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# **Identifying and resisting the technological drift: green space, blue space and ecotherapy.**

## **Abstract**

There has been a growing interest in recent years into the health and wellbeing benefits of natural ‘green’ and ‘blue’ spaces. This theoretical paper presents a critical review of the proposed ways to operationalise these benefits for mental health. Following the social theories of Jacques Ellul and Gernot Bohme – in which technology is defined as a system of rules and rationality rather than devices and hardware - we propose that a process of ‘technological drift’ occurs when a body of evidence is put into practice in human activities (operationalized). We identify a technological colonization of nature, in which nature itself is assimilated into a technological niche to act as a ‘technical solution to a technical problem’. Examples of this are the use of medical language like ‘dose’ and ‘prescription’, the attempt to separate effect mechanisms and pathways and the professionalization and division of labour. Technological drift in nature exposure and health is congruent with a wider efficiency culture that reduces nature to a resource for human use. In conclusion we propose that nature exposure could be not just an adjunct to healthcare systems but also disruptive to them in a positive and emancipatory way.

**Key Words:** Mental Health. Ecotherapy. Green space. Nature. Technology.  
**Jacques Ellul**

## Introduction

Evidence has been accruing in recent decades for the beneficial effect that exposure to nature has on human health and wellbeing (Hartig *et al.*, 2014, Frumkin *et al.*, 2017, Bloomfield, 2017). The experience of viewing, passing through and actively participating within so called ‘green’ and ‘blue’ space has been positively connected with multiple indicators of both physical and mental health. Frumkin has argued that this is a necessary corrective to the previous medical focus on environments as containers of risks and hazards to health, such as natural disasters, radiation and toxins (Frumkin, 2001). This trend has also been notable in popular culture, with multiple books – including Richard Louv’s ‘Last Child in the Woods’, Richard Mabey’s ‘Nature Cure’ and Florence William’s ‘The Nature Fix’ –, media coverage of health practices such as ‘cold-water swimming’ and the adoption and deployment of new pseudo-technical terms such as ‘Nature Deficit Disorder’.

The health and nature research is presented with a heterogeneous selection of terminology, including ‘green space’ (Conniff and Craig, 2016, Bell *et al.*, 2014) and ‘blue space’ (White *et al.*, 2010, Bell *et al.*, 2015) – referring respectively to land and water areas identified as ‘natural’ to varying extents and distinct from ‘grey’ urban and industrial spaces. A wider array of terms is applied in the research to describe the particular wellbeing focused activities that go on in these ‘natural’ spaces including ‘eco-therapy’ (Wilson *et al.*, 2008), ‘social and therapeutic horticulture (STH)’ (Diamant and Waterhouse, 2010), ‘care farming’ (Leck, Upton and Evans, 2015), ‘forest bathing’ (Ochiai *et al.*, 2015), ‘adventure therapy’ (Willis, 2011), and ‘green exercise’ (Olafsdottir, Cloke and Vögele, 2017). Terms are sometimes combined, such as green exercise referring to fitness activities occurring in green spaces, or are treated separately with green space and blue space as more abstract population-level constructs and adventure therapy (for example) taking place in more vaguely defined spaces. Also all of these terms are frequently situated within wider concurrent health and wellbeing

discourses such as ‘social prescribing’ (Bragg and Leck, 2017) and ‘lifestyle interventions’ (Walsh, 2011) - often as a way to locate the research within the existing healthcare field or to integrate it into systems and policy frameworks.

While this burgeoning interest in nature and health is to be welcomed as a potentially novel and significant strand of public health discourse, it also raises numerous philosophical and ethical issues. At a time when the global environment is under considerable pressure from multiple human induced factors, including climate change, resource depletion and pollution, the ways in which we conceptualise the human-planetary relationship are both contested and consequential (Watts *et al.*, 2017). To expand this point for clarity we are proposing that the nature and health domain is a) embedded within a contested field of competing worldviews and paradigms, and b) actions taken in this domain will have particular intended and unintended consequences. As an example, the characterisation of health benefits from nature could be seen as another material product to add to the list of those available from the physical environment, such as oxygen, minerals or fresh water. Martin Heidegger described this approach to ‘nature as resource’ as reducing it to a ‘standing reserve’ (Heidegger, 2011 [1954], 225) awaiting an ‘unlocking’ (p. 224) process. If it is this thinking frame that characterises the benefits derived from nature in public health discourse then this leads to certain sets of practices and interventions. In this way nature becomes operationalised for health in numerous different and contested ways.

Our use of the term ‘operationalised’ is central to the argument that we wish to present in this theoretical paper. The term refers to the concrete activities that are employed to make an abstract concept or a body of research efficacious in real-life situations to particular target populations. Thus there is no *one obvious way* to access the proposed health benefits of exposure to nature – the evidence base emerges (and is received) in a social context composed of research practices, health care institutions, government policies and multiple

actors with complex and competing motivations. It is in these settings, with their constraints, opportunities, assumptions and cultures that the health benefits of nature will be put into action – operationalised – in multiple situated ways. To develop this insight further we point to the extensive literature on the contested and deeply cultural framing of what counts as ‘nature’, and what doesn’t (Cronon, 1996, Castree, 2005), - as indicated by the huge diversity of human lifeways that have existed across the span of time and geography and their multiple contingent and consequential ways of constructing a relationship with the physical world (WHO, 2017, 12-14). In our discussion we seek to avoid the somewhat crass urban-rural distinction that is sometimes taken as a proxy for describing levels of exposure to nature. We endorse the ‘unravelling of the binary geography of urban-rural/wild’(Francis, Lorimer and Raco, 2013, 682) whilst acknowledging that the widespread lay use of the term ‘nature’ often centres around such a straightforward division (Crowther, 2018, 13-15), as does its application as a shorthand in health and medical disciplines (Gruebner *et al.*, 2017, Cox *et al.*, 2017a).

The purpose of this theoretical paper is to identify and to critically assess some of the commonly proposed ways to operationalise the benefits of nature for human health and wellbeing. From this critical analysis we suggest the potential negative effects of an unreflective uptake of these ‘ways’ in policies and practices. Our analysis centres on the mental health benefits (although these do not separate neatly from physical health benefits) associated with exposure to nature and the way this can become reduced into a technological discourse. We use the term ‘technological drift’ to express this process. The concepts of ‘technique’ proposed by Jacques Ellul (1964 [1954]) and ‘technification’ proposed by Gernot Bohme (2012 [2008]) provide the framework of analysis that we apply to our discussion of the operationalisation of the mental health benefits of nature. We commence by outlining the

mental health field, before describing the process of technological drift and then offer suggestions for how this could occur in the domain of nature and health.

## **Mental Health and Nature**

Mental health issues are a significant public health challenge in modern societies, making up 22% of the burden of disability and having direct and indirect costs amounting to Euro 450 billion in the European Union (EU, 2016, 4). As the World Health Organisation (WHO) states in the European Mental Health Action Plan:

Mental disorders are one of the greatest public health challenges in the European Region as measured by prevalence, burden of disease and disability. Mental health problems, including depression, anxiety and schizophrenia, are the main cause of disability and early retirement in many countries and a major burden to economies, demanding policy action (WHO, 2013, 2)

It is also significant to note here that European societies are highly urbanised (estimated to be 80% of the population by 2030) (Carmichael *et al.*, 2017) and the prevalence of mental health problems has a close relationship with urban living (Gruebner *et al.*, 2017). This is significant because the nature and health domain largely relies on a premise that modern cultures have a separation from nature – exemplified by what has been described as the ‘extinction of experience’ (of the natural world) (Soga and Gaston, 2016) in these urban settings. The axiomatic assertion that in modern cultures nature is something distinct and separate from humans and their societies is widely described in the social science literature as the ‘nature/culture’ dualism (Jerolmack, 2012). A linear cause-effect relationship is hard to establish in such a contested field, but - even allowing for a complexity that escapes a binary formula of separation-connection - it remains hugely significant that a reduced exposure to natural phenomena is potentially problematic for human health.

We are keen to establish at this stage that although the term ‘nature’ is used widely within what we have called the ‘nature and health’ domain we acknowledge that it is a contested and problematic term. Nature cannot credibly be seen ‘as a pure, singular and stable domain removed from and defined in relation to urban, industrial society’ (Lorimer, 2012, 593), and the tendency to set it up in this dualistic framework is emblematic of the very modernity (as epoch) and modernist thinking that we critique in this paper. Thus, for the purpose of brevity, the use of the term nature in this piece relates to how it is applied in the literature of ‘green space’, ‘blue space’ and ‘ecotherapy’, rather than meaning an ontologically distinct or stable entity.

Exposure to nature has been demonstrated to improve mental health in numerous ways, including through the reduction of stress (Olafsdottir, Cloke and Vögele, 2017), attention restoration (Berto, 2005), improved mood (Joye and Bolderdijk, 2015), slowing of cognitive ageing (Cherrie *et al.*, 2017), frequency of exercise (Gladwell *et al.*, 2013), increased life satisfaction (Korpela *et al.*, 2008), social connection (Chen, Tu and Ho, 2013) and better sleep hygiene (Stothard *et al.*, 2017). Bloomfield (2017) notes that the evidence for mental health benefits of nature is ‘substantial’ and although ‘findings are of variable reliability’ ‘there is a consistent positive trend’ (p. 82). Studies have generally focused on a tripartite typology of exposure to nature (Burls, 2007, 28, Bell *et al.*, 2014, 288):

1. *Indirect*. Such as viewing green spaces through a window or looking at a picture of a natural environment.
2. *Incidental*. Such as being present in a green/natural environment, but for a reason other than ‘nature connection’. For example, walking from A to B via a park.
3. *Intentional*. Such as deliberate and active participation in an environment specifically chosen for its green/natural merits.

These three subdivisions of nature exposure do not relate to a problematic distinction between the urban and rural – all three of them occur within what has been called ‘nearby nature’ enmeshed with the largest of cities, just as all three types of exposure occur within protected/designated ‘exceptional’ landscapes, such as National Parks.

In addition to the tripartite framework referenced above the benefits of nature to mental health are often analysed with either a *treatment* (Wilson et al., 2008) or *prevention* (Nieuwenhuijsen et al., 2017) focus. The treatment focus directed towards a clinical population and the prevention at a wider general population at different points across the lifespan. The treatment thread of research is located around time bounded interventions for specific diagnoses, such as a course of surfing for Post-Traumatic Stress Disorder (PTSD) (Rogers, Mallinson and Peppers, 2014). The prevention thread can include actions such as improving the size, quality or access to neighbourhood green spaces like parks, changing working/educational practices to integrate nature exposure, or bringing nature ‘inside’ living and working spaces using plants, images or novel design features. This treatment/prevention division is not, however, a neat dualism and the shape of each blurs and overlaps.

### **Technology and technological drift**

To approach a critical analysis of the operationalisation of mental health benefits derived from nature we use a framework devised by Jacques Ellul (1965 [1954]) and developed by Gernot Bohme (2012 [2008]). Jacques Ellul was a French theologian and sociologist who wrote extensively about modern society. His argument was that technological rationality, a logic promoting efficient means above all other considerations, has come to dominate all areas of modern life. This has parallels with Max Weber’s concept of ‘rationalization’(Weber, 2010 [1905]) and also the analysis of ‘instrumental rationality’



pursued by members of the Frankfurt School including Horkheimer, Adorno (Horkheimer and Adorno, 2016 [1947]) and Marcuse (Marcuse, 2002 [1964]). Ellul criticises the widespread tacit definition of technology as a series of devices and machines and instead places ‘technique’ as ‘the *totality of methods rationally arrived at and having absolute efficiency ... in every field of human activity*’ (Ellul, 1964 [1954], xxv). This is a strand in the philosophy of technology that defines technology as ‘a matter of rules rather than of hardware’ (Dusek, 2006, 54) or, to phrase it another way, certain manifestations of means-ends relationships. By focusing on machines in isolation, Ellul argues, one misses the point of the wider frame of efficiency which requires society to be ordered so as to construct ‘the kind of world the machine needs’ (Ellul, 1964 [1954], 5). An example of this is the replacement of seasonal and day/night cycles as a shape to life with the widespread use of measured clock time that was required by industrial production and urbanization (Griffiths, 2000). It has not taken many generations for this shape of life to become the norm in modern urban societies, in this sense, Ellul theorizes, technique is hidden from view by becoming naturalized in a short time span.

To illustrate the vital distinction between a ‘hardware’ definition of technology and a ‘rules/rationality’ definition to be taken from Ellul’s work we would highlight the issue of technologically *mediated* nature exposure. There are numerous cases whereby a particular technological device (‘hardware’), such as a virtual reality (VR) headset (White *et al.*, 2018) or a smartphone app, is used in a health and nature exposure context. This can also be seen in the multiple studies that have taken place comparing the effects of exposure to *simulated* nature (such as videos and photographs) and *real* nature (Brooks *et al.*, 2017). These devices tend to be employed with the aim of access enablement for populations with restricted mobility or other barriers to leaving urban and built environments. A critique of these

practices - which fall into the definition of ‘indirect’ exposure to nature discussed previously – can be made by focusing on the particular hardware devices in use. If one were to mention in conversation *technology as a problem for nature exposure* the image that immediately springs to mind, we suggest, is something akin to the use of VR headsets or smartphones in green and blue spaces. The very obvious and *hard* application of technology in these cases makes the critique far more straightforward and the potential pitfalls of using such technologies to operationalize nature for human health can be seen without particularly lengthy reflexivity.

Using a ‘hardware’ shaped definition of technology allows that machines and devices can be used for either good or bad, depending on the preference, values or end purpose of the individual or organization that makes use of them (Ellul, 1964 [1954], 96 & 111) . Continuing the nature mediation example above, this would mean that if someone had a dislike of digital technology or its use was identified to be problematic in some fashion it could be ‘switched off’ or restricted/rationed in some way – our point being that agency to act in this situation is retained by the user. The ‘rules’ definition of technology used by Ellul posits, however, that ‘technique’ circumvents any consideration of wider values, making them redundant. Technique cannot consider meaningful ends, metaphysical values or any number of non-instrumental rationales, as there isn’t even a space for them on its balance sheet of efficient means (p. 133). This also affects the agency of any individual actor caught up in a rules based system of technique; so while an individual may hold values and have a reasoning capacity that conflicts with the ‘means’ being employed in a given situation their agency to act in a way outside these rules will be considerably compromised.

There are three key points that we summarize from Ellul's philosophy of technique and apply to our analysis of the process of technological drift:

- 1) Technology defines the parameters of the possible.
- 2) Technology is a set of rules, laws and procedures rather than devices or gadgets.
- 3) Technology has a sole focus on efficiency and enacts this by separating means from ends.

Examples of 'technique' are described in the following sections, but as an illustration to distinguish this from the hardware definition of technology we would return to the relationship between measured clock time and the organization of daily life in the modern world. The mechanical clock in this example is not significant of itself, but the significance lies within its wider relationships within a changing economy – including privatized/enclosed agricultural commons, secularization, urbanization and global trade - and in tandem with other machines, such as factory production, gas lighting and steam ships/railways. Ellul's point that technique becomes naturalized and so obscured from consideration can be seen from this example - with the contemporary hegemony of standardized (and ever more precise) measured time that 'defines the parameters of the possible', is widely accepted as 'efficient' and is perpetuated by 'rules, laws and procedures'.

Gernot Bohme (2012 [2008]) has a similar orientation to the rules based definition of technology and continues the thread of Ellul's 'technique' argument, albeit updated for a context 40 years later. He uses the term 'technification' as a continuation of Weber's rationalization and Ellul's technique, but he argues that in the 21<sup>st</sup> Century rather than viewing instrumental rationality as an 'iron cage' enclosing the human subject (as Weber did) the process is more akin to a 'skeleton' forming the subject's shape from within. Hence Bohme's use of the term 'invasive technification'. Bohme's ideas are distinct from Ellul's in

that he suggests that efficiency as a sole focus has in practice been replaced by change for its own sake and often manifesting - ironically - in inefficient practices. Also, whilst there existed an outside to the iron cage of rationality, such as in nature or direct unmediated human communication, the invasive level of technification obscures the very concept of outside - it has 'penetrated deep into social activity' to an extent that it is the 'technical conditions of life that determine how life is lived' (Bohme, 2012 [2008], 5). Other social theorists have noted this increasingly invasive process, for example Deleuze (Deleuze, 1992) and Hardt (Hardt, 1998) gave it the name 'control society', as a form that replaces the 'disciplinary society' of large institutions such as prisons and asylums. In the post-modern world, Hardt argues, 'there is no more outside'; the 'walls of the institutions are breaking down', but not as the downfall of disciplinary technique but as its generalization 'across the social field'. Bohme thus summarizes the invasive effects of the application of technologies and techniques – and it can be noted how his analysis goes beyond machines and devices (hardware) themselves to describe the relations/rationality that become implicit:

...through their very existence, they set the conditions of the possibility of the lives of individuals and societies. Driving a car is not simply a more efficient form of walking, to phone someone is not simply to speak to him at a distance, a sleeping pill is not simply a faster means of falling asleep, and the integration of our society via the internet is no mere rationalization of human interaction. As a systematic array of material means, technology does not simply leave the human relationships whose fulfillment it serves as they were, it transforms them structurally (Bohme, 2012 [2008], 17)

From an analysis of the philosophies of Ellul and Bohme we propose that a process of technological drift occurs when a body of evidence is operationalized in human activities. Technological drift is not a term used by either Ellul or Bohme, but we deploy it as a useful shorthand synthesis of their philosophies. These theorists, or any substantial application of social theory for that matter, is largely lacking from the nature and health literature. We recognize the work of Ellul and Bohme as a valuable place to start this intervention into the field because they identify a paradigmatic frame that sheds light on much of the taken for granted logic that we see shaping our daily lives in modern societies. They have limitations, including the critique of technological determinism that is frequently directed at Ellul (Feenberg, 1992), but they remain a useful introductory nexus between the fields of social theory and nature/health. The term drift, as we use it, indicates a subtle – initially almost imperceptible but becoming stronger (with compound interest) over time – movement away from what was intended or envisaged in a situation. It thus rejects any intentionality or conspiratorial motivations from actors caught up in the process of technological drift – a vital point to grasp if we are to accurately identify ways to be oppositional and to effect change. Technological drift fundamentally changes the original aim or end purpose of an activity as it is put into operation so that it comes to appear only a pale shadow of the envisaged potentiality it once held.

### **Identifying the technological drift: the colonization of nature**

The distinct strand of nature exposure for health that is amenable to the technological drift critique can be seen as a *colonization* of nature, in contrast to the *mediation* of nature discussed previously. This more subtle, but also invasive, process is indicative of the generalization of technical rationality (or logic) across the social field. Colonization of nature differs to mediation of nature in that it does not just provide a means to access nature (albeit a

potentially reductive mediation), it actually assimilates nature into a technological niche. To be clear, we are making the claim that *nature becomes a technology* in this context. This strand of technological drift requires a lengthy and deliberate reflexivity due to the assumed primacy of efficient means that have an axiomatic status in what Ellul (1964 [1954]) calls ‘technological societies’ – ‘The one best way’ (p. 80) will be identified and applied in all cases, and will swiftly become naturalized and so hidden from view, according to his analysis;

Every intervention of technique is in effect, a reduction of facts, forces, phenomena, means and instruments to the schema of logic (p. 79).

This logic works on both problem identification and proposing a solution to these identified problems. Ellul classifies this orientation as ‘self-augmentation’ (p 90) of technique in which a linear concept of technical progress is perpetuated by being embedded in the wider context:

...technique in its development, poses primarily technical problems which consequently can only be resolved by technique (p. 92).

Thus, in the context of our analysis, conditions such as depression come to be seen as technical problems (e.g., in the widespread, but contested, biomedical model of psychiatry) and the noted wellbeing effects of nature exposure then require a technical framing in order to be applied as a solution. It is at this point that the assimilation/colonization of nature occurs in order to operationalize it for the problem at hand - nature, in effect, has to *become a technology to solve a technological problem*.

It is also notable that in the technical approach to problem identification and solution there is scant mention of the genesis of a problem. This is an example of the exclusion of wider factors from consideration in the application of ‘efficient’ means. An illustration of this is the axiom of modern individuals being separate from nature that informs the discourse of nature and health; this discourse promotes exposure to nature as a bridging of the separation, but too infrequently raises the question of why there is a separation in the first place and where its origins could lie. Discussion of why this separation has an axiomatic status and what the drivers of such a separation could be would potentially raise non-technical issues, such as questions of how culture shapes a person’s way of going about the activities of daily life. This would pose a fundamental challenge to the dominant paradigm shaped around the technical formulation of problem and solution.

### **Prescribing a dose of nature.**

The ‘colonization of nature’ strand of technological drift can be seen in the use of medical language such as ‘dose’ (Cox *et al.*, 2017b), ‘prescription’ (Ulmer *et al.*, 2016) or ‘treatment’ (Wilson *et al.*, 2008) when nature is proposed as a solution to health problems. Terminology used in this way makes nature sound sensible within the narratives that are familiar to health research, policy and institutions. This is an example of ‘technology defining the parameters of the possible’ – where once there were multiple potential ways to be in salutogenic relationship with nature, in its operationalization in healthcare domains we find it reduced to ‘standing reserve’. As Heidegger (2011 [1954]) suggested, when nature is seen as ‘resource’ it is awaiting an ‘unlocking’ process provided by a human technical means (a prescription for example). Add to this an amount described as a ‘dose of nature’ and we know how much of the resource will need to be ‘unlocked’ to solve our problem of non-communicable disease.

In this example nature has been assimilated into a technological niche and it is on the way to becoming indistinguishable from a box of tablets on a pharmacy shelf.

The use of semantics in this way is not limited to nature exposure, the dose-response relationship has been more widely critiqued as not being appropriate to transfer from its origins in toxicology to public health issues (Whitelaw, 2012). The ‘five-a-day’ diet campaign intended to increase fruit and vegetable intake is an example of the dose-response relationship as an ‘over-extended analogy’ (Whitelaw, 2012. p. 436). The dose-response analogy is frequently used with the instrumental purposes: 1) to ‘simplify complexity’; 2) to ‘associate behavioural interventions with clinical practice’ and; c) to act as part of ‘a regulatory regime of what Foucault has termed “governmentality”’ (‘self regulatory control’) (p.428). The prescription, dose and treatment narrative can be seen to contribute to the process of technological drift in its assimilation/colonization strand – there is no conspiracy in play, it merely represents a pragmatic way to ‘efficiently’ deliver some of the health benefits of nature exposure.

### **Mechanisms and pathways.**

Technological drift can also be perceived in the search for pathways or mechanisms to explain the effects of nature on wellbeing. This approach looks to separate particular cause-effect pathways or mechanisms (Kuo, 2015, Nieuwenhuijsen *et al.*, 2017, Conniff and Craig, 2016) from their instance in a certain person, group, city or neighbourhood. To this end, out of 21 potential pathways Kuo (2015) identifies improved immune function as a credible ‘central pathway’, based on the criteria that ‘it can account for the size of nature’s impacts on health’, ‘account for specific health outcomes tied to nature’, and ‘subsumes other pathways’ (p. 4).



If this is indeed the case then to solve the technical issue of immune function in an individual a solution could be found not in exposure to a ‘wild’ and unpredictable *natural* place, but in the application of some form of efficient treatment by a professional in a clinic (such as pharmaceutical technologies or faecal transplant). Kuo (2015) does not suggest this, it is a hypothetical scenario based on the logic naturalised in technological societies. Also to be noted in this case is that any consideration of the genesis of the technical problem is obscured by the problem-solution frame applied – the question of why a population is allegedly separated from nature in urban settings and so experiences compromised immune function is not pertinent.

This is an example of Ellul’s point that technology has a sole focus on efficiency and enacts this by separating means from ends. In a critique of the Improving Access to Psychological Therapies (IAPT) initiative in the UK (a primary care psychological therapies service) Timimi suggests that a similar process is going on, an illustration that is easily transferable to the nature and health domain:

The search for the ‘active ingredients’ of a psychological therapy is anyway likely to be doomed to failure because it depends on the false assumption that such ingredients are delivered by therapists in a uniform manner regardless of the state, requirements and input of the patients. (Timimi, 2015, 57-58)

Just as this leads to the reduction and simplification of the complexities of the therapeutic relationship in psychotherapy, so too will identifying a particular mechanism of effect or testing out pathway plausibility in nature based interventions. As Ellul warns - the means that are discovered will, once put into action, obscure consideration of holistic or meaningful

ends. To uncritically pursue this technological drift could hypothetically lead to a situation where the green space that was initially found to benefit health is lost to urban development because its wellbeing effect can be preserved and accessed by humans in a more efficient decontextualized form. This risk dovetails with the technological mediation of nature example discussed above in that with decreasing amounts of green space in rapidly growing urban centres there is the potential for over reliance on using devices such as VR and smartphone apps. Bohme (2012 [2008]) describes this as the provision of ‘substitute satisfaction’ to compensate for the ‘impoverishment of experience’ (p. 123).

### **Professionalization and division of labour.**

A third area in which the process of technological drift can be perceived is in professionalization and division of labour within the nature and health field. To integrate an intervention into the health field requires a negotiation of roles and responsibilities – who delivers this intervention? Who has the knowledge and skills? How is this going to be regulated and evaluated? This includes whether ‘nature’ will be an add-on to health professionals remit, or healthcare training will be added to outdoor/conservation professions, or whether a third distinct professional grouping will develop. Nature as a resource for healthcare is a domain in its infancy from a professionalization perspective – although, as noted previously – accessing the health benefits of nature is as old as the human species. This newly reified *nature as healthcare technology* will require ‘technicians’ and evaluation measures to ensure a standardised, quality controlled and transferable product can be efficiently delivered. There are numerous examples of this already in parts of the world, including certification and continuing professional development (CPD) provided by The Association of Nature and Forest Therapy Guides and Programs in North America (and more recently in Europe and Central America) (ANFTG), and ‘all delivery staff undergoing a

uniform training programme' in the Branching Out scheme run by the Forestry Commission in Scotland (Willis and Osman, 2016, 5).

From a technological drift perspective this could mean the narrowing of a multiplicity of lay/informal/common ways to access the salutogenic effects of nature – a process akin to the physical enclosure of the commons that has been a part of the modernising process in many parts of the world and has moved in tandem with so called technological progress. Bohme (2012 [2008]) suggests that the field of medical care is a prime exemplar of the professionalization process by documenting how caring activities with 'a knowledge grounded firmly in practice' have had to either 'cede their original independence to technically trained medical professionals' or carers have 'gone down the path of professionalization' (p.44) (he cites nurses and midwives as examples).

Professionalization is entirely congruent with a wider culture within healthcare. As Peacock and Nolan state 'The spread of outcome-orientated health services has led to care being redefined as the provision of the finest form of treatment that is financially viable' (Peacock and Nolan, 2000, 1066). This includes the rise of evidence-based healthcare and an audit culture that demands quantitative measurement and reporting of interventions, outcomes and services. Whilst this is not without its merits in terms of making a service that is on some level safe, accountable, standardized and predictable, it necessarily entails embarking on a process of technological drift. Mental health policy in particular has been identified as having the characteristics of a 'wicked problem' (Hannigan and Coffey, 2011), in which 'problems are constructed in ways which reflect sets of values or prevailing interests' [...] 'such that only certain courses of action are available without the problem needing to be redefined',

cause-and-effect are not straightforward and unexpected ‘waves of consequences’ (221) may be triggered.

The caring professions noted above have been widely critiqued for becoming *task orientated* rather than *person centred* (Hutchinson, Jackson and Wilson, 2018) and there is no reason to suggest that nature and health – once efficiently integrated into healthcare – will be any different. As nature is colonised as a technology training courses will need to be offered to endow ‘experts’ with the knowledge required to operationalise these resources efficiently (as we illustrated in the examples above). This links back to the technical problem-solution nexus described above, as:

the authority to frame problems – the ability to speak about them in a relevant way – remains everywhere the sole prerogative of professional groups (Bohme 2012 [2008] 45)

In addition to professionalization these expert groups become increasingly specialised through a division of labour and fields of practice splinter into an array of fine-grained professions. Through the increasingly reified boundaries and specified focuses of these divisions of labour the wider perspective – including the ability to identify the process of technological drift – can become obscured.

### **Technological drift in context**

Interestingly a similar process to these *drift* examples has been identified in the increasing use of the term ‘natural capital’ to integrate nature (or ‘ecosystem services’) into the language, processes and rationality of neoliberal economics (Read and Scott Cato, 2014, Ernstson and Sörlin, 2013). In this instance despite a ‘superficial pragmatic appeal’ (p163) of something that brings ‘nature’ into economic visibility, it is a reductive visibility that by ‘the act of

pricing itself values nature in terms of non-nature' (p. 162). In other words quantifying the *services* provided by nature as a monetary value makes them tradable and, by logical extension, makes them replaceable by non-nature. They conclude that, despite good intentions, as nature is 'placed essentially under the hegemony of anthropocentric, reductionist economics' we see 'a continuation of the very economics that has led our world to the brink of disaster' (Read and Scott Cato, 2014, 164).

Returning to the nature and mental health debate the processes of nature disconnection and the roots of our modernist healthcare systems within the same processes need to be brought to light. This seems particularly pertinent in the failure of solely medical approaches to provide a meaningful response to the complexities of people's experience of mental distress. A pragmatic attempt to fit nature into healthcare language and institutions as an adjunct to them risks perpetuating the processes of nature disconnection that are the genesis of the problem in the first place. To equate nature on the same balance sheet as a drug technology that can be *prescribed* at the correct *dose* is akin to attributing a number of *ecosystem services* to nature - a concept that:

'is now exerting considerable agency amongst powerful decision-makers and is acting to block a clear view of the course of action required to resolve the ecological crisis that our economic activity has given rise to' (Read and Scott Cato, 2014, p. 166);

- just as the technical problem-solution nexus identified in this paper obscures consideration of the genesis of the modern axiomatic separation from nature that is detrimental to human wellbeing. Thus by taking the pragmatic approach in facilitating nature exposure for mental health there is a very real risk that by inducing a technological drift this pragmatism will do more harm than good.

## Conclusion

This paper has presented a critique of the trend of *technological drift* that has become a part of human engagements with the world. The strength and ubiquity of this trend is what led Jacques Ellul to coin the phrase ‘Technological Society’ to describe the paradigm within which many of us find ourselves living. We suggested ways that this process could be seen to be unfolding in nature exposure and health domains. This is not to criticize the motives of researchers or practitioners working to increase our understanding of the health benefits of nature; according to Bohme the process that we call technological drift has become so naturalized and invasive (or pre-reflective) that it is becoming almost impossible to step back and reflect on what is happening anyway. As this paper is primarily a theoretical analysis we suggest that much further empirical research is needed into the concept of ‘colonization’ of nature by what Ellul called technique. This could include the qualitative analysis of how professionalization, pathway/mechanism identification and nature on prescription are playing out or unfolding in real-life contexts.

We propose a number of steps that may be useful in bringing technological drift to light and to resist its unfolding; Firstly, an engagement with human-nature connection as an alternative narrative rather than as an adjunct to existing healthcare institutions, models and policies. From a mental health perspective this could include assessing nature connection as emancipatory in the light of service-user, survivor or critical psychiatry movements that don’t rely on the medical model as a hegemonic framework. This will require looking beyond the ‘efficient integration’ of nature to the potential for nature exposure to be troubling, disruptive and informing ‘ends’ just as much as ‘means’. In addition a sustained engagement with ‘modernity’ as a sociological concept needs to be cultivated in the nature and health domain – this is vital in constructively addressing a nexus of problem and solution (proliferation of

mental health issues and nature disconnection/connection) that are a distinct and novel product of western modernity. This includes critically engaging with narratives of nature and health that originate in non-western cultures; these approaches are often rooted in the trauma inflicted by the expansion of modernity and are allied with resistance to this colonization (Panelli and Tipa, 2007, Wilson, 2003, Gibbs, 2010). Finally, and connected to this, it must be reflected upon that modernist healthcare is by its nature an anthropocentric enterprise - it has grown up as a paradigm intended to address human needs for health and wellbeing. In this context the use of 'nature as resource' via technological drift is myopic, but understandable. Concepts that challenge anthropocentrism, such as relationality, hybridity and non-human agency (Fox and Alldred, 2015, Yusoff, 2012), could help but are more familiar to geography, cultural studies and related disciplines than they are to health and medical sciences. In a context when the health of the planet cannot be taken for granted and, in any case, does not separate in a neat fashion from the health of the humans occupying it (Watts *et al.*, 2017), the ability to engage with complexity is vital and disciplinary myopia is unacceptable. Through critical and genuine inter/multi-disciplinary work a holistic and sustainable engagement with nature for the purpose of health may be possible.

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