



Deposited via The University of Leeds.

White Rose Research Online URL for this paper:

<https://eprints.whiterose.ac.uk/id/eprint/123051/>

Version: Accepted Version

Article:

Dutfield, G (2017) TK unlimited: The emerging but incoherent international law of traditional knowledge protection. *Journal of World Intellectual Property*, 20 (5-6). pp. 144-159. ISSN: 1422-2213

<https://doi.org/10.1111/jwip.12085>

© 2017 The Authors. The *Journal of World Intellectual Property* © 2017 John Wiley & Sons Ltd. This is the peer reviewed version of the following article: Dutfield G. (2017) TK unlimited: The emerging but incoherent international law of traditional knowledge protection. *J World Intellect Prop.* 20:144–159, which has been published in final form at <https://doi.org/10.1111/jwip.12085>. This article may be used for non-commercial purposes in accordance with Wiley Terms and Conditions for Self-Archiving. Uploaded in accordance with the publisher's self-archiving policy.

Reuse

Items deposited in White Rose Research Online are protected by copyright, with all rights reserved unless indicated otherwise. They may be downloaded and/or printed for private study, or other acts as permitted by national copyright laws. The publisher or other rights holders may allow further reproduction and re-use of the full text version. This is indicated by the licence information on the White Rose Research Online record for the item.

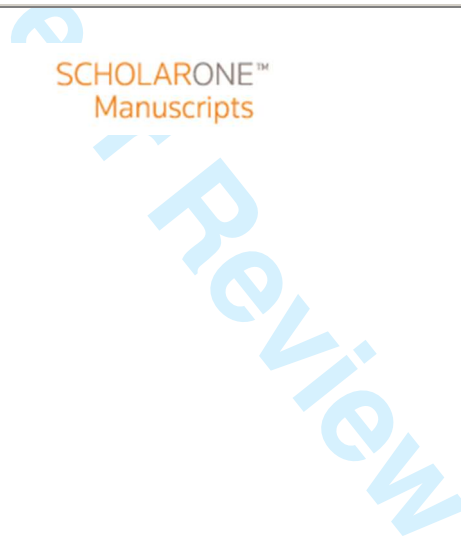
Takedown

If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.



TK Unlimited: The Emerging but Incoherent International Law of Traditional Knowledge Protection

Journal:	<i>The Journal of World Intellectual Property</i>
Manuscript ID	JWIP-03-2017-0051.R2
Manuscript Type:	Original Article
Keywords:	traditional knowledge < Key Topics, intellectual property < Key Topics, Convention on Biological Diversity < Organizations and Agreements



TK Unlimited:**The Emerging but Incoherent International Law of Traditional Knowledge Protection**

ABSTRACT

There is an emerging international regime complex concerning traditional knowledge (TK). Debate continues on what form strong legal protection should take including how benefits from commercial use ought to be shared and what form positive protection might take. This article considers how far progress is feasible. It makes three related claims. First, there is a persistent tendency, impliedly at least, to position 'tradition' in direct opposition to 'modern'. We show how this is ahistorical and causes misconceptions regarding the nature of TK, and its relationship to other knowledge systems. It also tends to discourage possibilities for mutually advantageous collaborations based on respect for local norms regulating access, control and ownership. The second claim is that many TK advocates, by misconceiving it, are too expansive in what they demand the proposed international regimes accommodate. This appears to preclude possibilities for policy coherence. The third is that the access and benefit sharing measures envisaged by the Convention on Biological Diversity tend to disregard the value of TK for holders and their communities themselves, which is often non-economic. This matters because of its significance to local people's lives, which is likely to outweigh the value arising from its translation into biotechnological knowledge inputs.

INTRODUCTION

International negotiations concerning the design of legal instruments protecting holders of traditional knowledge (TK) from 'the scourge of biopiracy' (Mgbeoji, 2001) have focused in

1
2
3 recent years on three forums and two attached legal instruments. These are the United
4 Nations World Intellectual Property Organization (WIPO), the World Trade Organization
5 (WTO), the Conference of the Parties to the Convention on Biological Diversity (CBD), the
6 latter Convention itself and its Nagoya Protocol to the CBD. Further instruments may
7 follow.¹ The movement, which is formally led by the relevant international organizations and
8 their membership but influenced by various non-governmental organizations and business
9 associations, has encountered various differences of opinion including, for example, how
10 intellectual property-like should a positive protection regime for traditional knowledge be.²
11 There is also a serious conceptual challenge which negotiators have failed to resolve despite
12 so many years of debate.³ Insofar as some degree of international consensus is considered
13 essential to deal with misappropriation or misuse, the continued absence of workable
14 parameters or clear definitions around 'traditional knowledge' is obstacle to any real
15 international-level progress. Traditional knowledge unlimited for many advocates embraces
16 all 'traditional knowledge' including those vast amounts that have become completely
17 unmoored from any specific place, country (or even continent) they may have originally
18 come from and which may in essence have become mixed and hybridised. Can we achieve
19 international protection of traditional knowledge as long as it is construed so broadly that
20 anything that *could* be traditional *is* traditional and equally worthy of legal protection and
21 benefit sharing rights? This is very important. There is a world of difference between
22 turmeric drinks with added milk that have no specifically local source (Biswas, n.d.), and
23 something as apparently specific in origin as the use of an extract of the bark of the tiki uba
24 tree as an arrow poison by the Urueu-Wau-Wau, comprising just a few hundred people in the
25 Amazon (Posey, Dutfield and Plenderleith, 1995). Traditional knowledge means different
26 things to different people, but even if it meant the same thing to different people, is it realistic
27 to suppose it can form a bounded and coherent broad category of knowledge for the purpose
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 of assigning legal rights and duties on the basis of its use by third parties? Little attention has
4
5 been paid in the literature to this question yet it is crucially important.
6
7

8
9
10 Admittedly, these definitional and conceptual challenges have not gone completely
11 unrecognized. Nor are we strangers any more to the notion that tradition (and TK itself) can
12 be ‘invented’ (Hobsbawm and Ranger, 1983; Sunder, 2006). It was precisely because
13 ‘traditional knowledge had different meanings for different people in different fora’ that in
14 2010 the WIPO Intergovernmental Committee on Intellectual Property and Genetic
15 Resources, Traditional Knowledge and Folklore was requested to prepare a technical report
16 on ‘the various forms in which traditional knowledge may be found’ (WIPO, 2010).⁴ The
17 document focuses largely on the practical forms of traditional knowledge: know-how, skills,
18 innovations, etc. Lumping together the documented ‘grassroots innovations’ (Gupta, 2016)
19 often from individuals or small groups with the largely anonymous collective ones of
20 indigenous peoples *and* without excluding also the practical general knowledge of vast
21 numbers of rural inhabitants in one or more country is useful with some essential and correct
22 distinctions made. It fully accepts that traditional knowledge changes and evolves generation
23 by generation rather than stays the same. It distinguishes between traditional knowledge *as*
24 *such* and traditional knowledge-based innovations and creations acknowledging that drawing
25 lines between them can be very difficult. The report has nothing to say about the legal
26 implications arising from those essential and correct distinctions. It does not really explore
27 the implications of the mixing and remixing of knowledge so that knowledge may only be
28 partially ‘traditional’ or ‘modern’ and that this could potentially be true for most so-called
29 traditional knowledge in the world as it could be also for non-traditional knowledge. Nor
30 does it fully consider the difficulties in assigning origin and attribution which again might be
31 applicable to most of the world’s traditional knowledge.
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4
5 In 2010, the Nagoya Protocol to the Convention on Biological Diversity (CBD) was adopted.
6
7 It has now entered into force. The Protocol, whose full name is the Nagoya Protocol on
8
9 Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from
10
11 their Utilization, seeks to further the third objective of the CBD: the fair and equitable benefit
12
13 sharing arising from the use of genetic resources including associated traditional knowledge
14
15 (Greiber et al., 2012; UNCTAD, 2014). To date government regulations on access to genetic
16
17 resources and benefit sharing (typically abbreviated to ‘ABS’) and the use of legal
18
19 agreements such as contracts are deemed the appropriate and effective means by which
20
21 biodiversity and the undefined ‘associated traditional knowledge’ may be transferred
22
23 internationally to commercial actors under principles of fairness and equity (Carrizosa et al.,
24
25 2004). The latter use intellectual property law to acquire legal monopolies enabling an
26
27 income stream that can then be shared, at least in theory. The Philippines and the Andean
28
29 Community of South American nations pioneered genetic resource access and benefit sharing
30
31 regulatory structures in the mid-late 1990s. Peru has two statutory instruments on traditional
32
33 knowledge protection.⁵ Many more countries have since followed their example.
34
35
36
37
38
39
40

41 The purpose of this article is to investigate the TK concept. We will critically assess
42
43 conventional usage of the term, including the prevalent assumptions as to how ‘tradition’
44
45 relates to ‘modern’. We will also consider its value. Who uses TK? And who *needs* TK? The
46
47 original contribution of this article is to apply history to the analysis rather than relying on
48
49 law alone. We will relate this analysis to present-day debates on international TK protection.
50
51 The discussion aims to show whether we may be misunderstanding TK. Can TK be better
52
53 operationalized legally through a better targeted application of the term than the currently
54
55
56
57
58
59
60

1
2
3 somewhat vague and contradictory understandings of the term allow? This is a question we
4
5 seek answers to.
6
7

8
9
10 The article makes three related claims. First, there has been a strong and persistent tendency,
11
12 impliedly at least, to position 'tradition' in direct opposition to 'modern'. We argue that this
13
14 is ahistorical and causes misconceptions regarding the nature of TK, its relationship to other
15
16 knowledge systems, and how far it may be subject to local norms regulating access, control
17
18 and ownership. The second claim is that many advocates, including diplomats, negotiators
19
20 and activists, whether by design or default, are too expansive in what they demand the
21
22 proposed international regimes should accommodate to the detriment of legal and policy
23
24 coherence. The third is that the access and benefit sharing measures envisaged by the
25
26 Convention on Biological Diversity and the Nagoya Protocol tend to disregard the value of
27
28 traditional knowledge for holders and their communities themselves, which is often non-
29
30 economic.
31
32

33
34
35
36 This critique is timely for three main reasons: first, the implementation of the Nagoya
37
38 Protocol is still in its early stages. Second, moves are afoot at WIPO to develop one or more
39
40 legal instruments on intellectual property and genetic resources, traditional knowledge and
41
42 traditional cultural expressions that would have a complementary relationship with Nagoya
43
44 Protocol-based regulations. The latest version of draft articles on traditional knowledge that
45
46 could form the basis for a legal instrument contains some very good language which would
47
48 have the effect of 'pinning down' traditional knowledge in a very constructive way. They do
49
50 address many of the concerns expressed in this article. However, all of the text is up for
51
52 continued negotiation and some of the best language falls within the square brackets that
53
54 mean it has a good chance of being deleted at some stage (WIPO 2016). Third, many
55
56
57
58
59
60

1
2
3 developing country members of the WTO have called for the rules on patents to be amended
4
5 requiring that applicants disclose their use of genetic resources and the contribution of the
6
7 associated traditional knowledge to the inventive achievement for which they seek patent
8
9 protection, and the origin of these elements (WTO 2004). No agreement has yet been
10
11 reached, and perhaps never will be, but it is quite possible that a WIPO instrument on
12
13 intellectual property and genetic resources will introduce this measure in some form or
14
15 another.
16
17

20 THE FALSE BINARY OPPOSITION OF TRADITION AND MODERNITY

21
22
23
24
25 Since the 1990s, the biopiracy discourse following established post Second World War
26
27 practice (see below) has tended to treat traditional and modern⁶ as binary opposites. Biopiracy
28
29 is (i) the theft, misappropriation of, or unfair free-riding on, genetic resources and/or
30
31 traditional knowledge through the patent system; and (ii) the unauthorized and
32
33 uncompensated collection for commercial ends of genetic resources and/or traditional
34
35 knowledge. Such unauthorised use and appropriation does happen though the chief offenders
36
37 are not in fact the big drug companies, as is commonly supposed, but much smaller firms
38
39 trading in various types of natural product such as foods, food supplements, herbal remedies
40
41 and seeds (Robinson 2010). These tend to have lower profit margins on their products,
42
43 though a change in their business practices could certainly provide some useful if modest
44
45 benefits for local communities (Robinson, 2015). The critique being made here is not with the
46
47 concept of biopiracy⁷ but with usage of the other two terms in the sentence opening this part
48
49 of the article including the relationship between them.
50
51
52
53
54
55
56
57
58
59
60

1
2
3 It is commonly supposed that tradition and modernity operate in separate spheres, except
4
5 where the modern incorporates tradition in a decontextualized fashion and then claims it as its
6
7 own. Such an opposition between tradition and modernity is a fundamental assumption of
8
9 post Second World War modernization theory. A number of mostly U.S.-based social
10
11 scientists in the Post War era identified fundamental social and cultural differences between
12
13 traditional and modern societies and assigned to each a set of descriptive terms that were in
14
15 opposition to each other. Accordingly, as they saw it, social and cultural evolution could be
16
17 best understood in terms of progress that would entail the replacement of terms applicable to
18
19 traditional societies such as 'community', 'patron-client relationship', 'routine', and
20
21 'solidarity', with their modern polar opposite counterparts: 'individual', 'bureaucratic
22
23 relationships', 'innovation' and 'competition' respectively. Since evidence of progress
24
25 essentially entailed the latter terms applying rather than the former ones, there was little
26
27 accommodation for hybridity including its positive aspects for both societies.
28
29
30
31

32
33
34 Two major criticisms, at least of the cruder versions of modernization theory, aside from its
35
36 ahistoricism, are its determinism and its failure to accommodate the idea of mixing and
37
38 hybridization and their potentially beneficial aspects also for the traditional sector. At its
39
40 crudest, modernization theory saw social progress and economic development as the
41
42 necessary transformation of traditional societies into modern ones. It is 'tradition' that was
43
44 holding societies back.
45
46
47
48

49
50 If the academic version of modernization theory went out of fashion decades ago, having
51
52 given way to dependency theory (now also largely discredited), some of its basic assumptions
53
54 have proved to be highly resilient. Examples include the overhyping of genetically modified
55
56 plants in developing countries, the dismissal of landraces and local cultivars as old varieties
57
58
59
60

1
2
3 that should be abandoned, and the blanket contempt for traditional medicine (Tallis, 2004).
4
5 Perhaps modernization theory's potentially most dangerous supposition is that *all* of what is
6
7 true for modernity becomes the opposite for tradition.⁸ This should immediately be cause for
8
9 reflection: that tradition has tended, and to a large extent still does tend, to be used negatively
10
11 as something outmoded. The word 'tradition' does not help here insofar as it implies some
12
13 kind of pure condition that is not adulterated with or diluted by elements from other societies
14
15 or transformed in any way endogenously. Seen in binary opposition, it follows that the more
16
17 tradition you have the more modernization you need; the less tradition the better. Over the
18
19 years some hard lessons were learned. For example, in the 1960s Balinese farmers forced to
20
21 plant Green Revolution modern high yielding varieties and purchase industrial chemical
22
23 inputs suffered diminished productivity and crop disease and pest outbreaks. However,
24
25 according to Lansing's classic study, when they returned to their own varieties and their
26
27 original management systems and practices of irrigation, fallowing and organic disease and
28
29 pest management based on a network of water temples that had been in place for centuries,
30
31 high productivity and sustainability recovered (Lansing, 2007).
32
33
34
35
36
37

38
39 The contraction of 'knowledge, innovations and practices' in Article 8(j) of the Convention
40
41 on Biological Diversity to just plain 'knowledge' in the Nagoya Protocol, albeit attached to
42
43 genetic resources using the phrase 'associated with', hardly helps. It tends to downplay the
44
45 creativity and adaptiveness of indigenous groups of each generation, as well as other societies
46
47 with tradition based bodies of knowledge that they wish to protect but that have changed
48
49 culturally and in other ways from the groups and societies they were in the past. Companies
50
51 pick up on this when their spokespeople say that traditional knowledge is old and is therefore
52
53 in the public domain. The public domain is generally a good thing (Boyle, 2008) but to
54
55 suggest everything placed in it *should* be in it goes too far when doing so violates people's
56
57
58
59
60

1
2
3 customary rules or cultural and spiritual values. The supposed beneficiaries of traditional
4
5 knowledge protection thus find themselves between a rock and a hard place. To the business
6
7 people, a moral obligation to share benefits with people whose knowledge is in the public
8
9 domain can (conveniently) only be limited at best, besides which the problem of biopiracy
10
11 has been grossly exaggerated and politicized. On the other hand, some powerful mainstream
12
13 developing world advocates, despite their ideological preferences towards 'local community'
14
15 empowerment, find themselves resorting to the view that support for communities can only
16
17 be furthered by according more regulatory powers in relation to genetic resources and
18
19 associated knowledge to governments, hence their tendency to strongly support national
20
21 access and benefit sharing regimes. This seems to embolden some governments to step in and
22
23 impliedly claim sovereign rights to traditional knowledge that is not easily attributable to
24
25 specific groups or communities.
26
27
28
29
30
31

32 The use, borrowing, appropriation, misappropriation, or whatever name one chooses to call
33
34 the inclusion of information, knowledge, methods and materials from one system of health or
35
36 agriculture into another different and more dominant system tends to be seen as being
37
38 unidirectional. As tradition wanes and modern waxes, people assume the latter takes bits of
39
40 tradition, used in the form of informational leads or raw materials, and gives nothing back in
41
42 return. Modern *appears* no less modern for doing this because there is a translation and
43
44 repackaging which generally strips tradition of its origins and cultural and spiritual
45
46 entanglements or else denies it entirely. Accordingly, modernity is parasitic on tradition. An
47
48 understanding of global power disparities reinforces such a perspective. It follows that the
49
50 way to respond is to create a market for knowledge transactions so that access is exchanged
51
52 for monetary or non-monetary forms to even things up. Enter the Nagoya Protocol.
53
54
55
56
57
58
59
60

1
2
3 Systems of knowledge tend to be hybrids because they are generally open, and they tend to
4
5 have two-way ‘valves’: knowledge, techniques, practices and materials go both out and in.
6
7 Chinese medicine, for example, was not ‘traditional’ until it was named as such a few
8
9 decades ago largely for political reasons. Traditional Chinese Medicine co-evolved with
10
11 western scientific medicine and has accommodated elements of modern science, for example
12
13 the germ theory of disease (see below). As for experiment and trying things out in a
14
15 systematic way it is not just white-coated laboratory scientists who do this; many traditional
16
17 healers and farmers, who often breed modern varieties with their own, do as well. Chinese
18
19 ‘traditional’ medicine remains highly popular as do the classical traditional Indian systems
20
21 such as Ayurveda, Siddha and Unani Tibb, not all of which originate – or are currently
22
23 practised – entirely in the subcontinent anyway. They may have very deep historical roots,
24
25 but they are hardly devoid of novelty or innovation. Isolated indigenous peoples in places like
26
27 the Amazon possess localized knowledge of flora and ecosystems enabling them to meet
28
29 many of their subsistence needs. But again it is unlikely that all of the biota they exploit or
30
31 the knowledge they apply are entirely local or have ever been. Although uncontacted groups
32
33 still exist in the Amazon, most human societies do not stay rooted to one spot over centuries
34
35 *and* over a substantial period turn their backs on the world outside their own little part of it.

36
37
38 Adaptability and openness are the main drivers of innovation. So might there be advantages
39
40 in no longer defining tradition as the polar opposite of modernity and instead seeing the two
41
42 as actually related to each other and capable of interacting positively? In reality they do and
43
44 have done from the age of Enlightenment if not before. That might sound counter-intuitive.
45
46
47
48
49
50
51
52 But if it happens to be true then we should go with it and follow it to its logical conclusions.
53
54
55
56
57
58
59
60

1
2
3 Most biopiracy incidences have nothing to do with the pharmaceutical industry. Nonetheless,
4
5 of all industries this one is considered by many to have gained more than any other from open
6
7 access to genetic material and associated knowledge from today's developing countries.
8
9 Indeed, one is tempted to agree with the critics that it has been parasitic on them pretty much
10
11 continuously since its emergence. At the same time, its claims to being wholly science-based
12
13 imply that it has never had such an intellectual or material dependency relationship. In fact,
14
15 the history of the pharmaceutical industry exemplifies the subtleties of cross-cultural material
16
17 and intellectual exchanges over time. It also raises questions as to the efficacy of adversarial
18
19 approaches which assume that there will always be exploitation unless strong international
20
21 rules are put in place. The transfer of genetic material and associated traditional knowledge is
22
23 not, and has never been, an *inherently* zero sum game, though admittedly one can identify
24
25 numerous individual cases where gains for some have been at the expense of others, usually
26
27 the weaker parties.
28
29
30
31
32
33

34 The modern pharmaceutical industry really took off around the 1880s when scientists began
35
36 to crack the problem of how to harness chemistry to other emerging scientific disciplines and
37
38 practices to solve hitherto intractable health problems on a regular and systematic basis.
39
40 Pharmaceutical products over the 150 or so years of the industry's existence have typically
41
42 been single molecules, usually small ones. They work by binding to certain proteins and
43
44 causing a change in their behaviour (Stockwell, 2011). Historically speaking, which type of
45
46 protein was bound to and why a therapeutic effect ensued was generally unknown, as were
47
48 the reasons why some people suffered from side-effects while others were unaffected. There
49
50 is still often much that is unknown concerning mode of action and the way drugs work
51
52 differently on different people.
53
54
55
56
57
58
59
60

1
2
3 Scientifically speaking, where did all this start? From about 1805 to the early 1830s,
4
5 numerous therapeutically significant alkaloids were isolated from plants. Among the most
6
7 important were morphine from opium (by Sertürner), emetine from ipecacuanha (by Pierre-
8
9 Joseph Pelletier and François Magendie), quinine from *Cinchona cordifolia* (by Pelletier and
10
11 Caventou), and codeine also from opium (by Robiquet). François Magendie's highly
12
13 influential work displays a clear understanding of the importance of obtaining a consistent
14
15 formulation and producing the right dosage, including of the fever-reducing cinchona
16
17 alkaloids which of course include quinine (Greene, 2014). To Pelletier has been attributed the
18
19 notion that purity has therapeutic value. Note that all of these natural products were used for
20
21 medicinal and other purposes by indigenous peoples and other non-European populations.
22
23
24
25
26

27
28 However extreme as the theoretical and epistemological differences might appear from this,
29
30 *there is no perfect traditional and modern divide marking out two quite separate worlds.* And
31
32 nor was there from the moment that Europeans began to ply the seven seas in search of new
33
34 lands, products and trading opportunities. One might assume that European colonials and
35
36 traders had nothing but disdain for local *materia medica*, but this was not necessarily the
37
38 case. From the early modern era, Europeans collected, documented, traded across the world
39
40 and imported into Europe medicinal plants from the East and the New World. Perhaps the
41
42 earliest example of a detailed treatise on medicinal plants imported into Europe from the
43
44 Western Hemisphere is Nicolás Monardes '*Historia medicinal de las cosas que se traen de*
45
46 *nuestras Indias Occidentales*' ('Medical study of the products imported from our West Indian
47
48 possessions'), published in the 1570s and translated shortly after into several European
49
50 languages.
51
52
53
54
55
56
57
58
59
60

1
2
3 The great international trading companies founded at the start of this age such as the Dutch
4
5 East India Company were instrumental in these botanic transfers (Cook, 2007). Late
6
7 eighteenth century introductions to the European pharmacopoeia coming from the New
8
9 World included Jesuit's bark (quinine) and ipecacuanha (Bynum, 1994). American plants
10
11 also reached Muslim regions and Portuguese possessions and trading posts in Asia, and in the
12
13 other direction westwards to the Philippines. Apart from trading companies, merchants and
14
15 Jesuits were also involved in moving these plants around the world. Other plants during the
16
17 age of European exploration and colonization came into Europe from Asia and Africa. These
18
19 included foods as well as drugs. Spices from the East not only flavoured otherwise tasteless
20
21 or disgusting food, but possessing humoral effects were included in the *materia medica*: 'The
22
23 history of spices is in part the prehistory of the pharmaceutical industry' (Arikha, 2007).
24
25 Global bioprospecting efforts provided a large proportion of the drugs available to Europe in
26
27 the later colonial era. Of the 175 plants in the 1885 British pharmacopoeia, 40 percent were
28
29 of European origin, 25 percent each were from Asia and the Americas, 9 percent were
30
31 African, and 1 percent was from Australia (Osseo-Asare, 2008).
32
33
34
35
36
37

38 What was the attraction of these plants coming from distant lands? It is frequently claimed
39
40 that their exotic origins and names, as well as the colourful stories concerning their sources,
41
42 the local uses of them, and the means by which they were 'discovered' by Europeans gave
43
44 them much of their appeal. According to one recent historical work, their uses by native
45
46 populations was likely to have been a factor in their popularity during the late seventeenth
47
48 century (Gänger, 2015).
49
50
51
52
53

54 On the other hand, some fitted neatly into existing *materia medica* and treatment practices
55
56 because in certain senses they were *not* exotic. Their use may have been compatible with
57
58
59
60

1
2
3 humoral approaches to sickness and health, or else they were related biologically to already
4 known plants. In some cases, as trade expanded and populations moved on a greater scale, so
5 did disease. A treatment used for a disease in one part of the world was perhaps presumed
6 often to work for the same affliction, or similar symptoms, in very distant places.
7
8
9

10
11
12
13
14 In addition to material, recipes in the form of written texts also crossed seas and continents,
15 and not in one direction only. From Europe to China and the Islamic world between them,
16 medical recipes were of two kinds: formulas and prescriptions. How are these different? ‘The
17 formula contains the standard way of preparing a medication – that is, its recipe as laid down
18 by an authoritative text. The prescription, in contrast, is a medication for an actual patient,
19 usually contained within a practitioner’s case records’ (Hanson and Pomata, 2017). From the
20 seventeenth century, Jesuits translated medical texts from Chinese into Latin and French and
21 vice versa. In 1693, quinine provided by Jesuits was used to treat the emperor of China
22 (Ibid.).
23
24
25
26
27
28
29
30
31
32
33
34
35

36 Medical historian Abena Osseo-Asare makes an intriguing connection between high
37 colonialism and modern pharmaceutical development, one that is worth closer inspection:
38 ‘The rise of pharmaceutical chemistry in Europe at the end of the nineteenth century
39 dovetailed with the wars of imperial expansion in Africa’ (Osseo-Asare, 2008). The 1880s
40 are the decade when British and French colonial expansion had reached its highest point and
41 new imperial nations like Germany and Belgium had just joined the global land grab, the
42 United States following a decade later taking Cuba, Puerto Rico and the Philippines from the
43 Spanish (Osseo-Asare, 2008). The Dutch and the Portuguese were hardly inactive either. The
44 infamous Berlin Conference which carved up Africa for division among the European powers
45 was concluded in 1885, the same decade as the dyestuff industry’s pharmaceutical turn
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 (Dutfield, 2009) and the appearance of Antifebrin, Antipyrin, Pyramidon and Sulfonal, the
4 first pharmaceutical industry products all of which were synthetic and had nothing to do with
5 traditional knowledge however defined. Admittedly none of these was for a tropical disease.
6
7 Nonetheless, that the industry emerged simultaneously with the Europeans' notorious
8 scramble for Africa and domination of the world is certainly intriguing. Did colonialism
9 stimulate expansion of the industry at just the right time, or have some other significance that
10 merits consideration, such as that it was underpinned by mass outbreaks of biopiracy (as we
11 now call it)?
12
13
14
15
16
17
18
19
20
21
22

23 Running empires required plenty of manpower and, in a reverse direction to today's
24 population movements, substantial numbers of European peoples moved to the tropics,
25 getting exposed to the same diseases as the native people. Economic and political interests
26 are of course very important in determining where government support and private
27 investment are directed in terms of pharmaceutical research and development. Colonialism
28 certainly did affect which diseases should be studied, hence the interest in finding cures for
29 tropical diseases and other ailments especially common in the colonies such as malaria,
30 trypanosomiasis (sleeping sickness), yellow fever and plague. Numerous schools of tropical
31 medicine were opened in Britain, Germany, other European colonial nations, and the United
32 States (Bynum, 2006). Whether imperialism stimulated the growth of the industry, if not its
33 initial emergence, is plausible. The colonies were sources of plants and ethnobotanical
34 information, and markets for products. In addition, the colonies served effectively as
35 scientific laboratories including for medical doctors (Tilley, 2011). Medical research facilities
36 were also established in the colonies, primarily of course for the benefit of the colonizers, not
37 those being colonized (Chakrabarti, 2012).
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 What is true of the past is partly true also of the present. As mentioned above, plants together
4
5 with microorganisms remain the primary source of at least a quarter of new medicines being
6
7 approved. In some cases as extracts or mixtures these were known about and used before
8
9 industrial chemists and drug companies ever got their hands on them. To name a few drugs in
10
11 the modern pharmacopoeia sourced from traditional medicine, reserpine, the vinca alkaloids,
12
13 and the opiates spring to mind. Recent additions include artemisinin, arsenic trioxide, and
14
15 nicosan.
16
17

18
19
20 Apparently the industry's initial existence does indeed owe something to traditional
21
22 knowledge. But was the relationship between industrial biomedicine and traditional medicine
23
24 purely parasitic? Or was it also symbiotic? A recent historical work on plant-based medicine
25
26 in colonial and post-colonial Africa convincingly asserts that 'herbal medicine and
27
28 pharmaceutical chemistry have mutually supportive, simultaneous histories up to the present'
29
30 (Osseo-Asare, 2014). Indeed, the author even goes so far as to claim that biomedicine and
31
32 African traditional healing 'were, in fact, actually adapted from one another.' This may go a
33
34 little too far. But it is certainly more in step with the view that the former imperial nations of
35
36 Western Europe have been shaped far more by their encounters with the people, societies and
37
38 the biodiversity of their former colonies than traditional histories that tended to be
39
40 Eurocentric and positivist were able to admit to as if there was nothing much to be learned
41
42 (Drayton, 2000). As historian Richard Drayton explains the development of European science
43
44 is intimately related not just to imperialism and commerce in natural products but also to
45
46 what nowadays we call traditional knowledge: 'what we may call the sciences of collection
47
48 and comparison – among which we may include botany, zoology, and geology – depended on
49
50 Europeans becoming exposed to the planet's physical and organic diversity, and often to the
51
52 scientific traditions of non-European people' (Drayton, 2000). In turn, as he argues, 'the
53
54
55
56
57
58
59
60

1
2
3 sciences shaped the pattern of imperial expansion'. A major consequence of this is that new
4
5 economies came to arise 'on the basis of the discovery of the raw materials for food,
6
7 medicines, dyes, and perfumes' (Ibid.). This sounds mostly quite bad. Europeans exploited
8
9 the rest and benefited from it. As is well known too, the diseases Europeans spread were
10
11 catastrophic in many places especially in the Americas.
12
13

14
15
16 But as we move towards the present one more clearly sees gains as well for the exploited.
17
18 Life-expectancy rates in most developing countries have rapidly improved since historical
19
20 times, and Western biomedicine has played a part in this including acceptance of the germ
21
22 theory of disease. Traditional medicine practitioners who are open to certain biomedical
23
24 perspectives and practices to supplement their own ones have also contributed. Most likely,
25
26 competition from biomedicine has also discredited some of the less plausible traditional
27
28 treatments and led to them being abandoned, as happened with the practice of bleeding in
29
30 Europe.
31
32

33
34
35
36 Traditional medicines are of course very much in use today. Typically, they consist of
37
38 processed or unprocessed single or mixed natural products of plant, animal or mineral origin,
39
40 administered orally in solid or liquid form. Whole plants may be used, or else plant or animal
41
42 parts or their products. Unlike pharmaceuticals they are not single chemicals obtained
43
44 through industrial processes. The notion of the *active principle*, that is, the specific compound
45
46 having the therapeutic effect, was, and remains, alien to traditional healers whose treatments
47
48 are inherently *impure* allowing for the possibility of synergisms between the various
49
50 ingredients. Further, their usage was, and still is, justified on the basis of theories of health,
51
52 sickness, well-being and efficacy, as well as cultural and spiritual values, which most modern
53
54 medical practitioners and pharmaceutical scientists understandably find impossible to accept.
55
56
57
58
59
60

1
2
3 In the West, they are subject to a very different regulatory system and tend to be sold over the
4
5 counter by retailers.
6
7

8
9
10 Encounters between European chemistry and non-European scientific traditions have had
11
12 long-term repercussions in various different ways right up to the present. Thus, in both India
13
14 and China, there is a great deal of hybridization going on in terms of describing, formulating,
15
16 making, testing, evaluating, commercialising, in the ways that therapeutic claims are justified,
17
18 and also of the growing centrality of ‘the drug’ in healthcare (Lei, 2014; Pordié and
19
20 Gaudillière, 2013). Western biomedical ways are impacting on *traditional* medicine in other
21
22 ways as the latter’s patient base expands globally. As the former aims to become more
23
24 personalized, traditional medicines as they enter mainstream markets including over-the-
25
26 counter outlets increasingly target more generalized use with standardized formulations and
27
28 dosage instructions.
29
30

31
32
33
34 One must, however, distinguish between traditional remedies and traditional knowledge-
35
36 *derived* treatments, the latter being traditional-modern hybrids. Indeed, some modern
37
38 pharmacologists are re-investigating old herbal medicines (Adams et al., 2009; Everett and
39
40 Gabra, 2014). It remains to be seen whether they will come up with some treatments to
41
42 benefit today’s patients. The very existence of the discipline of ethnopharmacology with its
43
44 own journal, founded in 1979, underlines the argument being made here, that biomedicine
45
46 and ethnobiology can and do interact – as they should. Nowadays, there is a consensus that
47
48 such cross-cultural exchanges should be subject to fair procedures of consent and benefit
49
50 sharing, at least where ethnobiological knowledge and the plants used are current rather than
51
52 merely historical hence the CBD, Nagoya and the recent activities at WIPO.
53
54
55
56
57
58
59
60

1
2
3 Much has been lost but has tradition really gained nothing from its exposure to other modes
4
5 of understanding sickness and health? Indeed, traditional knowledge in health has not gone
6
7 away, nor has it remained unchanged (Hsu, 2001; Pordié and Gaudillière, 2013). A much
8
9 cited figure from the World Health Organization is 80 percent for the proportion of the
10
11 developing country population that relies on traditional medicine to meet its primary
12
13 healthcare needs. Chinese ‘traditional’ medicine remains highly popular as are the classical
14
15 traditional South Asian systems such as Ayurveda, Siddha and Unani Tibb. These are well
16
17 documented and the systems themselves are officially sanctioned with their own recognized
18
19 training facilities and registered practitioners. They may have historical roots going back a
20
21 very long time, but they are hardly devoid of novelty or innovation. As mentioned, Chinese
22
23 medicine, for example, was not ‘traditional’ until it was named as such. Traditional Chinese
24
25 Medicine co-evolved with western scientific medicine and has accommodated elements of
26
27 modern science, for example, the germ theory of disease (Lei, 2014). This largely sums up
28
29 why the word ‘tradition’ is misleading and problematic, especially when applied broadly.
30
31
32
33
34
35

36 Of course, in other parts of the world traditional systems of health have in no way been
37
38 mainstreamed. Isolated indigenous peoples in places like the Amazon possess localized
39
40 knowledge of flora and ecosystems enabling them to meet many of their healthcare concerns.
41
42 But it is unlikely that all of the biota they exploit or the knowledge they apply are entirely
43
44 local or have ever been. Although uncontacted groups still exist in the Amazon (Lawler 2012;
45
46 Wallace, 2011) most human societies do not stay rooted to one spot over centuries *and* over a
47
48 substantial period turn their backs on the world outside their own little part of it. One
49
50 interesting aspect of traditional medicine is the way that often similar treatments for similar
51
52 ailments are used by ethnic groups in distant regions of the world. Thus the apparent oddity
53
54 of the rosy periwinkle being used as a treatment for diabetes in both the Philippines and in
55
56
57
58
59
60

1
2
3 Jamaica. Similarly, researchers have shown that species of the *Fabaceae* family of plants are
4 used as antimalarials in the Upper Negro region of the Amazon, Ghana and in coastal Kenya
5 (Frausin et al., 2015). Is there far less isolation and conservatism among ‘traditional’ groups
6 than we tend to assume, and sharing of knowledge among disparate groups is more common
7 than supposed? Or are these cases of different people facing similar health threats identifying
8 similar treatments in the plant world quite independently of each other? It would be
9 fascinating to know more, but this would take us beyond the scope of this article.
10
11
12
13
14
15
16
17
18
19

20 This might all seem esoteric or at least irrelevant. It is not. One of the difficulties we have is
21 that once we identify disparities in wealth and power we understandably see the presence of
22 an injustice and then clamour that something be done about it. Responses may be realistic and
23 effective but they may also take the form of poorly designed laws and regulations. This
24 happened with many of the national and regional access and benefit sharing regimes that have
25 mostly failed to entice commercial users of genetic resources and traditional knowledge to
26 engage in equitable partnerships with traditional knowledge holding groups. I do not wish to
27 be misunderstood about this point. There *is* injustice. It is done to indigenous peoples
28 especially, but it is done to the rest of us too albeit in a less obvious or tangible way. The
29 causes are not the above-mentioned disparities in wealth and power alone but also these legal
30 and regulatory measures intended to alleviate them. Pharmaceutical scientists *can* and *do*
31 learn from shamans and healers even if not usually directly or even consciously.
32 Notwithstanding the view that most of the low hanging fruit has most likely been gathered
33 already, one can still wonder how much more could be learned if healers and biomedical
34 researchers got together more often than they do – which is almost never. At the same time
35 indigenous peoples need much better access to the fruits of biomedicine. Legal monopolies
36 and excessive pricing get in the way. Perhaps we need to deal with both problems at the same
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 time. Indigenous peoples, like the rest of us get cancer and all the other diseases afflicting
4 humans around the world. If so many health products have arisen over centuries from
5 exchanges of knowledge and material between different societies, even under the worst
6 circumstances of colonial domination, then we should be encouraging interaction not
7 discouraging it. To the extent that intellectual property rights and the assertion of bureaucratic
8 access regulations lock up and separate knowledge and materials we are all the poorer for it.
9
10 If for once we were to look beyond the Manichean zero-sum view that views dominance and
11 subjugation as inherent conditions, we might see a rich potential for positive interaction
12 between traditional medicinal knowledge and biomedicine, just as there has famously been
13 with artemisinin.
14
15
16
17
18
19
20
21
22
23
24
25
26

27 DEFINING TRADITIONAL KNOWLEDGE: BROADLY OR NARROWLY? 28 29 30 31

32 Traditional knowledge continues to be the operative term and that is the way it is. The
33 question arises of how broad or narrow should the regime define traditional knowledge so as
34 to protect whatever is to be protected with as much effectiveness as possible? Clearly breadth
35 can be excessive. Where does traditional knowledge end if, for example, anything done to or
36 with turmeric (or some other product deemed to be a national heritage) by non-Indians is
37 deemed to be misappropriation? An excessively broad meaning will unreasonably lock up
38 vast amounts of publicly available knowledge which no identifiable group of people or nation
39 could make any credible claim to, and whose circulation can no longer realistically be
40 controlled anyway. The way that farmers in South Asia use neem tree seeds to protect their
41 crops, to give one example, really is public domain information and compensation is due to
42 nobody. It has been known about for a long time and has been well documented (Sheridan,
43 2005). The author is yet to hear of a compelling argument for saying it belongs to the farmers
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 of this generation or to the government of India, none of whom actually came up with the
4
5 idea of using neem this way. The custodianship argument, that generations ‘invest’ in the
6
7 responsibility of caring for resources and associated knowledge for future generations and
8
9 should have rights on that basis, cannot take us very far in this particular context (though it
10
11 might in others). It really is too widespread for that. Accordingly, constructing a moral case
12
13 for compensation from others’ commercial use can be a difficult if not impossible challenge.
14
15 Neither James Watson nor the families of Francis Crick or Rosalind Franklin or the UK
16
17 government has any right to claim benefits from those depicting DNA as a double helix or
18
19 taking advantage of this discovered fact of nature to make money. They did not have such an
20
21 entitlement at the time of the discovery and do not two generations later. It is hard to find a
22
23 moral case for the government of India or of any other country to claim that any knowledge
24
25 that ever came from their country that people and businesses elsewhere found commercially
26
27 useful should be compensated for even when it gets hybridized, altered or otherwise
28
29 transformed.
30
31
32
33
34
35

36 Indeed, a general presumption behind many of the attacks on neem-related patents in Europe
37
38 and the United States was that India was a victim on the basis that (a) neem is an Indian tree,
39
40 (b) the knowledge being ‘stolen’ is Indian, and (c) that neem-related patents are essentially
41
42 theft of India’s biocultural heritage. There are problems with this. First, research suggests the
43
44 species is native to a broad area, probably large another to span Afghanistan and Myanmar.
45
46 Second, the relevant ‘traditional knowledge’ is mostly very commonly known and is most
47
48 unlikely to be bounded by the artificial frontiers of modern India. Third, the tacit assertion
49
50 that all neem-related patents are biopiracy with India as victim is tantamount to the assertion
51
52 of reach-through claims over all global neem-related innovations. This is hard to justify
53
54
55
56
57
58
59
60

1
2
3 legally, morally or on policy grounds. India, as with all countries, is not biologically or
4
5 intellectually self-sufficient.
6
7

8
9
10 A narrower meaning, on the other hand, might exclude much of what many countries would
11
12 like to have protected. Even so, this would get us far closer to a workable approach. What if
13
14 one confined the legal regime to the knowledge, innovations and practices of ‘indigenous
15
16 peoples’ as defined internationally under the International Labour Organization Convention
17
18 169 Concerning Indigenous and Tribal Peoples in Independent Countries? This approach
19
20 could be justified in at least two ways. First, these are often culturally quite distinct groups of
21
22 people. Consequently for such people an item of traditional knowledge may be more
23
24 attributable unequivocally to such people. In some parts of the world, their knowledge and
25
26 ‘traditionality’ are relatively unadulterated by mainstream knowledge systems and
27
28 technologies. Second, they may have functioning customary norms governing access and use
29
30 of certain knowledge and resources they possess (Tobin, 2014, 2015). This is very important:
31
32 what is deemed to be public domain in the intellectual property sense should not
33
34 automatically be considered to be freely open for others to appropriate because rights and
35
36 duties over knowledge even after its circulation may be a matter for customary law. Why
37
38 should we not take into account their own laws? In principle we must, though how this might
39
40 be done requires further consideration.
41
42
43
44
45

46
47 There is a real dilemma here, though. By adopting this approach much of what some
48
49 countries regard as being traditional knowledge would be excluded from protection, perhaps
50
51 unfairly. Just because they may not be the originators of some valuable knowledge it does not
52
53 necessarily follow that communities have no rights over it or deserve no compensation. We
54
55 would still need to discuss this, but it is difficult to see how any *international* instrument
56
57
58
59
60

1
2
3 could really deal with this and achieve practical results. Also, we would still need to have a
4
5 conversation about the innovations of this generation including those of individuals in
6
7 communities that, in the words of the CBD, embody traditional lifestyles broadly construed?
8
9 As for indigenous peoples their levels of acculturation vary widely. Should we ignore this or
10
11 does it raise difficulties we would have to face up to? What about those who no longer live in
12
13 such communities, and not necessarily by choice? Should their knowledge, innovations and
14
15 practices be protected? After all these years important questions remain.
16
17

18
19
20 Another reasonable and very basic concern that the approach suggested here cannot fully
21
22 satisfy is that even with 'indigenous peoples' so defined, attributing knowledge to one group
23
24 and one group alone can still be controversial. To name one example, the use and knowledge
25
26 of hoodia as a thirst and appetite suppressant is almost universally attributed to the San
27
28 people of Southern Africa. However, recent research suggests the situation is not entirely
29
30 clear. While the San may well be the original discoverers, many of them did not consume it,
31
32 while various non-San and mixed populations have used it in recent centuries, and some of
33
34 them cultivated it too (Osseo-Asare, 2014).
35
36
37
38
39

40
41 Yet another dilemma arises, which this author does not yet know how best to resolve. On the
42
43 one hand, as explained above, a legal regime for traditional knowledge that focuses on
44
45 culturally distinct indigenous communities appears to be the most realistic approach.
46
47 However, for such people biopiracy is simply not the biggest problem that they face. Land
48
49 rights and other economic, social and cultural rights may be far more important. Is there a
50
51 point to seeking to protect their knowledge when their absence of legal title may be causing
52
53 them much more harm? There *is* a point to parallel campaigns to promote the various rights
54
55 that are crucial to their welfare. However, progress on land rights is probably an essential
56
57
58
59
60

1
2
3 condition for a knowledge protection regime, or regime complex linking together two or
4
5 more agreements, to work. In this sense the more holistic approach offered by the 2007
6
7 United Nations Declaration on the Rights of Indigenous Peoples is more appropriate.
8
9 Politically, confining the application of the regime in this way is a lot less interesting for
10
11 governments who may lose interest in negotiating a legal instrument because other than a few
12
13 indigenous groups who would benefit, the national economy perhaps does not stand to gain in
14
15 any substantial sense.
16
17

20 WHAT ABOUT LOCAL VALUE? 21 22 23

24
25 As mentioned above, current approaches focus on the exchange values of genetic resources
26
27 and traditional knowledge. There is a wealth of literature demonstrating that for indigenous
28
29 peoples knowledge has local value, whether commercial, practical but non-economic, cultural
30
31 or spiritual, which is far more important in peoples' everyday lives than the faint possibility
32
33 of cash injections from commercially successful bioprospecting expeditions (e.g. see Posey,
34
35 1999). Furthermore, empirical studies strongly suggest that those engaged in economic
36
37 development need to understand local knowledge, innovations, practices and norms well in
38
39 order to achieve effective policy interventions to genuinely improve the lives of local people
40
41 (e.g. Warren, Slikkerveer and Brokensha, 1995).
42
43
44
45
46

47
48 In contrast, by treating traditional knowledge as a unified, bounded counter-modern stock of
49
50 useful knowledge for outsiders, it inevitably gets reduced to an array of raw inputs for life
51
52 science corporations, which is then regulated accordingly. In doing so, we devalue it,
53
54 essentially reducing it to a random compilation of leads, hints, hopes, errors, deceptions and
55
56 *cul de sacs* from which the useful needs to be separated from the supposedly useless. The
57
58
59
60

1
2
3 rhetoric might suggest it is something more worthy and significant than that but close
4
5 inspection of how traditional knowledge gets inputted into commercially oriented scientific
6
7 research reveals that traditional knowledge has those diverse and generally rather limited
8
9 qualities in that particular context. Anyway, the persisting hopes that TK has genuine value in
10
11 that setting leads regulators and policymakers to focus their attention on the instrumental
12
13 value of TK to others, and away from the holders themselves within their own communities
14
15 and among others with which they socialize and otherwise interact. This has negative
16
17 practical implications, and the approaches being considered internationally in their current
18
19 form will not help, especially as these aforementioned leads, hints and hopes will not in most
20
21 cases be reducible to traceable and enforceable single legal claims justified by having made a
22
23 tangible contribution to a commercial product.⁹ Meanwhile, the land and other rights of
24
25 indigenous groups within the borders of countries whose representatives in Geneva clamour
26
27 for international protection of traditional knowledge continue often to be denied.
28
29
30
31
32

33 34 CONCLUSION

35
36
37
38 Indiscriminate or coercive modernization can be highly destructive. Similarly, the mixing of
39
40 knowledge systems, which *can* and certainly have been beneficial to all sides, can lead to the
41
42 harmful erosion of the economically or politically weaker people's system. So one must be
43
44 cautious in promoting the idea that all parties in exchanges can learn and benefit from each
45
46 other just as if they have always done so in the past. An international instrument that pro-
47
48 motes exchange but pays no heed to power imbalances is worse than not having an instru-
49
50 ment at all. But at a very minimum we need to know what it is that should be protected and
51
52 *how* that protection should be designed to the advantage in the first instance of weaker par-
53
54 ties. After so many years progress has moved at a glacial pace. There is absolutely no consen-
55
56
57
58
59
60

1
2
3 sus even about 'genetic resources and traditional knowledge associated with genetic re-
4 sources that occur in transboundary situations or for which it is not possible to grant or obtain
5 prior informed consent', which the Nagoya Protocol identifies as unfinished business. The
6 challenge of transboundariness is thus acknowledged as it is by a number of countries at
7 WIPO (e.g. Government of India, 2013) including in the draft articles. However, it most
8 probably applies to most traditional knowledge and genetic resources especially in the broad
9 sense that this article has been criticising. Endemicity in biology and culture is less and less
10 common. Borders are political constructs. Many ethnic groups straddle one or more borders,
11 mass population movements and diasporas have been common in human history and are cer-
12 tainly present today. Species do not have national citizenship. Article 10 of Nagoya merely
13 suggests the possibility of a global multilateral benefit-sharing mechanism to deal with these.
14 Developing such a mechanism is likely to take several more years.

15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32 Oguamanam raises some salient matters after noting that 'during modernism's golden years,
33 significant intellectual capital was invested in demarcating science from so-called pseudo
34 sciences and other pretenders thereto'. He adds that 'there has yet to be an acceptable
35 consensus among historians, philosophers and sociologists as to how to erect functional
36 boundaries across knowledge systems, especially between sciences and various categories of
37 epistemic traditions conveniently depicted as Indigenous knowledge' (Oguamanam, 2015).
38 Debates go on as to what is and is not science but the scientific method as conventionally
39 understood is undeniably powerful and has delivered us gravity, thermodynamics, relativity,
40 quantum mechanics, evolution through natural selection, the structure of DNA, effective
41 treatments for cancer, and of course nuclear weapons. One does not have to accept the
42 extreme possibilities of what he says to grasp the essential point that where tradition ends and
43 science starts is far less clear cut a matter than many suppose, and that both have and
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 continue to borrow from each other often in beneficial ways. If a global access and benefit
4 sharing regime and/or a treaty on traditional knowledge protection can assist such healthy
5 cross-fertilization in fair and equitable ways all well and good.
6
7
8
9

10
11 This article has identified basic conceptual problems that currently make such a noble goal
12 hard to achieve. The first thing we need to do is to limit ambitions to what really can be
13 achieved. Next we need to open the TK black box and make some tough decisions on what a
14 legal regime should and should not cover. WIPO's heavily bracketed draft articles discussed
15 earlier demonstrate how difficult this is to achieve, but it is really indispensable. No decision
16 on the scope of the regime will please everybody. Only a narrow definition, perhaps one that
17 would apply only to knowledge within culturally distinct groups can possibly help to deliver
18 a workable regime.
19
20
21
22
23
24
25
26
27
28
29
30
31

32 A recent development, which some consider promising in this regard, is the so-called 'tiered
33 approach' to scope of protection. This was introduced into the WIPO negotiations on TK
34 protection in 2014. The most recent edition of the aforementioned draft articles offers the
35 possibility to apply different legal, administrative and policy measures to secure traditional
36 knowledge holders' moral and material interests according to whether the knowledge is
37 secret, narrowly diffused or widely diffused. However, there is still no agreement about who
38 the 'beneficiaries' are (or are not), which makes it possible for governments and others to
39 make inappropriate claims. In addition, it remains to be seen whether this tripartite
40 differentiation of traditional knowledge 'types' is sufficiently nuanced to ensure the
41 beneficiaries are the right ones and the benefits to be gained are of the right kind and in the
42 right quantity.
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 Ultimately, it is highly unlikely that anything other than piecemeal locally-driven and
4 controlled solutions can provide much satisfaction for those keen for justice to be seen to be
5 done. Indigenous peoples should be allowed to enjoy the full value of their knowledge *to*
6 *themselves* first. Once that is achieved, they will no doubt be in a better position to exploit its
7 exchange value with scientific institutions and commercial partners. The latter will need to be
8 patient. If there is commercial value here they will wait and deal with the greater legal
9 uncertainty of an absence of international rules and of harmony in national regulatory
10 regimes.
11
12
13
14
15
16
17
18
19

20
21
22 This leads to a final point. Policymakers debating the Nagoya Protocol and seeking ways to
23 implement it must at least face up to the futility of confining the norms of exchange to
24 intellectual property rights, contracts, top-down government regulations and nothing more
25 than those. Those are the laws of the powerful. Instead, the rules and principles of the weaker
26 party should apply in the first instance. The weaker party is not the corporation, nor is it the
27 government but the indigenous peoples. That is a matter of fairness but it is also the only
28 practical basis for mutually advantageous relationships. We cannot wish away the patent
29 system, nor inappropriate heavy-handed access and benefit sharing rules which might just
30 deliver very occasional windfalls not all of which will filter down to the local level anyway.
31 Instead we need to strengthen the role of customary law as a third source of regulatory norms
32 that facilitates rather than stops two-way exchange but in ways that are culturally compatible
33 with indigenous peoples' values and that further their interests (Coombe, 2001). Either that,
34 or to develop 'hybrid approaches that interweave elements of western law and local,
35 traditional rules for the circulation of knowledge' (Brown, 2005). These laws are local or
36 national but they are not universal in their scope. What *is* universal though is that customary
37 norms are far more ubiquitous than people assume. One should avoid romanticism. Not
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3 everything about custom should be defended. But to disregard those local laws concerning
4
5 the management of natural resources and the rights and responsibilities surrounding
6
7 biological material and 'associated' knowledge which have stood the test of time and of the
8
9 numerous forced changes and disruptions to traditional lifestyles is itself tantamount to an
10
11 illegal act. The excuse of not knowing any better is no longer acceptable.
12
13

14 15 16 REFERENCES

17
18
19
20
21 Adams, M., Berset, C., Kessler, M. and Hamburger, M. (2009). Medicinal herbs for the
22
23 treatment of rheumatic disorders – a survey of European herbals from the 16th and 17th
24
25 century. *Journal of Ethnopharmacology*, 121, 343-59.
26

27
28 Angerer, K. (2011). Frog tales – on poison dart frogs, epibatidine, and the sharing of
29
30 biodiversity. *Innovation: The European Journal of Social Science Research*, 24(3), 353-69.

31
32 Arikha, N. (2007). *Passions and tempers: a history of the humours*. New York:
33
34 HarperCollins.

35
36 Bannerman, S. (2015). The World Intellectual Property Organization and traditional
37
38 knowledge. In *Indigenous intellectual property: a handbook of contemporary research*,
39
40 edited by Matthew Rimmer. Cheltenham, UK: Edward Elgar.
41

42
43 Biswas, R. (n.d.) Traditional knowledge: the curious case of turmeric latte. BIP Counsels,
44
45 [http://www.bananaip.com/ip-news-center/traditional-knowledgethe-curious-case-turmeric-](http://www.bananaip.com/ip-news-center/traditional-knowledgethe-curious-case-turmeric-latte/)
46
47 [latte/](http://www.bananaip.com/ip-news-center/traditional-knowledgethe-curious-case-turmeric-latte/) (accessed September 9, 2016).
48

49
50 Boyle, J. (2008). *The public domain: enclosing the commons of the mind*. New Haven: Yale
51
52 University Press.

53
54 Brown, M. F. (2005). Heritage trouble: recent work on the protection of intangible cultural
55
56 property. *International Journal of Cultural Property*, 12, 40-61.
57
58
59
60

- 1
2
3 Bynum, W. F. (1994). *Science and the practice of medicine in the nineteenth century*.
4
5 Cambridge: Cambridge University Press.
6
7 ---. (2006). The rise of science in medicine, 1850-1913. In *The western medical tradition:*
8
9 *1800 to 2000*, edited by Bynum, W. F., Hardy, A., Jacyna, S., Lawrence, C. and Tansey, E.
10
11 M. (eds). Cambridge: Cambridge University Press.
12
13 Carrizosa, S., Brush, S. B., Wright, B. D. and McGuire, P. E. (eds.). (2004). *Assessing*
14
15 *biodiversity and sharing the benefits: lessons from implementation of the Convention on*
16
17 *Biological Diversity*. Gland, Switzerland and Cambridge: IUCN.
18
19
20 Chakrabarti, P. (2012). *Bacteriology in British India: laboratory medicine and the tropics*.
21
22 Rochester: University of Rochester Press.
23
24 Cook, H. J. (2007). *Matters of exchange: commerce, medicine, and science in the Dutch*
25
26 *Golden Age*. New Haven: Yale University Press.
27
28
29 Coombe, R. (2001). The recognition of indigenous peoples' and community traditional
30
31 knowledge in international law, *St. Thomas Law Review*, 14, 275-85.
32
33
34 Drayton, R. (2000). *Nature's government: science, imperial Britain, and the 'improvement'*
35
36 *of the world*. New Haven: Yale University Press.
37
38
39 Dutfield, G. (2009). *Intellectual property rights and the life science industries: past, present*
40
41 *and future*. Singapore: World Scientific.
42
43 Everett, N. and Gabra, M. (2014). The pharmacology of medieval sedatives: the 'great rest'
44
45 of the Antidotarium nicolai. *Journal of Ethnopharmacology*, 155(1), 443-9
46
47 Frausin, G., Hidalgo, A. de F., Souza Lima, R. B., Kinupp, V. F., Ming, L. C., Pohlit, A. M.,
48
49 and Milliken, W. (2015). An ethnobotanical study of anti-malarial plants among indigenous
50
51 people on the Upper Negro River in the Brazilian Amazon. *Journal of Ethnopharmacology*
52
53 174: 238-52.
54
55
56
57
58
59
60

1
2
3 Gänger, S. (2015). World trade in medicinal plants from Spanish America, 1717-1815.
4
5 *Medical History*, 59(1), 44-62.

7 Government of India (2013) Statement by India at WIPO GA 2013 on the agenda item on
8
9 matters related to IGC on GRTKF delivered by Smt. Chandni Raina, Director, DIPP,
10
11 <http://www.pmindiaun.org/pages.php?id=831> (accessed September 24, 2016).

13
14 Greene, J. A. (2014). *Generic: The unbranding of modern medicine*. Baltimore: Johns
15
16 Hopkins University Press.

17
18 Greiber, T., Moreno, S. P., Åhrén, M., Nieto Carrasco, L., Kamau, E. C., Cabrera Medaglia,
19
20 J., Oliva, M. J., Perron-Welch, F. in cooperation with Ali, N. and Williams, C. (2012). *An*
21
22 *explanatory guide to the Nagoya Protocol on Access and Benefit*. Gland: IUCN.

23
24 Gupta, A. K. (2016). *Grassroots innovation: minds on the margin are not marginal minds*.
25
26 New Delhi: Penguin Books.

27
28
29 Gusfield, J. R. (1967). Tradition and modernity: misplaced polarities in the study of social
30
31 change. *American Journal of Sociology*, 72(4), 351-62.

32
33
34 Hanson, M. and G. Pomata (2017). Medicinal formulas and experiential knowledge in the
35
36 seventeenth-century epistemic exchange between China and Europe. *Isis* 108(1), 1-25.

37
38
39 Harrison, P. S. (2015). Distal horizons: an investigation of the justifiable downstream limits
40
41 to the positive protection of traditional knowledge associated with genetic resources within
42
43 drug discovery. PhD thesis, University of York, UK.

44
45 Hobsbawm, E., and Ranger, T. (eds). (1983). *The invention of tradition*. Cambridge:
46
47 Cambridge University Press.

48
49 Hsu, E. (ed.). (2001). *Innovation in Chinese medicine*. Cambridge: Cambridge University
50
51 Press.

52
53
54 Lansing, J. S. (2007). *Priests and programmers: technologies of power in the engineered*
55
56 *landscape of Bali*. Princeton: Princeton University Press.

- 1
2
3 Lawler, A. (2012). Mashco Piro tribe emerges from isolation in Peru. *Science*, 349, 679.
- 4
5 Lei, S. H. (2014). *Neither donkey nor horse: medicine in the struggle over China's*
6
7 *modernity*. Chicago: University of Chicago Press.
- 8
9
10 Long, P. O. (2001). *Openness, secrecy, authorship: technical arts and the culture of*
11
12 *knowledge from antiquity to the renaissance*. Baltimore: Johns Hopkins University Press.
- 13
14 Mgbeoji, I. (2001). Patents and traditional knowledge of the uses of plants: is a communal
15
16 patent regime part of the solution to the scourge of biopiracy? *Indiana Journal of Global*
17
18 *Legal Studies*, 9(1), 163-86.
- 19
20
21 Oguamanam, C. (2015). Pressuring 'suspect orthodoxy': traditional knowledge and the patent
22
23 system. In *Intellectual property: a handbook of contemporary research*, edited by Rimmer,
24
25 M. Cheltenham, UK: Edward Elgar.
- 26
27
28 Osseo-Asare, A. D. (2008). Bioprospecting and resistance: transforming poisoned arrows into
29
30 strophanth pills in colonial Gold Coast, 1885–1922. *Social History of Medicine*, 21(2), 269-
31
32 90.
- 33
34 ---. (2014). *Bitter roots: the search for healing plants in Africa*. Chicago and London:
35
36 University of Chicago Press.
- 37
38
39 Pelletier, P. J. and Caventou, J. B. (1820). Recherches chimiques sur les quinquinas. *Annales*
40
41 *de Chimie et Physique*, 15, 289-318.
- 42
43
44 Pordié, L. and J.-P. Gaudillière. (2013). The reformulation regime in drug discovery:
45
46 revisiting polyherbals and property rights in the ayurvedic industry. *East Asian Science,*
47
48 *Technology and Society: An International Journal*, 8, 1–23.
- 49
50
51 Posey, D. A. (ed.). (1999) *Cultural and spiritual values of biodiversity*. Nairobi and London:
52
53 UNEP and Intermediate Technology Publications.
- 54
55
56
57
58
59
60 Posey, D. A., Dutfield, G. and Plenderleith, K. (1995) Collaborative research and intellectual
property rights. *Biodiversity and Conservation*, 4(8), 892-902.

1
2
3 Robinson, D. F. (2010). *Global Biopiracy: challenges, cases and international debates*.
4
5 London: Earthscan.

6
7 ---. (2015). *Biodiversity, access and benefit sharing: global case studies*. Abingdon, UK:
8
9 Routledge.

10
11 Sheridan, C. (2005). EPO neem patent revocation revives biopiracy debate. *Nature* 23(5),
12
13 511-512.

14
15 Stockwell, B. R. (2011). *The quest for the cure: the science and stories behind the next*
16
17 *generation of medicines*. New York: Columbia University Press.

18
19 Sunder, M. (2006). The invention of traditional knowledge. *UC Davis Legal Research Paper*
20
21 *No. 75*.

22
23 Tallis, R. (2004). *Hippocratic oaths: medicine and its discontents*. London: Atlantic Books.

24
25 Tilley, H. (2011). *Africa as a living laboratory: empire, development, and the problem of*
26
27 *scientific knowledge, 1870-1950*. Chicago: Chicago University Press.

28
29 Tobin, B. (2014). *Indigenous peoples, customary law and human rights: why living law*
30
31 *matter*. Abingdon, UK: Routledge.

32
33 ---. (2015). Traditional knowledge sovereignty: the fundamental role of customary law in the
34
35 protection of traditional knowledge. In *Intellectual Property: A Handbook of Contemporary*
36
37 *Research*, edited by Matthew Rimmer. Cheltenham, UK: Edward Elgar.

38
39 Tvedt, M. W., Eijssink, V., Steen, I. H., Strand, R., and Rosendal, G. K. (2016). The missing
40
41 link in ABS: the relationship between resources and product. *Environmental Policy and Law*
42
43 46 (3-4), 227-237.

44
45 United Nations Conference on Trade and Development (2014). *The Convention on Biological*
46
47 *Diversity and the Nagoya Protocol: intellectual property implications. A handbook on the*
48
49 *interface between global access and benefit sharing rules and intellectual property*. Geneva:
50
51 UNCTAD.

1
2
3 Vogel, J. H. (ed.) 2010. *The Museum of Bioprospecting, Intellectual Property, and the Public*
4
5 *Domain*. London: Anthem Press

6
7 Wallace, S. (2011). *The unconquered: in search of the Amazon's last uncontacted tribes*.
8
9 New York: Crown Publishers.

10
11 Warren, D. M., Slikkerveer, L. J. and Brokensha, D. (eds.). (1995). *The cultural dimension of*
12
13 *development: indigenous knowledge systems*. London: Intermediate Technology Publications.

14
15 WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources,
16
17 Traditional Knowledge and Folklore. 17th Session, Geneva, December 6-10, 2010. *List and*
18
19 *brief technical explanation of various forms in which traditional knowledge may be found*.

20
21 Document prepared by the secretariat (doc. no. WIPO/GRTKF/IC/17/INF/9). Geneva: WIPO.
22
23 ---. (2016). *The protection of traditional knowledge: draft articles, rev. 2 December, 2016*.
24
25 Geneva: WIPO.

26
27 World Trade Organization, Council for Trade-related Aspects of Intellectual Property Rights.
28
29 (2004). *Elements of the obligation to disclose the source and country of origin of biological*
30
31 *resource and/or traditional knowledge used in the invention. Submission from Brazil, India,*
32
33 *Pakistan, Peru, Thailand and Venezuela* (doc. no. IP/C/W/429). Geneva: WTO.

34 35 36 37 38 39 40 NOTES

41
42
43
44 ¹ Three other elements of the regime complex on traditional knowledge are the FAO International Treaty on
45 Plant Genetic Resources for Food and Agriculture, 2001, the UNESCO Convention for the Safeguarding of the
46 Intangible Cultural Heritage, 2003, and the UNESCO Convention on the Protection and Promotion of the
47 Diversity of Cultural Expressions, 2005. However, their importance is relatively marginal in the present context
48 and will not be covered in this article.

49 ² The United States government has tended to argue for TK protection, if there should indeed be any, on the
50 basis of minor tweaks to existing forms of intellectual property. This is unacceptable to the indigenous peoples'
51 organisations observing the WIPO negotiations who are demanding a *sui generis* system founded on very
52 different principles.

53 ³ WIPO's Intergovernmental Committee has met over 30 times since 2001. The first meeting of the Conference
54 of the Parties to the CBD took place in 1994.

55 ⁴ For a useful survey of WIPO's work on traditional knowledge over the last few decades, see Bannerman
56 (2015).

57 ⁵ Law 27811 Establishing the Regime for the Protection of the Collective Knowledge of Indigenous Peoples
58 Relating to Biological Resources, 10 August 2002; Law 28216 on Protection of Access to Peruvian Biological
59 Diversity and to the Collective Knowledge of the Indigenous Peoples, 1 May 2004.

1
2
3
4⁶ Or similar (in usage if not meaning) words like western or scientific.

5⁷ This is not to suggest that this word is immune to criticism either, but that we do not consider it on this
6 occasion.

7⁸ For an excellent early critique highlighting the fallacies and harms caused by the use of tradition and modern
8 as if they are binary opposites, see Gusfield, 1967.

9⁹ Albeit expressed rather differently, a similar argument is made by Angerer, 2011. Related to this difficulty is
10 the issue of potentially extensive distance in material and cognitive terms between biological material and
11 associated TK, the invention claimed in a patent, and a final product. Should benefit sharing obligations be
12 calibrated so as to be in proportion to distance according to some kind of measurement? Accordingly, all other
13 things being equal, the shorter the distance the greater would be the benefits. Similarly: Harrison, 2015; also see
14 Tvedt et al, 2016.
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

For Peer Review