaning of 'sui generis' in article 27(3)(b). An analysis based on the ordinary meaning of the term would suggest that a state was free to implement a system of its own design for the protection of plant varieties, or alternatively that it could choose to implement the International Convention for the Protection of New Varieties of Plants 1961 (generally referred to by its French acronym UPOV).\(^1\)

If a state chose to implement its obligation under article 27(3)(b) by means of a *sui generis* system, that system would have to be effective. The term ‘effective’ would be read in the light of the object and purposes of TRIPs, which according to the *Report of the Appellate Body in India – Patent Protection for Pharmaceutical and Agricultural Chemical Products Complaint Proceedings* includes “the need to promote effective and adequate protection of intellectual property rights.”\(^12\) The meaning of ‘effective’ in article 27(3)(b) would, it seems, have to be determined by the need to provide effective intellectual property protection. In order to make sense of this circularity a WTO panel may well look at the practice of states in relation to article 27(3)(b). If, for example, many states were in fact adopting UPOV for the purposes of article 27(3)(b) it might be concluded that that set of standards constituted effective protection. This would not mean that a state would be obliged to join UPOV, but rather that it would have to meet UPOV standards.

In the case of article 27(3)(b) it is significant that the major intellectual property jurisdictions are moving towards a system of multiple protection for biological resources. Recently the US Court of Appeals for the Federal Circuit in *Pioneer Hi-Bred International, Inc v JEM Ag Supply*\(^13\) concluded that plants and seeds for new varieties of hybrid and inbred corn were patentable subject matter under 35 USC 101. The argument that the Plant Protection Act and the Plant Variety Protection Act were to be treated as the exclusive forms of protection for plants was rejected. Although the European Patent Convention contains an express prohibition on the patenting of plant varieties in article 53(b), it is likely that European patent law will evolve in a way that allows this prohibition to be overcome by

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\(^1\) UPOV has gone through a number of revisions, most importantly in 1978 and 1991. There is a vigorous international debate as to the suitability of the UPOV regime for plant breeding. See D Leskien and M Fitner, above n 9.

\(^12\) WT/DS50/AB/R: 57.

\(^13\) (Unreported, US Court of Appeals, Fed Cir, 19 January 2000.)

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means of the drafting of patent claims. For example, in the recent Novartis decision of the Enlarged Board of Appeal on 20 December 1999 it was concluded that it was “in agreement with the rules of logic that a patent shall not be granted for a single plant variety but can be granted if varieties may fall within the scope of its claims”. Article 4(2) of the European Biotechnology Directive\(^14\) will also facilitate a drafting strategy to overcome the prohibition on the patenting of plant varieties. Internationally, members of UPOV signalled the move towards dual protection when the prohibition on the simultaneous use of plant breeders’ rights and patents was abandoned in UPOV 1991.

It is open to question whether the attempt in article 12.3 of the Biotechnology Directive to balance the interests of plant breeders and patent holders by means of compulsory licences will achieve its intended aim. The grant of compulsory licences is a matter dealt with in article 31 of TRIPs: The provision requires, amongst other things, that authorisation be considered on its individual merits, that efforts have been made to obtain a licence on reasonable commercial terms and that the right holder is paid adequate remuneration. Plant breeders faced by complex patent licensing webs over plant material may not be able to make much practical use of compulsory licence provisions that meet the requirements of TRIPs.

The IU represents the last pillar of the marketisation of biological resources, despite the fact that it is based on the principle of common heritage. As we shall see in a moment this principle is coming to play a symbolic role in the IU. During the 1970s developing countries, which had pushed for the recognition of the principle of common heritage of mankind in relation to technological knowledge, began to question the fairness of the application of the principle to plant genetic resources. This issue was discussed by states in the Food and Agriculture Organisation (FAO) and eventually the discussions led to the adoption of the International Undertaking on Plant Genetic Resources in 1983. In its initial conception the IU was “based on the universally accepted principle that plant genetic resources are a heritage of mankind and consequently should be available without restriction” (see article 1). The obligations that the IU created were not tied to a mechanism of legal enforcement. States merely had to report on a yearly basis to the Director-General of the FAO as to the steps they had taken to implement the objectives of the IU (article 11).

Common heritage is an ambiguous concept. It may mean that a resource is not the subject of ownership (that is, in the commons) and therefore it is open to anyone to appropriate, or it may mean that the resource is the

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subject of common ownership and cannot be appropriated without the consent of all.\textsuperscript{15} Essentially, the evolution of the IU suggests that it is the former rather than the latter conception of common heritage that the international community is progressively moving towards.

In resolution 4/89 of the 25\textsuperscript{th} Session of the FAO Conference in Rome 1989 the Conference qualified the principle of common heritage in the IU in the following ways:

- plant Breeders’ Rights were declared not to be incompatible with the IU;
- the discretion of states to impose restrictions on the free exchange of materials that were consistent with their national and international obligations was recognised;
- it was agreed that free access did not mean free of charge; and
- it was agreed that the IU operated on the basis of reciprocity, that is the principle of common heritage no longer applied to all mankind but only to those in states that were part of the IU.

The operation of the principle was further qualified in Resolution 3/91 where it was recognised that nations had sovereign rights over their plant genetic resources and that breeders’ lines and farmers’ breeding material should only be available at the discretion of their developers during the period of development. Clearly, the scope of operation of the principle of the common heritage of mankind has been considerably reduced in the context of the IU.

Beginning in 1994 the IU has been the subject of further negotiations. The draft text as it presently stands is no longer driven by the principle of common heritage. Draft article 1 changes the objectives of the IU. Article 1 of the 1983 IU stated that the objective of the IU was to make plant genetic resources available for plant breeding and scientific purposes. Draft article 1 currently refers to the objectives of the IU as conservation, sustainable use and benefit sharing in harmony with the CBD for the purpose of sustainable agriculture and food security. It is also clear from the present negotiations that the broad multilateral cooperation that was mandated by IU 1983 for ‘plant genetic resources of economic and/or social interest’ will eventually be replaced by a system of multilateral cooperation in relation to a restricted number of crops. By implication those crops that are not expressly listed as being part of the multilateral system will become the subject of bilateral dealing. It is also likely that, in relation to those crops that are part of the multilateral system, access will be further restricted by the purpose for which access is sought.

The process of marketisation that the CBD establishes is limited in that the CBD does not apply to human genetic materials. However, such materials may still be the subject of intellectual property rights provided that they satisfy the criteria of patentability. Another restriction on the operation of the CBD is that it only applies to genetic resources that are provided from in situ conditions or that have been acquired in accordance with the CBD (this has the effect of excluding genetic resources in ex situ collections not acquired in accordance with the CBD). The most important ex situ collection of plant germplasm is that held by the members of the Consultative Group on International Agricultural Research (CGIAR).\textsuperscript{16} In 1994 members of the CGIAR and the FAO concluded an agreement that placed collections of ‘designated germplasm’ under the auspices of the FAO. Under the terms of that agreement each centre that is part of the CGIAR system has to hold the designated germplasm ‘in trust for the benefit of the international community’ (see article 3(a) of the agreement).\textsuperscript{17} To this end each centre is obliged not to claim legal ownership over the designated germplasm or seek any intellectual property rights over it (see article 3(b)). When a centre transfers designated germplasm to an institution, it must make sure that the institution is bound by the same conditions relating to ownership and intellectual property that apply to that centre. The agreement creates in effect an international common pool for designated germplasm. The size of this common pool is affected by the following restrictions:

- the trust obligation relates only to designated germplasm and not to all the biological resources that a centre may hold;
- the obligation to ensure that the designated germplasm does not become the subject of intellectual property rights does not apply to states that repatriate germplasm that they have provided;


\textsuperscript{17} A copy of the Agreement is available in CGIAR CGIAR Center Statements on Genetic Resources, Intellectual Property Rights, and Biotechnology (World Bank, Washington DC, May 1999).
the centres face a problem when it comes to enforcing the terms of the Material Transfer Agreements they use;\textsuperscript{18} new accessions can only be given the status of designated germplasm if they are free of legal restraints in the first place;\textsuperscript{19} the common pool of designated germplasm that is constituted under the FAO/CGIAR agreement does not prevent cells, organelles, genes or molecular constructs derived from that germplasm from being patented, provided that the relevant CGIAR centre gives permission;\textsuperscript{20} and the common pool of designated germplasm can be used to develop proprietary products under UPOV.\textsuperscript{21}

The marketisation of biological resources has been considerably advanced by TRIPs because it makes a monumental contribution to the globalisation and harmonisation of intellectual property rights. One hundred and thirty-six countries are now members of the WTO and are, therefore, obliged to implement the provisions of TRIPs. TRIPs now constitutes the platform of standards that serves as the starting point for bilateral and regional free trade negotiations on the protection of intellectual property. Such negotiations are continuing apace, being mainly driven by the EU and the US. Significantly countries like India that had previously been critics of higher standards of intellectual property protection are now more or less fully integrated into a globalised system of intellectual property protection. The CBD is contributing to rather than detracting from the presentisation of the biological commons. Property rights alone do not guarantee that mutually beneficial exchanges will take place between individuals. Exchange also depends on a suitable regime of contract rules. The CBD has contributed to the development of a contractual regime for biological resources by triggering the development of access regimes by states. The CBD has also led to an emerging \textit{sui generis} regime of intellectual property rights in indigenous knowledge related to the biological diversity. Very few biological resources and little knowledge will fall outside of the bargaining processes that are framed by the CBD, TRIPs or the IU. Access to plant germplasm of the kind first envisaged under the principle of common heritage under the IU will be limited only to that germplasm covered by the multilateral system and then only for limited purposes. Access to biological resources covered by intellectual property rights will be dependent upon bargaining with compulsory licensing and/or competition law playing only a restricted role.

In short, biological resources are becoming part of a global and increasingly liquid market. The commercial actors that are likely to do best out of this market are a small group of multinational players (biogopolists) because they:

- can afford to acquire the most valuable intellectual property rights;
- can develop intellectual property portfolios to shield themselves from competitors;
- have research and development (R&D) capabilities to utilise the biological knowledge that is the subject of property rights; and
- have an advantage in marketing and distributing their products.

The costs of 'biogopolies'

The long run evolution of the different markets in biological resources (for example, markets in agriculture, markets in food, markets in pharmaceuticals) is, of course, anybody's guess. One fundamental policy concern is whether the markets in biological resources will assume an oligopolistic structure. The Nuffield Council in its report observed that there were:

- six major industrial groups who between them control most of the technology which gives them the freedom to undertake commercial R&D [research and development] in the area of GM [genetically modified] crops. These are:
  - Agrevo/Plant Genetic Systems, ELM/Neap/Semgrows/Enseminis, Du Pont/Pioneer, Monsanto/Calgene/Madelbic/Agracetus/PBI/HybriTech/Delta and
  - Pine Lane Co, Novartis, Zeneca/Mogen/Avanta.\textsuperscript{22}

In its report \textit{EC Regulation of Genetic Modification in Agriculture} the Select Committee of the British House of Lords also warned of the problem of cartels and monopolies in the agrochemical/seed sector, pointing out that

\textsuperscript{18} This has been recognised by the FAO and the CGIAR centres in CGIAR Second Joint Statement of FAO and the CGIAR Centers on the Agreement Placing CGIAR Germplasm Collections under the Auspices of FAO (World Bank, Washington DC).

\textsuperscript{19} See CGIAR Guidelines for the Designation of Accessions under the FAO Agreements (World Bank, Washington DC, 1999).

\textsuperscript{20} CGIAR Guiding Principles for the Consultative Group on International Agricultural Research Centers on Intellectual Property and Genetic Resources (World Bank, Washington DC, 1999).

\textsuperscript{21} Ibid.

the degree of consolidation was already much greater than in the pharmaceutical sector. A 1997 study by Krattinger in reference to the Bt patents showed that the then six major company groups held about 60 per cent of the 410 patents which related to the Bt gene and Bt pesticide technology. The effect of this concentration of patent ownership was to enclose research on the manipulation of cry proteins, which have selective application to the various agricultural pests.

The problem of biopolies is not a new problem, but one that is rooted deep in a past that has seen multinational elites use intellectual property rights to capture massive rents from new technologies. Synthetic hormones and quinine are examples of essential medicines the supply of which has been affected by international cartels employing intellectual property rights.

Biopolies are not, at least from a secular economic perspective, inherently bad. It may be true, for example, that in the case of certain kinds of very expensive research such as drug research an oligopolistic market structure, in which the commercial actors use intellectual property to extract monopoly rights, may be the only way in which certain kinds of important research gets done. Monopoly rents may simply be the cost that society has to pay in order to achieve some sort of optimal allocation of resources to the market for invention and innovation. The problem with this argument is that it is an a priori argument based on certain assumptions about the use and effect of property rights. Moreover, the argument still leaves open the very difficult question of how the property right itself should be designed in order to minimise the allocative efficiency loss that flows from the use of monopoly rights to correct for market failure in markets for information. All the interesting questions in intellectual property turn out to require complex empirical answers and these are unfortunately in short supply. This said, it is clear that there is enough evidence to suggest ‘biopolies’ may surface in the industrial use of genomic information in much the same way that international cartels became a structural feature of the chemical and pharmaceutical industries in the twentieth century. The next section identifies three problems that the presence of biopolies may create and draws attention to the potential costs of these problems for human rights as they relate to food and health.

24 A F Krattinger, Insect Resistance in Crops: A Case Study of Bacillus thuringiensis (Bt) and its Transfer to Developing Countries (Ithaca, New York, ISAA Briefs No 2, 1997).

The two sectors in which a biotechnology based on genomics is likely to make the greatest contribution are food and health. Genomics will enable the redesign of crop plants and the development of new rational drug targets for major common human diseases. International human rights law recognises both a right to food and to health. The right to health is recognised in article 12 of the International Covenant on Economic, Social and Cultural Rights (ICESCR). The right to health is really a group of rights that have complex public health dimensions that cut across other rights (for example, measures taken to prevent epidemics) as well as grounding some set of individual entitlements to health care. It has proved difficult to secure agreement on the set of correlative duties that flow from its recognition as an individual right. The right to food (along with the right to medical care) is recognised in article 25 of the Universal Declaration and article 11 of the ICESCR.

The economic justification for intellectual property rights that are related to the origination of new products is that the exclusivity that they confer (the exclusivity being defined differently for each kind of right) contributes to the dynamic efficiency of the market in invention and innovation. The empirical evidence that patents, for example, actually function in this way or function in a way such that costs exceed benefits is much less clear cut. Recent economic work suggests that tacit knowledge flows are far more important to invention and innovation than realised. The patent system, it would seem, makes little contribution to such flows and in fact may inhibit them. Strengthening the patent system may have a negative effect on innovation, for stronger patent rights may in fact disrupt the fragile networks of communication upon which innovation is dependent. One implication of this research is that the markets in invention may not be subject to the degree of market failure first thought. Related to this is the view that the costs of the patent system may be much greater than we realise. Broad patents, which are more or less inevitable in new areas of technology, may slow research. Since, from the point of view of social

29 For a discussion see A Eide, ‘The Right to an Adequate Standard of Living Including the Right to Food’ in A Eide, C Krause and A Rosas (eds), above a 2, 89.
welfare, it is diffusion of the invention that matters most, there is a strong argument that we ought to be concerned with protecting follow-on research. The policy upshot of this analysis is that we should be thinking about the issue of intellectual property protection in a much more nuanced way. In the context of innovation and invention in genomics we have to be sensitive to the possibility that by increasing the strength of the patent system we may not actually be contributing to dynamic efficiency in the food and health sectors and may in fact be reducing it. In the words of a recent European report 'it is important to bear in mind that overstrong IPRs [intellectual property rights] can discourage innovation as well as weak IPRs'. It might also be added that we have some insight into the potential innovation costs of intellectual property from the recent litigation by the US government against Microsoft under the Sherman Antitrust Act. There it was found that copyright was used by Microsoft to prevent PC manufacturers from altering Windows 95 and Windows 98 in ways that would allow the company Netscape to develop a browser platform that competed with Microsoft’s own Internet Explorer.

Even if the shift towards the marketisation of biological resources by means of intellectual property rights produces dynamic efficiencies in food and health, it seems probable that the benefits of these gains will in global terms be unequally distributed. Intellectual property rights are not rewards in themselves but rather help to create the opportunities for a reward in markets. Assuming patent holders to be rational actors one would expect them to carry out R&D in those markets where the returns were likely to be the greatest. This market rationality probably accounts for the fact that only 1 per cent of the new chemical entities marketed between 1975 and 1997 related to tropical diseases. The bulk of the world’s population lives in developing countries where tropical diseases are a problem so demand is not the issue. Rather it is the ability to pay. The following statistical snapshot on annual drug expenditure per capita tells the story: Japan $411, US $191, Germany $111, Mozambique $1, Bangladesh $1, and India $3. In short it will be more profitable for a transnational pharmaceutical company to invest money in R&D on slimming pills than on a tropical disease that affects the populations of least developed countries. Clearly a market system that relies significantly on patents to generate investment in drug research has not met the interest in health of all people in relation to the production of drugs for people in developing countries. Nor would one expect that patents in genomics will see any significant reversal of trend in which the 15 per cent of the world’s population that resides in industrialised countries consumes 86 per cent of the world’s drug supply. The promise of genomic-based technologies to liberate ‘us’ from disease refers to a largely western industrialised ‘us’, for the simple reason that the direction of patent-based research is determined by ability to pay.

Related to the issue of ability to pay is the issue of the price effects of global intellectual property standards on health and food products. In the past, pharmaceutical companies have used the device of patent pooling to form cartels over the supply of drugs to the market, the cartel over the supply of broad-spectrum antibiotics being one such example. Setting aside the problem of cartels, which remains real enough, there is the issue of what a globalised patent term of 20 years, together with the requirement that patents be granted for products as well as processes, will do to the price of drugs in developing countries. The thrust of the studies undertaken thus far are summarised by Correa:

> Though the results of the various studies undertaken on possible price increases for medicines vary significantly, there is no doubt that patents lead to prices higher than those prevailing without protection. The generation of monopolistic rents is, in fact, the very purpose and essence of the patent system.

What one can say with confidence is that certain developing country strategies based on the use of the patent system to deliver cheap drugs to their populations are no longer an option under TRIPs. India, for example,

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33 United States of America v Microsoft Corporation Civil Action No 98-1232 (TPJ).


35 Z Mirza, ‘WTO/TRIPs, Pharmaceuticals and Health: Impacts and Strategies’ (1999) 42(2) Development 92, 93.

36 Z Mirza, n 34.


38 See TRIPs, articles 27.1 and 33.

39 C Correa, ‘Trade Agreements on Intellectual Property and Public Health in Developing Countries’ in Globalisation and Access to Drugs (DAP Series No 7, World Health Organisation, Geneva, 1999) 82. For a summary of the studies that point to welfare losses in the area of pharmaceutical studies as a result of TRIPs see Z Mirza, n 35, 94.
refused to grant product patents on pharmaceutical compounds as part of its health care policy. The purpose of this prohibition was to encourage Indian industry to develop processes that would deliver cheaper drugs to the Indian population. This patent strategy was part of a strategy to become self-sufficient in pharmaceutical drugs. The Indian pharmaceutical industry grew from around one hundred million rupees in 1947 to seventy billion rupees in 1996 and India became a major player in global generic drug markets. Under TRIPs India is obliged to grant product patents on drugs. The issue for India, and other countries such as Nigeria and Nepal that depended on cheaper drugs from India, is whether there is an alternative industrial development strategy that will enable the delivery of cheap drugs to their populations. Such strategies may emerge over time, but at the moment it is clear that the strengthening of patents through TRIPs will bring with it price rises that the populations of developing countries can ill afford. The claim that stronger intellectual property rights will stimulate necessary levels of R&D investment in the pharmaceutical sector is, to date, not supported by the evidence. In developing countries such as India where there is a strong domestic industry, one possible outcome of TRIPs is that entrenched domestic players may well end up capturing the monopoly rents that TRIPs creates. An argument sometimes put by the pharmaceutical industry is that stronger patent protection will encourage price discrimination in favour of developing country consumers. But this is a suspect argument. Even if transnational pharmaceutical companies decide to service all developing country markets in this way, they may not price discriminate so that the prices of drugs fall to affordable levels for the general populations of these countries. Instead, they may simply price the drugs to achieve a profit in a particular segment of a developing country market.

The final issue that biopolitics give rise to is their potential impact on the capacity of international institutions to provide public goods to developing countries in the agricultural sector. Here it is worth noting that the right to freedom from hunger in article 11(2)(a) of the ICESCR imposes an obligation on states to ‘improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge’. The obligation to ensure the uptake of technical and scientific knowledge requires states to keep a weather eye on intellectual property regulation since such regulation has an important effect on the utilisation of technical and scientific knowledge. However, states have stood by while the private sector has engaged in something of a patent frenzy in bioethanol in recent years, a frenzy which has produced the following:

- Japan and the US securing ‘rights to 70 per cent of EPO patents for human gene sequences’; and
- US companies developing ‘aggressive’ patenting strategies in relation to genomic information, and European multinationals responding by investing in the dynamic US SME biotechnology sector in order to gain access to this information.

The impact of high levels of biotechnological patenting on the different markets in which genomic information is or will be relevant is essentially a matter of guesswork. This guesswork can be informed by different kinds of studies including, for example, an examination of the licensing practices of companies in different sectors such as pharmaceuticals and agrobiotech. Here it is worth noting that patent licensing strategies have been poorly studied. The consequences to market structure of different strategies of patent blanketing, fencing and surrounding is, at an empirical level, far from well understood. Large companies, often originally chemical companies, such as Du Pont, that now present themselves as ‘life sciences’ companies have developed a patent tradition and culture that stretches, in some cases, back to the beginning of the last century. They have a matchless expertise in the use of patents as a weapon of business that covers many of the last century’s most important technologies.

It is clear that this patent-driven business culture is expanding in ways that may profoundly affect the capacity of international institutions such as the CGIAR system to deliver public goods in the form of better agricultural technologies to developing countries. The CGIAR system has to date been driven by a public good culture as it has sought to fulfil its mission of contributing ‘through its research, to promoting sustainable agriculture for food security in the developing countries’. Each of the centres that make up the CGIAR system uses biotech tools in order to carry out its research mission. Increasingly these centres are finding that these tools are the subject of proprietary control. A study concluded in 1998 by the

41 C Correa, above n 39.
43 See S M Thomas and N Simmonds, above n 26.
45 The mission statement of the CGIAR is available at <http://www.cgiar.org>.
International Service for National Agricultural Research (ISNAR) revealed that selectable markers, promoters and transformation systems were the most heavily used types of proprietary technologies by CGIAR researchers. Another CGIAR investigation into this issue reported the following:

We are concerned by the results of our poll of Centres. In nearly half the cases in which the Centres were using proprietary biotechnology, they were uncertain whether the results of their research could be applied freely (or at all). 47

Within the CGIAR system, as well as outside of it, there are real fears that the race to propertise biological knowledge will adversely affect the capacity of the system to fulfil its public good mission. These fears are well-founded. In an era when biopolitics come to dominate the ownership and use of biological knowledge a public good system like the CGIAR will find it increasingly difficult to carry out its work. The real problem, which to date has received little discussion, is that the CGIAR system will be seen by biopoliticos as a competitor in developing country markets in much the same way that public libraries have come to be seen as competitors by copyright owners. In biotechnology and agriculture it is likely that much research will end up as an international rather than public good and that it will be distributed according to complex licensing structures. It will be more or less impossible for the CGIAR system to remain outside of this paradigm of propertised biological knowledge. The impact of these developments on the agricultural systems of developing countries remains a matter of conjecture. It is clear that free access to technologies in the agricultural sector will remain crucial to poverty alleviation. 48 Exactly how this access will be maintained in an era of biopolities is far from clear. In this context it is also worth recalling Kenneth Arrow's seminal work on markets in information. 49 Arrow argues that problems of indivisibilities, uncertainty and appropriation will mean that a society will have to rely on a complex mix of private and public organisational forms in order to ensure an optimal allocation of resources to invention. The globalisation of intellectual property rights via TRIPS threatens this mix. It contributes to a process of marketisation of biological resources that will not, for the kind of reasons that Arrow articulates, produce optimal outcomes in agricultural and health sectors.

Conclusion

In the closing decade of the twentieth century the marketisation of biological resources proceeded apace. The transnational companies that dominated the twentieth century chemical industry are likely to become the biopoliticos of the twenty-first, dominating the various industrial uses of genomic data. The consequences of this domination in the health and food sectors are likely to be threefold: lower levels of dynamic efficiency; social welfare losses in terms of price increases for products; and the impairment or possible destruction of an international public good system in agriculture that currently serves developing countries. None of this is consistent with the interests in food and health that the present international rights framework recognises. Moreover, it can be plausibly claimed that the interests of individuals in food and health are genuinely universal. They do not suffer from the cultural relativities that are sometimes said to afflict other human rights. In accepting the globalisation of intellectual property rights in a slavish fashion governments cannot be said to be responsibly exercising the fiduciary power referred to by John Locke. Intellectual property rights, like property rights in previous centuries, define rules of access to resources that determine the future of us all. The regulatory design issues in intellectual property cannot be separated, as they have been in the past, from human rights discourse. For all its imperfections that discourse offers us the best hope of a common conceptual framework for approaching these design issues in a way that attends to our fundamental interests. Few interests can be more fundamental than the ones we have in food and health.