UNIVERSITIES as the GATEKEEPERS of the INTELLECTUAL PROPERTY of INDIGENOUS PEOPLE'S MEDICAL KNOWLEDGE

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Abstract

This paper will explore the role of universities as one of the most important gatekeepers that facilitate the appropriation of Indigenous Medical Knowledge (IMK) from Indigenous communities to transnational pharmaceutical corporations. The first section will deconstruct the "denial of dependency" upon IMK. Using case studies, the critique will demonstrate a complex mystification of Indigenous knowledge and labour, and a de-identification of Indigenous people and nature as the source of the medicines appropriated. The last section will analyse the law and policy context of the past 20 years that is responsible for creating a process of academic capitalism that has strengthened this phenomenon.

Introduction

> Patent papers were shipped to me ... I really had a difficult time signing these, because they wanted me to assert that I'd invented this stuff, and my thought was, I didn't invent anything; I learned this from two old ladies. They told me they learnt this from their mothers, who learned it from their grandmothers, who learned it from their great-grandmothers, so I felt in some way that I was holding intellectual property that belonged to the entire Samoan people (Cox cited De Blas, 2005, para. 12).

The majority of all plant related pharmaceutical products, or roughly 25% of the entire pharmaceutical market (Duke, 1993; Farnsworth et al., 1985; Kate & Laird, 1999) contains significant elements of direct contribution from the appropriation of Indigenous knowledge. The figure of 77% becomes even more significant when one considers that a World Bank report recently estimated that plant related medicinal products would reach a global value of US $5 Trillion dollars by 2050 (WIPO-UNEP, 2004). Apart from modern pharmaceutical usage, traditional systems of medicine and alternative and complementary medicine represent up to 50% of use in many industrialised countries and up to 80% in many developing nations (Bodeker & Kronenberg, 2002). Over three billion people worldwide utilise plants for their primary healthcare (Walsh, 2003). Combining the Indigenous contribution to pharmaceutical medicine with its traditional use worldwide indicates that Indigenous knowledge may be responsible for over 60% of medical treatment in developed nations and 85% in developing nations.

The role of universities as one of the most important gatekeepers that facilitate the appropriation of Indigenous medical knowledge (hereafter IMK) from Indigenous communities to transnational pharmaceutical corporations has not been significantly explored before. In this paper, I will offer an analysis of this phenomenon using several disciplinary methods with a transcultural epistemological approach involving an appreciation of spiritual, scientific and legal dimensions to the problem. This first focus will

be upon a deconstruction of the background "denial of dependency" upon IMK. This is an adaptation of ecofeminist analysis that critiques both the masculine denial of dependency on the feminine and upon nature (Plumwood, 1994). This denial involves a complex mystification of Indigenous knowledge and labour, and a de-identification of Indigenous people and nature as the source of the medicines appropriated. The next step will be to analyse the law and policy context of the past 20 years that has specifically been responsible for strengthening the IMK appropriation role of universities as gatekeepers. The cultural milieu of universities this has created will be explored more specifically and is referred to as "academic capitalism". It will be suggested that this has created a shared crisis for both Indigenous and university communities. This shared crisis presents an opportunity for a paradigm shift that can reverse some of these processes of appropriation towards an honoring of Indigenous custodianship of IMK.

Underlying the appropriation of IMK is a commercialisation process whose reductionistic materialism is increasingly impairing the ability of science and law to reflect more realistic models of reality that value interdependent relationships, an essential spiritual principal. The consequences of this are not just abstract philosophical or theological considerations, but have practical negative consequences for people of Indigenous and Western backgrounds (Posey, 2002). This materialistic epistemology that effectively devalues Indigenous knowledge to an instrumental economic resource contributes to the extinction of both cultural and biological diversity (Maffi, 2001; Stepp et al., 2002) and has impaired the development of effective medicines (Elvin & Elvin-Lewis, 2003). This objectification of IMK as "primitive" has likely led to the extensive loss of human life for example causing decades in the delay of the development of an effective malaria treatment due to not consulting the original custodians (Lei & Bodeker, 2004).

This reductionistic materialism and narrow definitions of technology have contributed towards contemporary society not being aware of how the effectiveness of Indigenous medicines is not merely based on the identification of one particular bioactive compound but upon sophisticated and advanced knowledge systems that are a lived experience. This effectively excludes any holistic spiritual principles of Indigenous knowledge from consideration or value. As the Indigenous knowledge systems themselves are not valued, it also exacerbates the ability to value the intrinsic worth of Indigenous peoples themselves. This has wider consequences in the objectification of Indigenous peoples as "primitive peoples" which impacts the development of inappropriate government policies that fail to engage this spiritual value of the Indigenous person and community as humans of dignity and worth. This leads to the creation of policies that impair the capacity for Indigenous self-determination, and which reinforce inappropriate models of Indigenous dependency on Western governments. In a powerful irony, the *reverse* is true when it comes to the Western health systems. There has been a substantial denial of Western dependency on Indigenous medical knowledge which has powerful symbolic meanings.

The economic and spiritual value of IMK has remained largely absent from the public mind and is reflective of a Western denial of dependency that obscures how Western peoples are dependent on Indigenous peoples for their own health systems. Upon the colonisation of Australia, Europeans encountered unique diseases and poisonous flora and fauna. Combining this with sometimes depleted stores of their own medical supplies, colonists depended upon Aboriginal people to teach them alternative and new forms of medicine appropriate to this new environment (Cribb & Cribb, 1981; Low, 1990). Parallel historical processes resulted in eventually almost half of the U.S. list of Pharmacopeia consisting of Native American medicines (Vogel, 1970). This was a significantly Indigenous national pharmacopeia whose worldwide utilisation through multi-national pharmaceutical corporations increased in proportion to the globalisation process.

This denial of dependency can be an explicit strategy of powerful policy making institutions such as APEC with interests in supporting the strengthening of international intellectual property regimes such as TRIPS, who are funded by pharmaceutical interests (PhRMA). APEC released a statement to coincide with the eighth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP 8) held in Curitiba, Brazil from 20 to 31 March, 2006. This is a statement that gives a good example of an explicit denial of dependency of Western health on both Indigenous peoples and nature:

> **Unsupported by facts**
> There is no evidence that Brazil or anyone has massive undiscovered lodes of "Green Gold" or that there is one case of illegal removal of genetic resources from any country.
>
> The number of instances where great financial benefits have flowed from commercialisation of natural genetic resources are small. Science can now create almost any compound and engineer any gene in the laboratory.
>
> Research by the Australian APEC Study Centre at Monash University revealed that there are virtually no cases of biopiracy (defined as forcible and illegal removal of property) as claimed by the Secretariat to the Convention on Biodiversity,

> UNEP and non-governmental organisations like the Third World Network (Oxley, 2006, p. 1).

Note the reliance on a fairly extreme definition of biopiracy as "forcible and illegal removal of property" in order to justify their argument. If a more realistic definition of biopiracy includes broader definitions of misappropriation that includes concepts such as use of Indigenous knowledge without prior informed consent a different story unfolds.

The denial can be a more subtle process of several layers of historical filters that intensify the dilution of origins. Each narrator, (perhaps sometimes unconsciously as a function of the ego) minimises the contribution of the previous, until eventually, the last edition of the narrative justifies the ownership of the patented drug by only naming the authors of the patent. An example of this is the case of the $10 billion dollar blockbuster cancer drug Taxol, originally bioprospected from the Pacific Yew in Washington State and patented by the pharmaceutical company of Bristol-Myers Squibbs (BMS). Nearly all accounts of this drug development are silent on the fact that the Pacific Yew was and still is used as a cancer medicine by local Native American Tribes such as the Tsimshian Tribe (Compton, 1993). This dilution of history does not just render the Indigenous agency invisible, but also the intermediate agents between the Indigenous community and the Pharmaceutical company. This may be reflective of struggles between competing powerful institutions over the rights of ownership and shares in enormous amounts of money. In the Taxol case this is between the National Institute of Health, whose employees were the postgraduate assistants and the bioprospector, and BMS whose scientists managed to have their names on the patents after further synthesising the compound. In the Taxol case, the accounts are sometimes silent on the bioprospectors name and are always silent on the names of his three postgraduate assistants. It is also never mentioned that the bioprospector did not just collect, but also originally identified the bioactive compound in the lab according to his widow (Kavelin, 2008). All available accounts present the collection method of the relevant National Cancer Institute program as entirely "random" never mentioning the fact that the original "bioprospector" was trained by, and worked with eminent ethnobotanists (Kavelin, 2008) whose research methodology is to use local IMK in their bioprospecting efforts. Yet again, this denial of dependency need not be an active denial or complete historical erasure, but can be represented as the dilution of Indigenous agency to an abstract "ghostly presence" (Pratt, 1992). On this Johnson and Murton (2007) write:

> Indigenous guides did impart their knowledge concerning the specific plants and animals encountered along with information concerning how these specimens fit within their cultural, political and economic institutions. If this knowledge was shared and encountered why does it, and those who shared it, remain hidden, or as Pratt describes, ghostly presences in the accounts of these explorers? (Johnson & Murton, 2007, p. 123).

An example of this is the case of arguably the most widely commercialised cancer herbal remedy in the world, Essiac, which was appropriated from the Ojibwa peoples (Ashewood, 2005), whose name was changed after appropriation, (A modified reversal of the name of the Western "discoverer" "Cassie") and is described as having come from a "medicine man" of the Ojibwa tribe. One might question the past tense phrase "that was used" in the Australian Senate report as a perhaps non-intentional, but effective dismissal of the living culture which still preserves and carries this knowledge (The Ojibwa being the largest Native American Tribe in existence) and has not "passed it on" just prior to an implied extinction in the 1920s (effectively when their participation in this "story" of Essiac concludes). Because of this mystification and denial of dependency process which includes changing the name of the medicine, often the contemporary Indigenous communities are not even aware of the commercialisation of their IMK. I found this was the case with Essiac when I contacted the president of one of the main Ojibwa tribes' cultural council in Michigan. I passed on the information about Essiac gathered in my research and the president of the cultural committee subsequently consulted with several Ojibwa traditional healers and later advised they were not aware of the renaming and subsequent appropriation of their herbal remedy (Kavelin, 2008).

The infamous case of the San Peoples IMK of Hoodia, the source of a potential multi-billion dollar weight loss drug is a well-known example of this denial of dependency and mystification phenomenon whose exposure contributed to greater ethical standards of benefit sharing. Chennells reports:

> When asked whether the San peoples, from whom the traditional knowledge on the product had been derived, had been properly consulted with or were to be financially compensated, the head of Phytopharm was quoted as saying that to the best of his knowledge, the San tribe that had provided this knowledge was unfortunately extinct (2007, p. 421).

Of course, the San people are one of the largest tribes in the southern region of Africa and the embarrassment of calling them "extinct" was a significant factor in creating one of the highest percentages in a benefit sharing agreement known. Although subsequent complicated factors have affected

the likelihood of a successful implementation of the agreement, this demonstrates that a deconstruction of this denial and mystification process can have very positive consequences.

This "mystification" of Indigenous knowledge and labor is a denial of dependency on social relations that justifies the legitimacy of the monopolies of the powerful who now own the medicines. This allows for the peril of ignoring the negative effects of an overly materialistic/capitalistic system of intellectual property in the social fragmentation of humanity. This fragmentation largely occurs because of the fostering of extremes of wealth and poverty caused by the increasing appropriation of the "commons" by those in power. This is reflected in a significant pattern of economic disparities mirrored in the standard feminist and Indigenous critiques of socially unjust objectification of a hierarchy of relationships.

Bioprospecting/biopiracy reflects the principles of these inequitable relationships for Indigenous peoples because it is a practice and industry embedded in a legal and educational system increasingly designed to enable the corporate appropriation of knowledge. *Even if the scientists working with IMK are trustworthy, the system they must work within is not*. The inadequacy of Western intellectual property law to protect Indigenous medical knowledge from appropriation has been sufficiently demonstrated in a great range of work over the past two decades (Fourmile, 1995; Janke & Quiggan, 2005; Mgbeoji, 2006; Posey, 2002; Shiva, 1997). Courts have increasingly attempted to formalise and naturalise the bundles of rights classified as property interests. This reflects a trend of moving further away from the normative question of whether a regulation imposes an unfair distribution of social obligations (Bryan, 2000; William & Beerman, 1993). The naturalisation of the bundles of rights approach increasingly legitimises one cultural norm as a global standard. This obscures and devalues the diversity of Indigenous customary legal frameworks that have managed to successfully regulate their own intellectual property between themselves and other communities for thousands of years. The Court interpretations that increasingly favour formalising the intellectual property classification system allows corporations to rely on technical arguments to legitimate ownership and appropriation, yet it leaves Indigenous communities no recourse to utilise evidence of cultural and social inequality and oppression. While the inability of Western law to adequately protect IMK has been extensively discussed, particularly on an international level, there has been almost no investigation of the roles of universities as perhaps the most significant gatekeepers in the appropriation process of that knowledge.

Why is it important to acknowledge universities as such gatekeepers? In examining the seminal work of "Global Business Regulation" Braithwaite and Drahos offer "five strategies for NGO's to intervene in webs of regulation to ratchet-up standards in the world system". Changing "NGO's" to "Indigenous peoples organisations" highlights the emancipatory potential of their discussion. One of those strategies is "targeting gatekeepers' within a web of controls (actors with limited self-interest in rule-breaking, but on whom rule-breakers depend)" (Braithwaite & Drahos, 2000, p. 35).

Here then is an opportunity to increase the ethical standards of the world system of health in acknowledging in meaningful ways the contribution of Indigenous peoples. This is done by identifying the universities as key points in the regulatory chain of appropriation, providing analysis of the legal and policy processes that have created this condition, illuminating important ethical obligations that arise in identifying them as significant gatekeepers and offer innovative solutions of justice for Indigenous communities expressed in a way that clearly identifies how these are also powerful opportunities for universities to successfully rise above the crisis of academic capitalism.

While there has been a discourse suggesting that pharmaceutical companies no longer actively seek out IMK to develop drugs (Sampath, 2005), this assumption is partly based on the fact that nearly every major pharmaceutical company has shut down their ethnopharmacological projects and divisions in recent years. However, it would be deceptive to think this represented a halt in the appropriation of IMK. In my doctoral research, I found that the big biotech corporations now leave it to the medium sized companies and university based research institutions to do the coalface work with Indigenous communities and then step in when the discovery of bioactive compounds appear to warrant further development for economic gain. This is partly a cost saving exercise by the multi-nationals, but it is also an accountability strategy in removing any direct relationship with the communities. To all intensive purposes they can then say, "Hey, all I did was buy the patent off the university, if you're worried about biopiracy, talk to the researchers who took it from the community in the first place". While the university will then refer to its ethics committee guidelines for justification in approving the project which meet the minimalist national ethical and legal standards, regardless of how inadequate they might be from the perspective of the Indigenous community concerned that just had its IMK effectively appropriated.

This aspect of the mystification of the origins of IMK is not just enhanced by pharmaceutical companies being able to deceptively claim they have shut down their research divisions associated with such research. It is further obscured by the fact that most IMK research done is not through direct contact with Indigenous communities. 80% of IMK appropriation occurs

through the screening of literature and databases (Kate & Laird, 1999). Databases of research largely collected through the work of postgraduate students under the mentorship of university lecturers.

> This fact has significant implications for benefit-sharing, and suggests that academic publications and transmission of knowledge into databases— rather than field collections on behalf of companies— are the most common route by which traditional knowledge travels from a community to the commercial laboratory. Companies therefore have access to knowledge in ways that do not trigger benefit-sharing (Kate & Laird, 1999, p. 62).

A realisation of this gradually occurred in my doctoral research as I found that my own university (Macquarie) had active bioprospecting programs focusing on IMK involving a number of differing departments. Upon organising an international conference in my university (Indigenous Knowledge & Bioprospecting, April, 2004) and in further research, I found that nearly every major university in Australia also had such research programs. I then found in examining patents and related literature that nearly every medicine dependent on IMK for its origins had a university involved in its initial identification and development and who then formed partnerships with pharmaceutical companies. This includes the the Smokebush (Genus Conosperum) of the Noonygah people and associated HIV fighting related compound Conocurovone. Development of that drug was ceased by Amrad, but then shifted to the US National Cancer Institute in partnership with the Department of Biological, Chemical and Physical Sciences, Illinois Institute of Technology, the Life Sciences Operation, IIT Research Institute, Chicago, and the Department of Chemistry, University of Illinois at Chicago (Stagliano et al., 2006). Another example includes the potential blockbuster painkiller being developed from the Barringtonia acutangula by Griffith University (Macarthur, 1989; Skatssoon, 2004) in partnership with the Jarlmadangah Buru Aboriginal Corporation and an undisclosed pharmaceutical company that plan on entering into a benefit sharing agreement from the commercialisation of the medicine in 2008 (Kavelin, 2008). Other examples include the AIDS drug Prostratin from the Mamala tree of Samoa developed through University of California, Berkley, and the eventual patent reversal on the healing properties of Turmeric by The University of Mississippi Medical Centre among many other examples.

From the perspective of the Indigenous community, like the Ojibwa and Essiac, how are they to know their knowledge was appropriated? In a hypothetical, but not improbable story, an Indigenous community may have met a post-graduate student 20 years ago that spent years living with them. He may have been a truly caring, trustworthy and honourable person who received his own skin name during his years living with and researching the community for his PhD. However, somewhere in his thesis he spoke of a hepatitis treatment and the several plants he observed one of the healers using. His intention in describing this powerful medicine was to justify the advanced nature of the knowledge of that community in order to help eliminate prejudice in his own Western culture. Yet 10 years later, another researcher from a medium sized biotech firm formed by a university is scanning anthropological databases wherein this postgraduate's thesis is located and is scanning for the word "hepatitis". He is not interested in the noble narrative surrounding that word. He is searching for "hepatitis" because it has been found that herbal antivirals that are effective in treating Hepatitis B sometimes show efficacy in inhibiting the HIV virus. He may then identify that this is the case here, patent the identified bioactive compound and sell the patent to a pharmaceutical company without even having read enough surrounding text to know which Indigenous people his knowledge came from. The pharmaceutical company then completes the clinical trials, renames the medicine and begins marketing it. An Indigenous person from that community may then contract AIDS, be prescribed this new antiviral treatment and never know that he was taking the very same medicine from the endangered plant he was spiritual custodian of. The very same plant which upon his return from the hospital he will walk past on the path in front of his very own home.

The following is an interesting example of how universities are gatekeepers as well as how medium sized biotech companies form out of their research and who then further contribute to the mystification of IMK process. From 2003 to 2004, the Rural Industries Research and Development Corporation (RIRDC) conducted a project "Developing a herbal medicine primary industry". This project was based at Queensland University of Technology. According to the RIRDC website, the objective of this project was:

> To develop and implement a strategy to advance medicinal herb production and processing and capitalise on commercial opportunities to advance the complimentary medicine industry as a significant export sector in a structured and systematic manner by 2007 (RIRDC, 2003, section titled, Developing a herbal medicine primary industry).

Towards the end of the project a company was established, Healing Power (CM) Ltd. and was listed on the stock exchange (ASX HPLU). One of the employees working within that company, and within Griffith University, advised in personal communication that the company folded in 2005 (Kavelin, 2008). The reasons for this were unable to be shared due to confidentiality agreements. She advises the company had relationships

with universities in China but not with the actual communities or individual traditional healers who were the origins of the knowledge. I queried the extent of their work on IMK and the reply was that "We didn't work directly with IMK, we only worked with proven remedies". I felt this was an interesting statement that indicated a cultural assumption that once a "primitive" Indigenous medicine had been legitimated by Western scientific research it then became advanced and could be declassified as IMK and reclassified as a "proven remedy". After her comment I then paused and said, "So once the IMK has been shown to be effective that's when you start working with it?" The reply was "yes". This highlights how the regulatory chain of drug development tends to obscure the relationships of dependency on the original Indigenous communities even by the time IMK makes it to the middle-sized biotech companies.

Although the start up company part of the project seems to have fallen through, individuals in the project were instrumental in raising awareness of a national herbal medicine primary industry. The primary researcher, Dr Phillip Cheras became the deputy director of the Australian Centre for Complementary Medicine Education & Research (ACCMER). The most recent significant development in this capacity building of a national system of herbal medicines occurred in June 2007 with the establishment of the National Institute of Complimentary Medicine (NICM) which is hosted within the University of Western Sydney. The NICM has started with funding of about $4.6 million:

> The NICM initiative complements the announcement in late 2006 of $5 million in National Health and Medical Research Council Special Initiative Research Grants for complementary medicine and the inclusion of complementary medicine in the new National Health and Medical Research Council (NHMRC) triennial strategic plan. The special initiative funding has drawn an overwhelming response with 141 applications from 37 institutions demonstrating the high level of interest in complementary medicine research (NICM, 2007, para. 2, Background page).

The mandate of developing a national complimentary medicine industry is broad and requires many different types of development pathways. The development of an integrated national herbal medicine system is one of those pathways. The NICM strategy to accomplish this is to give seed funding to a variety of institutions, many of them likely to be within or associated with universities, to encourage research and networking in the various areas necessary:

> To build the capacity of complementary medicine research across Australia, effectively connecting complementary medicine researchers and professionals with the broader research community, industry and other stakeholders, to provide strategic focus and foster excellence in research ... which provides positive benefits to the health of Australians through evidence based research in complementary medicine and integrated healthcare delivery (NICM, 2007, paras. 1 & 2).

One of the features of this process clearly involves the utilisation of IMK. The interim director of NICM Professor Alan Benoussan advised in an article by Cresswell that:

> There are indigenous medicines available all around the world, and what we need to do is look at some of the claims around these medicines, so we can see how they might be incorporated into conventional healthcare (Cresswell, 2007, para. 13)

Upon speaking with NICM's administrative officer, it was advised that their protocols for research are still in development, so it is premature to analyse where on the ethical continuum of the IP of IMK they will be and whether a model that indirectly results in a process of denial of dependency and mystification will occur. It appears likely that without consciousness of the subtle qualities of this process and unless an informed discourse occurs, the current system the institution is embedded in will likely cause this appropriation, denial and mystification by default. This equally applies to universities themselves and strengthens the need to consciously explore how universities are gatekeepers, how they became that way and what can be done in response to that consciousness.

Universities are gatekeepers in at least two fundamental ways important to the discussion of this paper. Firstly, they are arguably the most significant link in a chain of regulatory actors in the intellectual gate-keeping processes. Universities are the primary institutional location through which flows the medical knowledge of Indigenous communities to the transnational corporations who eventually appropriate that knowledge and transform it into commercially valuable products. The second gatekeeping function relates to the filtering mechanisms in universities that determine the relevance and value of cultural models of epistemology; in this case the spiritual aspects of IMK. Essentially universities largely act as the social centres of the legitimation of particular types of knowledge systems. In the current university system, the spiritual aspects of the IP of IMK can largely only find token forms of engagement.

Dr. Sandra Eades, among the first graduating class in 1990 of Aboriginal medical doctors in Australia conducted a workshop in 2003 for the Macquarie University Human Research Ethics Committee (I served on the University Human Research Ethics Committee as representative Baha'i chaplain from 2002-2005). The workshop was about her work in consulting with Aboriginal peoples to assist in the drafting of a new set of Indigenous

guidelines for the National Health and Medical Research Committee. She commented that Aboriginal elders she consulted with made an interesting point about the protection of Indigenous knowledge. She indicated that the elders consulted felt that there was a Western preoccupation and overemphasis on legal and ethical protection of knowledge. They said they wanted to see a shift towards learning to value Indigenous beliefs and wisdom and letting that deeper respect transform the Western ways of knowing and research. It was not that protection is not important, but they said that it must start first with this deeper level of valuing Indigenous culture and that this would eventually lead to a more authentic form of protection.

It is important to take seriously elders advice that Western culture is preoccupied with protection and should be focused on valuing the wisdom of the culture it is trying to protect. What we value we protect. Therefore commercialised IMK is wrapped densely in a cocoon of numerous laws and government policies to protect its ownership by corporate interests. Yet we face a period of unprecedented extinction of the diversity of languages, cultures, and species which produced the IMK in the first place. We value the commercial elements but we do not value the people or their differing spiritual epistemologies or the land, ancestors and spiritual realm. This deficiency enables a denial of dependency on a deeper level. We are dependent not just on their medicine but upon their epistemologies which have sustained biocultural diversity upon which our survival depends. Being able to honor these epistemologies is no easy task, as it requires Western culture and law to come to terms with how our own epistemologies suffered unnecessary fracturing of the spiritual and material in our own traumatic histories. However difficult this task may prove to be, it is invaluable, as it will enable the ability of humanity to honor the intrinsic value and gifts of each other's diverse cultures. One of the challenges to honoring the wisdom of these elders is the shortsightedness caused by the preoccupation with protection of knowledge in the academic discourse. This is trapping the Western mind within a box or paradigm of assumptions and preventing "thinking outside the square" necessary to transform the valuing system itself.

On the international level this is most clearly manifested in discussions surrounding articles in the Convention on Biological Diversity (e.g. Articles 8j and 10c) that encourage benefit sharing with Indigenous peoples. Arising out of that two decades of international focus are principles such as prior informed consent, mutually agreed terms and disclosure of origin when registering intellectual property. While these principles are positive in a relative sense, I suggest that it is unlikely that even the most universal adoption of these principles will result in true justice and cultural equality. I believe these attempts to modify the current system are like trying to use technical and bureaucratic methods to manage a slower collapse of civilisation rather than creating a new paradigm that addresses the causes of the biocultural extinction in the first place. Under the proposed model, the technical reality of benefit sharing, when applied to IMK results in a best practice model of about 2% profits going to an Indigenous community. (This is only when there is direct research with a community, remembering that 80% of appropriation occurs otherwise and does not generally trigger benefit sharing, particularly if the database was created pre-CBD). Briefly, the way it works is that a university researcher works with a community, after having promised half of any profits received from commercialisation of IMK. He then identifies and demonstrates the bioactivity of a compound found in a form of IMK. He then patents it for the university and continues research to determine efficacy and toxicity levels. If the initial clinical trials are passed, an industry partner or pharmaceutical company in this case, is invited to purchase the patent to complete the more expensive stages of the clinical trials which the university and/or medium sized biotech company they work with cannot afford to do. The pharmaceutical company (almost always US or European owned) will then offer the university on average 4% of any potential profits if the medicine is successfully commercialised. The university then shares half of that with the community, or roughly 2% (Kavelin, 2008; Soejarto et al., 2002). There are a number of other levels of benefit sharing on the ethical continuum, and I identified at least six in my doctorate, ranging from outright theft all the way to Indigenous owned but this 2% is the most likely outcome according to best practice in the current model. How is this equality? Stepping back from the complex layers of stakeholders and the appropriation process the end result is that 2% go to members of Indigenous culture and 98% of the profits go to members of the dominant culture (even if this percentage is a composite of several different institutions). Under this model, on a long-term basis, equality is a guaranteed impossibility.

Many generations of Indigenous scientists over hundreds and thousands of years worked on developing a sophisticated medical knowledge including the epidemiology of local diseases, their effects upon human homeostasis, knowledge of the plants which restore these balances, complex preparation methods of the plants, relation to other medicines including side-effects and contraindications, awareness of its spiritual ontology and the nature of the epistemology underlying the development of the medicine over generations. There was a technological indwelling of the natural and spiritual world in a way difficult for Western practitioners to understand, even though they equally indwell their own medical technology (Kavelin, 2008; Posey, 2002). Just as an ordinary member of Western society may benefit from advanced technology his culture has created and knows which buttons to push, and in which contexts to use it in and how to maintain it on a minimal level of replacing batteries,

it does not mean that he understands personally the science and technological philosophy that created it. There are specialised holders of knowledge in the culture responsible for maintaining the technology and there are those who specialise in continuing the innovation of its development. The same is true for Indigenous culture and medical technology. Ignorance of these specialised roles of knowledge means that Westerners assume such unarticulated sophistication proves the knowledge a superstition of accidental discovery. Does the fact that almost every Western person could not tell you how the simplest of medicines works or where it came from or how to make it mean their knowledge is a superstition? This is also symptomatic of ignoring the consequences of colonisation upon Indigenous knowledge systems and their sustainability.

One of the most central arguments in IP law is that the connection between a persons' labour and the development of the property entitles them to ownership (Drahos, 1996). The mystification of Indigenous knowledge and labour, which Western universities are largely responsible for perpetuating, allows for courts to determine that a pharmaceutical company is sufficiently justified in owning a patent on IMK after 10 years of research and financial investment. This clearly is a prejudicial and radical reversal of both the proportion of labour and innovation behind the creation of the medicine. However, the superficial treatment of Indigenous knowledge as largely a performative art (rather than such art being recognised as complex signifiers meant to be the tip that identifies the iceberg beneath ... and the ocean that connects all the other icebergs together) allows this to happen. This superficial treatment is largely a consequence of the inability of the Western mind to appreciate integrated and holistic epistemologies that include appreciations of a spiritual dimension.

This inability to honor the gifts of Indigenous knowledge is a form of "epistemic ignorance" of the university (Kuokkanen, 2007) and has dire and significant consequences on a number of levels that should be of great concern to all those within it. In recent decades all Western universities have gone through a process that has strengthened the university gatekeeping role of appropriation. This same process has also entrenched the epistemic ignorance underlying the mystification of Indigenous knowledge and labour responsible for IMK. This process is sometimes referred to as "academic capitalism". Slaughter and Leslie (1997) in perhaps the most widely acclaimed study on academic capitalism suggest four important effects on higher education in their study of Australia, Canada, the UK and the USA. The four implications are:

1. the "constricting of moneys available for discretionary activities such as post-secondary education".
2. "the growing centrality of technoscience and fields closely involved with markets, particularly international markets".
3. "the tightening relationships between multinational corporations and state agencies concerned with product development and innovation"
4. an "increased focus of multinationals and established industrial countries on global intellectual property strategies" (Slaughter & Leslie, 1997, pp. 36-37).

These trends are reinforcing the pattern of universities facilitating industry partnerships and commercially profitable research. This has had disturbing effects on the traditionally more disinterested research positions of the university, as they now must increasingly rely upon corporations and "industry partnerships" for the majority of university funding. The price of this is that the university then becomes the research and development division of these corporations. This directly affects the focus of education upon more technical training skills and affects the way textbooks are written and what research is undertaken. Academics are increasingly expressing dissatisfaction and it is impairing the capacity for the independent investigation of truth, creative freedom and ability to develop research that serves the needs of humanity rather than corporations. It affects the way the university relates to IMK by instinctually perceiving it as an opportunity for attracting industry partnerships, rather than more noble but less profitable possibilities.

Prior to 1981 almost all publicly funded technology and medical research arising out of a university would be owned by the government or released into the public domain through publication. 1981 is symbolic as a historical marker for two important reasons. Firstly and most importantly, this is when the Bayh-Dole Act went into effect in the US and gradually found similar manifestations in other developed countries like Australia. This act allowed universities and small businesses to own patents in inventions that they had developed with federal funds (Drahos & Braithwaite 2002, p. 163). This has partly been a strategic act of governments to allow them to justify the dramatic reductions in funding of universities:

> A fact often overlooked in discussions about the funding of Australia's universities is just how "commercial" they now are compared to twenty five years ago ... in 1981 Australian universities received almost 90 per cent of their income from government sources, yet by 2003 this figure had declined to less than 43 per cent (Go8, 2005, p. 1).

Along with passing laws allowing universities to make money from their own research, governments have created tax laws and policy that intentionally encourages industries to fill the void in supporting universities by reducing how much tax they pay on

research done with universities. Universities then find themselves contemplating how to respond to the reductions of Federal funding and the conditions created by the government lead them to realise the inevitability that specialising in research that attracts corporate investment in universities is the best and possibly only remaining option.

Secondly, in 1980 the Diamond vs. Chakrabarty case (447 U.S. 303 (1980)) opened the door for biotechnology patents to expand to include "anything under the sun that is made by man", including living organisms produced using genetic technology. The case involved a genetic engineer who invented a bacterium able to break down crude oil, and theoretically clean up oil spills. He applied for a patent for the bacterium in the United States but the patent examiner rejected his application on the basis that the law dictated that living things were not patentable. He appealed and eventually the United States Court of Customs and Patent Appeals overturned the case and indicated that a microorganism being alive was of no legal significance or consequence to patent law. Universities and corporations then recognised the opportunity this relaxation of patent law afforded in commercially benefitting from biotechnology and increased their research focus in this area. Increasingly since this period there has been a rush to commercialise research in universities as well as a transfer process of biotechnology from the public sphere to being "locked up" in the private sphere (Stevens & Bagby, 2001) and this has had a consequence on the kind of research in medicine that is engaged.

For example, although funds spent on global research and development of pharmaceutical drugs has more than tripled since 1986 (from US$30 Billion in 1986 to 150.9 Billion in 2006), 90% of this money is spent on the health problems of less than 10% of the world's population (Anne Burke & de Francisco, 2006). This "90/10" equation has remained relatively constant in that 20 years regardless of the dramatic increase in funding levels overall. An analysis of the 1,035 new drugs approved by the US Federal Drug Administration between 1989 and 2000 demonstrated that "less than 1% addressed diseases that primarily afflict the poor and for which new treatments would have the greatest effect on world healthcare" (MSF, 2006, p. 2). We live in an age where we have set aside funds to produce and patent medicines that treat separation anxiety in dogs (Horwitz, 2000) yet have not set aside funds to research or produce any medicine to treat the fatal disease of sleeping sickness which 60 million people in developing countries are at risk of contracting (MSF, 2006).

Returning more specifically to the process of academic capitalism described earlier, this has arguably manifested in a more general impairment of the democratic function of universities (Readings, 1996). University administrative culture in Australia has undergone significant changes since 1988, including reductions in government funding, decreasing job security, a relative decline in salaries, more constricting government control over teaching and research budgets, the expansion of managerial authority at the expense of academic collegiality (Encel, 2000), as well as the already discussed growth of "marketing" activities by universities in an attempt to gain more finance.

This has reduced the capacity of universities to act as a space where differing cultural epistemologies can be valued. This arguably has had an inverse effect upon reducing the innovative and creative capacities of the university (Delanty, 2001) on a cultural level of exchange. This is due to the administrative culture exclusively focusing on research or knowledge which can produce funding. In this space Indigenous modes of knowledge that include a focus on spiritual and material integration have less resonance, and thus the crisis of "epistemic ignorance" is entrenched. Additionally, it should be considered that any knowledge which may critique or jeopardise their corporate relationships might be viewed with hostility. These processes of academic capitalism are reflected on a practical level of university policy in Australia. Universities are no longer just affected by government policy encouraging these trends; they are encouraging and creating the conditions themselves.

A recent report by Macquarie University "The innovative university" highlights their central priorities which reflect the significant findings of Slaughter & Leslie (1997) as can be seen from this mission statement of Macquarie taken from their website:

With regards to community engagement, and particularly commercialisation of research, as an example at Macquarie University over the last five years the University has (see Macquarie University, 2006, p. 1):

- Established the Macquarie Institute of Innovation – committed to providing education in innovation and entrepreneurship to produce graduates and staff with skills and insights needed to launch new ventures, lead the development of new economically significant enterprises, and drive transformational change.
- Established an Office of Business Development (OBD) charged (in cooperation with the Office of the Deputy Vice-Chancellor (Research) (DVCR) and the University's Research Company, Access MQ), with the protection of the University's intellectual property, and, where appropriate, its commercialisation
- Revised its Institutional Intellectual Property Policy
- Established new processes for attracting and evaluating Invention Disclosures fro staff and students by way of a working group (the Intellectual Property and Commercialisation Management Committee – made up of members from OBD, DVCR and Access MQ) which meets fortnightly. This group monitors all activities from invention disclosure to eventual sale/licensing/spin-off

- Established an Awards Night – where University staff and students receive awards in acknowledgement of outstanding achievements in the invention/ commercialisation process. This is designed to change the university culture so as to publicly value commercialisation as an academic activity
- Promoted research interaction with local government and industry
- Established an R&D Park on campus, including incubator facilities

One of the consequences of the shift towards academic capitalism in the past 20 years has been a proliferation of technology company "spinoffs" from universities. A spin off is when a staff or student decides to commercially exploit their invention by forming a new company, often in partnership with the university and other corporate industry partners. For example, Cryptopharma is a biotech spinoff company from Melbourne University that formed when Dr Alastair Stewart, an Associate Professor in the University of Melbourne's Department of Pharmacology developed new drugs to treat respiratory diseases and found industry partners willing to invest in forming the company with the university. The sector with the greatest amount of spinoffs has been biotech and pharmaceutical companies. An examination of the data (Smith & Glasson, 2005) of spinoffs from three universities in the UK demonstrates that there is a clear spike in biotech spinoffs from 1996 onwards to 2005 with 40% of 114 technology based spin-off companies being specifically in the biotech and pharmaceutical company sector. Interestingly, nearly every biotech company formed is eventually acquired or merged with a foreign company (Smith & Glasson, 2005).

These trends are reflected in most developed countries including Australia. As of 2006 there were over 420 biotech companies in Australia (AusBiotech, 2007). As of 2005 human therapeutics made up the majority of these companies, while the major source of the technologies that support this industry are Australian universities, medical research institutes and government laboratories (Coulepis, 2005). These trends in law and policy reflected in the government, corporate and university systems clearly indicates that any IMK encountered by researchers or students is very likely to be seen as an opportunity to commercialise it and explain why universities have become such significant gatekeepers in the chain of actors from community to transnational pharmaceutical company.

It is also important to appreciate the IP policies of universities as they relate to Indigenous peoples. Most universities have IP policies which are geared towards encouraging commercialisation and protecting the ownership of IP by the university. Additionally most universities have special clauses within that context that mention special considerations in relation to Indigenous knowledge. For example the University of Queensland's IP policy clause in relation to Indigenous peoples reads:

8. Indigenous Cultural and Intellectual Property Rights.

8.1 "Indigenous Cultural and Intellectual Property Rights" refers to Indigenous Australians' rights to their heritage, and consists of the intangible and tangible aspects of the whole body of cultural practices, resources and knowledge systems developed, nurtured and refined by Indigenous people and passed on by them as part of expressing their cultural identity.

8.2 The heritage of Indigenous people is a living one and includes items that may be created in the future, based on that heritage. Indigenous Cultural and IP Rights are increasingly being recognised internationally through treaties and standard setting developments by the United Nations and its agencies. The University recognises and *will protect Indigenous Cultural and IP Rights to the fullest extent permitted by Australian law*. (emphasis added) (University of Queensland, 2004, section 8).

While the law can be skillfully used to offer some types of protection, even this is limited and insufficient by most Indigenous standards. However, more importantly, the law *in itself* does not look after the interests of Indigenous owners of IMK. It is a tool that can be used to make knowledge commercially viable by ensuring that the proprietary rights of whoever registers it first is protected. Additionally, the tools of intellectual property law, tax law, trade law and other areas are being intentionally adapted by governments to give specific advantage to corporations in order to stimulate national investment and economic growth. For example, increasing the range of patentable inventions, weakening the requirements for patents in ways that favour technical skills, extending their duration, enforcing these through free trade agreements that benefit the exporting developed countries, reducing the taxes corporations have to pay to work to move into the country and further subsidising if the growth of the company is categorised as educational research. In a world where the corporations are the ones with the legal resources vs. Indigenous communities with nothing, the intellectual property policy of the university becomes a tool to serve their appropriative capacity rather than an active mechanism of protection for Indigenous people. With universities increasingly becoming not only partners with corporations and pharmaceutical companies, and in fact becoming corporate in structure themselves, the reassurance of "fullest extent permitted by Australian law" becomes almost a threatening phrase. These gatekeeping functions of appropriation combined with the epistemic ignorance of the university greatly impairs the ability of the university to honor the indigenous customary laws of the Indigenous

communities their researchers are working with. If we can learn to find meaningful ways to respond to these contexts that empower the honouring of the diversity of Indigenous customary law, I suggest it would benefit all cultures in improving the worlds health system.

In recent decades, there has been uproar about the fact that the Western model of IP combined with health systems based on profit created a model that meant some drugs were more expensive in African countries than in developed countries. This was because of marketing principles which meant it made more economic sense to have a smaller market that appealed to the elite rich in such countries. This model meant the drug was even more expensive in these poorer nations than in the United States or other developed nations (Drahos & Braithwaite, 2002). While this situation has changed somewhat after intense public scrutiny by NGO's and other developing countries it highlights the Western health system does not naturally look after the interests of the poor and destitute.

While the prostratin case of benefit sharing between Samoa and the University of California Berkley may not be ideal in an absolute sense, it is fairly high in the continuum of ethical examples available in the world. However, that is not what is being debated here. What illuminates the future is that one particular feature of Indigenous customary law stands out: "prostratin is Samoa's gift to the world", explained Samoan Minister of Trade Joseph Keil (Sanders, 2004, para. 3). Samoa asked that if the AIDS drug is successfully developed that whatever pharmaceutical company ends up developing it must promise to distribute the drug at low or no cost to developing countries suffering from the AIDS epidemic (WIPO, 2001).

This concern for the suffering of those who are unable to acquire their own medicine arises, not as a random act of kindness, but as a fundamental feature of most forms of Indigenous customary law in seeing all as relations and the nature of medicine as a sacred gift. If the freedom to apply such principles was granted to Indigenous peoples in the process of repatriation, in developing their own pharmaceutical companies, or through other approaches that effectively empowered Indigenous customary law, the world would be illuminated with a new economy of health as gift giving that honors our fiduciary obligations to our ancestors to ensure the health of all. Unless we address the gate keeping roles of universities there can be no trustworthiness in the relationships which is necessary for this future to become possible.

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