

# 'You will never walk again ... but you will fly': Human augmentation in the known world

Catherine Easton\*

## Introduction

This article explores how interactions in the known world can provide insights into the regulatory environment relating to human augmentation technology. While drawing upon wider aspects of the known world, the main focus for this debate is Brandon, Bran Stark, fourth child of Eddard and Catelyn Stark. These fictional characters are found in the fantasy world created by George R. R. Martin in his "Game of Thrones" series.<sup>1</sup> As his journey develops he connects with his surroundings in a number of ways which enhance his core self and support his progress. Through placing Bran's story within the legal environment relating to enhancement technology, observations can be made about the current regulatory framework and how it can evolve to address technological advancements.

**Comment [CR1]:** Throughout the article, the author doesn't cite or mention anything about the *Game of Thrones* tv show or any of the books. Therefore, for readers who haven't watched *Game of Thrones*, it is not clear where the story of Bran Stark comes from (readers could think the author has made it up).

Perhaps mention here that he is a fictional character in *A Game of Thrones*. At the least, insert a reference to either the tv show or book(s) (whichever the author has pulled the story from which she refers to throughout the article).

## Introducing Bran Stark

We first meet Bran as an eight year old boy enjoying a carefree existence living in the north with his parents, the Lord and Lady of Winterfell, and his five siblings. He is an energetic, curious boy with a fondness for climbing the walls of Winterfell. While on one of his many climbing expeditions he passes a high window and sees an incestuous liaison between the twins Jaime and Cersei Lannister. Desperate to silence the child, Jaime attempts to murder him by pushing him, causing him to lose his grip and fall to the ground. The attempt on Bran's life is unsuccessful and he survives but falls into a coma. While in this coma, he first starts to experience intense visions within his dreams which often involve a three-eyed crow.

The incident has permanent consequences as Bran is left unable to use his legs. This changes the future of this young boy who had spent countless hours learning how to use his weapons and dreaming of becoming a knight. While confined to his bed, Bran no longer wants to hear stories of battles and noblemen and instead listens to tales of the old ways of magic. As Bran struggles to come to terms with his new situation, life at Winterfell continues. On his journey back from sating his curiosity about life in the Night's Watch at the Wall, Tyrion Lannister, younger brother of Jamie and Cersei, makes a stop at Winterfell. Tyrion is a dwarf, as Jon Snow, Bran's half-brother describes him: 'struggling to keep pace on stunted legs. His head was too large for his body.'<sup>2</sup>

Due to his appearance, Tyrion has experienced lifelong discrimination and is known by derogatory names such as 'the imp' and 'the halfman'. Prejudice against those whose appearance or capabilities diverge from an accepted norm have been found in modern society and can be latent to the point that those holding the prejudice

**Comment [CR2]:** Insert reference for the quote used.

There are several spots throughout the article where a *Game of Thrones* book or tv show is cited or quoted but no reference is given. At the least, a reference should be provided for the quotes.

\* Lecturer, Law School, Lancaster University.

<sup>1</sup> [Game of Thrones Season 1 Warner Home Video, 2011 Episode 1 "Winter is Coming"](#)

<sup>2</sup> [Ibid](#)

are not overtly aware of these attitudes.<sup>3</sup> This notion of otherness can give rise, at a subconscious level, to society perceiving greater differences than those that prevail in reality, leading to increased societal segregation and discrimination.<sup>4</sup> These norms have, through history, been found to influence the development of policy and the regulatory environment.<sup>5</sup>

Within the known world, this notion of otherness in relation to Tyrion can be seen at a very extreme level in the words of his own father, Tywin, as he states: ‘You are an ill-made, spiteful little creature full of envy, lust, and low cunning’.<sup>6</sup> Tyrion attempts to protect himself from the harsh responses of others with reliance on his quick wit and bleak humour:

Cersei Lannister: You’re a clever man. But you’re not half as clever as you think you are.  
Tyrion Lannister: Still makes me cleverer than you.<sup>7</sup>

This shield can fall at times of extreme stress, such as during his trial for murder, as demonstrated by the following exchange:

Tyrion Lannister: I’m guilty of a far more monstrous crime: I’m guilty of being a dwarf.  
Tywin Lannister: You are not on trial for being a dwarf.  
Tyrion Lannister: Oh, yes I am. I’ve been on trial for that my entire life.<sup>8</sup>

The use of tactics to deflect negative treatment is apparent in the discourse surrounding the medical model of disability which praises the plucky individual for having the resources to overcome adversity.<sup>9</sup> This is at odds with the social model which, at a basic level, moves the emphasis onto society to remove the disabling barriers it collectively places upon those who differ from an accepted norm.<sup>10</sup>

The response of others to his difference has had a pervasive impact upon Tyrion’s life and, it seems, it is the recognition of the experience of difference that leads to him empathising with Bran’s situation. Indeed, in Tyrion’s own words: ‘I have a tender spot in my heart for cripples and bastards and broken things’.<sup>11</sup> He draws up plans for a saddle adapted to enable Bran to ride and these are given to Maester Luwin who reassures a doubtful Bran that it will work.

## Bran’s assistive technology

The adapted saddle is built and it enables Bran to ride a horse and, with shortened weapons, hunt. In this way we see technology allowing Brandon to travel and carry out tasks independently. Nussbaum holds that in regulatory framework there is a need

<sup>3</sup> Julie Smart, *Disability, Society, and the Individual* (Aspen, 2001).

<sup>4</sup> Robert Bogdan and James Knoll, ‘The Sociology of Disability’ in Edward L Meyen and Thomas M Skrtic (eds), *Special Education and Student Disability* (Love Publishing Company, 1995) 677–711.

<sup>5</sup> Gillian Fulcher, *Disabling Policies? A Comparative Approach to Education Policy and Disability* (Falmer Press, 1989).

<sup>6</sup> [Game of Thrones Season 3 Warner Home Video, 2013 Episode 1 “Valar Dohaeris”](#) **INSERT REFERENCE.**

<sup>7</sup> [Ibid](#) **INSERT REFERENCE.**

<sup>8</sup> [Game of Thrones Season 4 Warner Home Video, 2014 Episode 6 “The Laws of Gods and Men”](#) **INSERT REFERENCE.**

<sup>9</sup> Marie Johnston, ‘Models of Disability’ (1996) 9(5) *The Psychologist* 205.

<sup>10</sup> Colin Barnes, *Disability Studies: What’s the Point?* (Gladnet, 2003).

<sup>11</sup> [Game of Thrones Season 1 Warner Home Video, 2011 Episode 4 “Cripples, Bastards and Broken Things”](#) **INSERT REFERENCE.**

**Comment [CR3]:** Insert reference for the quote used.

**Comment [CR4]:** Insert reference for the quote.

**Comment [CR5]:** Insert reference for the quote.

**Comment [CR6]:** Insert reference for the quote.

to support ‘capabilities of life, health, and bodily integrity and ... provide stimulation for senses, imagination and thought’.<sup>12</sup> The saddle mechanism allow Bran to achieve a capability that was previously denied to him — as Tyrion stated: ‘on horseback you will be as tall as any of them’.<sup>13</sup>

Assistive technology has a history stretching back many thousands of years; a leather and wood prosthetic foot dating back to the 15<sup>th</sup> century BC was found in the tomb of a priest in Egypt.<sup>14</sup> Around the fourth century BC there were reports of Seneca the Younger using a glass filled with water to enlarge written text to read all the books in Rome.<sup>15</sup> Indeed, technologies such as the typewriter and the telephone were developed from an initial interest in supporting disabled people.<sup>16</sup>

The relationship between technology and disability has been criticised from the perspective that its use can lead to further isolation<sup>17</sup> and it can place the emphasis on the individual to take measures rather than on the political and social environment which creates barriers.<sup>18</sup> In this way technology could be linked to a medical model based response with it being employed as a way of curing a problem inherent in the individual.<sup>19</sup> Roulstone holds that too strong a focus on the potential of technology to impact upon the lives of disabled people can detract from the realities of unequal access.<sup>20</sup> In relation to information technology, this phenomenon has been identified as the ‘digital divide’ which sees unequal access exacerbating existing socio-economic divisions.<sup>21</sup> These divides have also been determined in relation to access to medical technologies.<sup>22</sup> Bran as the son of the Lord of Winterfell has access not only to a nobleman of the intellect of Tyrion who could design his saddle but also to the resources and manpower to build it. If a child of lesser means (for example, Mycah the butcher’s son) were in a situation similar to Bran’s it is highly unlikely that he would have access to this technology or a horse as a mode of transport. Indeed, later as Bran is forced to flee when Winterfell initially falls to Theon Greyjoy, he no longer has the resources his previous status afforded him. In the swift decline in his fortunes he leaves behind his saddle and horse and relies upon his servants Hodor and Osha, and his younger brother’s direwolves.

**Comment [CR7]:** Insert reference for the quote.

<sup>12</sup> Martha Nussbaum, ‘Capabilities and Disabilities’ (2002) 30(2) *Philosophical Topics* 133.

<sup>13</sup> [Supra n:1 INSERT REFERENCE.](#)

<sup>14</sup> Alan J Thurston, ‘Paré and Prosthetics: The Early History of Artificial Limbs’ (2007) 77(12) *ANZ Journal of Surgery* 1114.

<sup>15</sup> Corey Adams, ‘A Historical Review of the Methods for Correcting Refractive Impairments: Patient Care or Technological Advancements’ (Paper presented at the 13<sup>th</sup> Annual History of Medicine Days, The University of Calgary, 19 March 2004). Available at <<http://www.ucalgary.ca/uofc/Others/HOM/Proceedings-2004.pdf>>.

<sup>16</sup> Nancy M Crewe and Irving Kenneth Zola, *Independent Living for Physically Disabled People* (iUniverse, 2001) 263.

<sup>17</sup> Sally French, ‘What’s So Great About Independence?’ in John Swain et al (eds), *Disabling Barriers, Enabling Environments* (Sage, 1993) 45–8.

<sup>18</sup> Michael Oliver, *The Politics of Disablement* (Macmillan, 1990).

<sup>19</sup> Thomas Balkany, Annelle V Hodges and Kenneth W Goodman, ‘Ethics of Cochlear Implantation in Young Children’ (1996) 114 *Otolaryngology — Head and Neck Surgery* 748.

<sup>20</sup> Alan Roulstone, ‘Access to New Technology in the Employment of Disabled People’ in John Swain et al (eds), *Disabling Barriers, Enabling Environments* (Sage, 1993) 241–8.

<sup>21</sup> Benjamin M Compaigne (ed), *The Digital Divide: Facing a Crisis or Creating a Myth?* (The MIT Press, 2001) 100.

<sup>22</sup> Heather M Fortnum, David H Marshall and A Quentin Summerfield, ‘Epidemiology of the UK Population of Hearing-Impaired Children, Including Characteristics of Those With and Without Cochlear Implants: Aetiology, Comorbidity and Affluence’ (2002) 41(3) *International Journal of Audiology* 170.

## Inequality of access

The transformation in Bran's fortune sheds light upon inequalities of access and the need for regulatory frameworks to develop in a non-discriminatory manner. An early pioneer of the social model, Vic Finkelstein,<sup>23</sup> illustrated the concept of an oppressive society that excluded those who did not conform to an accepted standard of normality through the example of a village. This imagined village consists of wheelchair-using settlers who create a world designed to fit their requirements. When a group of non-disabled settlers wish to inhabit the village they find the design of the built environment obstructive, constantly injure themselves on architecture not aimed for those of their stature, and require medical attention, which is controlled by their seemingly more effective counterparts. In this scenario it is the wheelchair users who see the non-wheelchair users as the 'less-normal other',<sup>24</sup> to be charitably pitied and provided with the wheelchair users' perception of adequate medical care and aids developed to facilitate their existence. The concept of universal design<sup>25</sup> relates to the need for design in society to enable the environment, products and services to be accessible to the largest possible number of people. In relation to access for disabled people, a set of standards were developed and first published in 1961 in the USA to provide guidelines for the barrier-free design of buildings and facilities.<sup>26</sup> These were then referenced in anti-discrimination statutes such as the *Americans with Disabilities Act of 1990*.<sup>27</sup> Universal design seeks to go further than mandating that guidelines are followed to provide the mere provision of retrospective add-ons to an existing normalcy, as found in the approach of the medical model.<sup>28</sup> As Duncan explains:

Universal design extends beyond the confines of accessibility to include all persons and creates that inclusion by promoting integrated and mainstreamed products, environmental features, and services.<sup>29</sup>

While this concept aims to transform societal attitudes to place inclusion at the heart of development, it is an approach that has been difficult to translate into a normative framework. In the UK, the *Equality Act 2010*<sup>30</sup> lays down the requirement for anticipatory reasonable adjustments to remove barriers for disabled people and, in this way, avoid discriminatory practice. The anticipatory nature of these requirements do to some extent push towards achieving a situation in which inclusion is embedded from the outset, but this is offset by the reliance on 'adjustments' which envisages changes to original inaccessible design. With rapid technological change, these provisions, which were originally created to apply to the physical environment and

<sup>23</sup> Vic Finkelstein, 'Phase 2: Discovering the Person in "Disability" and "Rehabilitation"' (1975) 27(1) *Magic Carpet* 31.

<sup>24</sup> Ibid p35 -~~INSERT PAGE NUMBER~~.

<sup>25</sup> Ronald L Mace, 'Universal Design, Barrier Free Environments for Everyone' (1985) 33(1) *Designers West* 147-152.

<sup>26</sup> American National Standard, *Accessible and Usable Buildings and Facilities*, ICC A117.1-2009, 20 October 2010. Available at <<https://law.resource.org/pub/us/code/ibr/ansi.a117.1.2009.pdf>>.

<sup>27</sup> 42 USC § 12101 (2013).

<sup>28</sup> Gerard Goggin and Christopher Newell, 'Communicating Disability: What's the Matter With Internet Studies?' (Paper presented at Proceedings of the Australian and New Zealand Communications Association 2002 Conference, Coolangatta, 10 July 2002).

<sup>29</sup> Richard Duncan, 'Universal Design — Clarification and Development' (Report, Ministry of the Environment, Government of Norway, March 2007). Available at <[http://www.universell-utforming.miljo.no/file\\_upload/udclarification.pdf](http://www.universell-utforming.miljo.no/file_upload/udclarification.pdf)>.

<sup>30</sup> *Equality Act 2010* (UK) c 15.

**Comment [CR8]:** Insert page number of Vic Finkelstein article where 'less-normal other' comes from.

**Comment [CR9]:** The footnote originally said:

*Mace, R., L., Universal Design, in Designers West. 1985*

I have updated this to what I think is the correct citation based on what other authors have cited. But:

- (1) I can't find any journal called 'Designers West' in order to confirm, and
- (2) a minority of authors cited 'Designers West' as though it was a book. They did not include the title 'Universal Design, Barrier Free Environments for Everyone'.

Perhaps check with the author that I have cited the correct source.

**Comment [C10]:** Yes this is correct now, thanks

services, have needed to evolve to apply to newer, virtual spaces. This evolution can be analysed through revisiting Bran's journey and development.

## Bran's visions

The visions Bran experienced during his coma become more frequent, often featuring a three-eyed crow. In his dreams he is his direwolf, Summer, and experiences the world as this animal. After Winterfell falls to Theon, Bran and his friends Meera and Jojen Reed head north in search of the three-eyed crow. On their journey Jojen intimates to Bran that he is a warg or 'skinchanger'. This involves having an ability that begins with dreams, often focused on interacting with the environment through the eyes and experiences of an animal. This ability, with practice, develops into the power to enter and control the other being.

While growing up at Winterfell, Bran had learned about these powers, saying to Maester Luwin: 'Old Nan used to tell me stories about magical people who could live inside stags, birds, wolves'.<sup>31</sup> A person skinchanging or warging into an animal will pass into a partially comatose state with glazed eyes as his or her consciousness passes into the animal. As Bran begins to make further use of his powers he starts to enjoy the feeling. Jojen counsels him that if he uses his powers too much there is the danger that he will become trapped. Bran's ability is particularly powerful and at one point he is able to enter the mind of a person, Hodor, to calm him down and avert an attack by wildlings.

On his journey, Hodor is carrying Bran as he no longer has access to his horse and modified saddle. In this way he is reliant upon the agency of another to move in the physical world. However, through his powers as a warg he is able to perceive and interact with an element of his environment at a whole new level. This is a more intense type of experience, as Bran states: 'The wolf dreams are better. I smell things, and sometimes I can taste the blood'.<sup>32</sup> In this way the power of his mind is enhancing his interactions. These experiences are reflected in the way that information technology has developed to the point at which it can augment human beings' interaction with the environment at a number of levels. As outlined above, certain types of everyday technologies were initially developed or extended to aid disabled people, and this approach is being reflected in the evolution of modern information technology-based products and systems. Autonomous or 'driverless' cars have been identified as a technology that could, with supportive legal and policy responses, revolutionise the lives of disabled people.<sup>33</sup> Similarly, a market is developing in 'cognitive tools' which aid users to fulfil tasks in the workplace.<sup>34</sup> These include systems such as My Bionic Brain, PEAT and Biozen, which have, following the theme of universality outlined above, become generally used.<sup>35</sup>

**Comment [CR11]:** Insert reference for the quote used.

**Comment [CR12]:** Insert reference for the quote used.

**Comment [CR13]:** Insert reference for My Bionic Brain, PEAT and Biozen.

<sup>31</sup> [Game of Thrones Season 2 Warner Home Video, 2012 Episode 3 "What is Dead may Never Die" \[INSERT REFERENCE\]](#)

<sup>32</sup> [George R. R. Martin A Clash of Kings A Song of Ice and Fire, Book 2 Harper Voyager, 2011 Bran 1 p55 \[INSERT REFERENCE\]](#)

<sup>33</sup> Heather Bradshaw-Martin and Catherine Easton, 'Autonomous or "Driverless" Cars and Disability: A Legal and Ethical Analysis' (2014) 20(3) *European Journal of Current Legal Issues*. Available at <<http://webjcli.org/article/view/344/471>>.

<sup>34</sup> Robert J Szczerba, 'Using Technology to Mitigate Cognitive Disabilities', *Forbes* (online), 30 July 2014 <<http://www.forbes.com/sites/robertszczerba/2014/07/30/using-technology-to-mitigate-cognitive-disabilities/>>.

<sup>35</sup> [Ibid \[INSERT REFERENCE\]](#)

Ongoing research has led to the development of experience-enhancing technology, such as the Disney Haptic system that uses the air to deliver tactile sensations.<sup>36</sup> A vortex is created that holds its shape while travelling over large distances; this then hits a user's skin in a way that can be perceived as a moving object. A demonstration of the system shows butterflies being projected onto a participant's arms. While these interactive experiences are being developed mainly for entertainment purposes, the technology has the potential to enhance the lives of people with, for example, sight or motor impairments. In a similar way, the development of Google Glass, while positioned as a mass-market product, has heralded the first movements towards available wearable technology that could allow a whole new level of interaction with the environment.<sup>37</sup> While having privacy implications, the ability to connect to real-time online information and record interactions could, again, have the potential to support, for example, people with hearing impairments and those with learning impairments. In a similar way, through the use of his powers, Bran is able to enhance his experiences beyond those of people with conventional minds. These technological advancements are developing to the level at which they can combine with the human to provide augmented and enhanced individuals.

**Comment [CR14]:** Insert reference for Google Glass.

## When humans and technology merge

Neil Harbisson is an artist who suffers from the condition achromatopsia; a form of colour-blindness that only allows him to see in grayscale. Harbisson has an antennae osseointegrated into his skull; a state in which the implanted device is anchored firmly to the bone without fibrous tissue between the two.<sup>38</sup> This antennae enables him to, as a colour blind human, perceive colours as sounds and music directly in his head. The colours he can perceive go beyond those visible to the ordinary human eye, as he can detect ultraviolet and infrareds. He reports that the more diverse the colours in a scene are, the more impressive they sound, with supermarket shelves sounding much more spectacular than a conventionally beautiful landscape.<sup>39</sup>

**Comment [CR15]:** Insert reference for this sentence. As far as I can see, this sentence does not come from the previous source (ie, *The Guardian* article on Neil Harbisson).

In a reflection of Bran's powers, through technology Harbisson has been able to augment his interaction with the world, enabling him to have experiences at a level not available to non-augmented others. From an ethical perspective, there is a need to evaluate how these enhancements can impact upon identity and the notion of what it is to be human. As addressed in the UK Government-commissioned report 'The Future of Identity':

<sup>36</sup> Rajinder Sodhi et al, *Aireal: Interactive Tactile Experiences in Free Air 2012* (Disney Research, 2013). Available at <<http://www.disneyresearch.com/project/aireal/>>.

<sup>37</sup> James Meikle [Home-bound man uses drone and Google Glass to experience flight](http://www.theguardian.com/society/2014/nov/25/drone-stuart-turner-disability-scientists) *The Guardian* (online) 25<sup>th</sup> November 2014 <http://www.theguardian.com/society/2014/nov/25/drone-stuart-turner-disability-scientists> [Accessed 13/05/15] [INSERT REFERENCE]

<sup>38</sup> Stuart Jeffries, 'Neil Harbisson: The World's First Cyborg Artist', *The Guardian* (online), 6 May 2014 <<http://www.theguardian.com/artanddesign/2014/may/06/neil-harbisson-worlds-first-cyborg-artist>>.

<sup>39</sup> [CyborgFoundation Neil Harbisson: Cyborg Artist \(online\) Barcelona 2013 p2 http://i-docs.org/wp-content/uploads/2014/01/Neil-Harbisson-A-cyborg-artist.pdf](http://i-docs.org/wp-content/uploads/2014/01/Neil-Harbisson-A-cyborg-artist.pdf) [Accessed 13/05/15] [INSERT REFERENCE]

**Formatted:** Superscript



Personality could be directly affected, or indirectly affected if the implants for example allow increased cognitive abilities that change their perspective on life — obviously this can be a positive change in many situations.<sup>40</sup>

One of the conclusions of the authors is that with the growth of technologically enhanced identity there will be a need for policy to develop in the light of this fluid form of individuality. The legal framework needs to adapt to this changing notion of what it is to be human and the extent to which augmentation technology can be deemed to be either property or an essential part of the individual his or herself.<sup>41</sup>

Linda Macdonald Glenn outlines a useful real-life case study in which she provides advice through which to evaluate key legal issues.<sup>42</sup> The case study involves a 63-year-old disabled man — in the overview he is, for the purposes of privacy, given the name Mr Collins, who is classed as 100% disabled and an incomplete paraplegic. Due to this, he is dependent upon a mobile assistance device ('MAD'). This not only aids in mobility but avoids potentially dangerous episodes of low blood pressure. Glenn continues to outline that in October 2009 Mr Collins took a flight and, while in transit, his MAD was damaged and no longer worked. While the airline took responsibility for the damage, it took some months to make this assessment and Mr Collins did not receive a replacement, functional MAD for another 11 months. During this time Mr Collins's quality of life was significantly diminished. He subsequently put in a claim for damages to the airline in relation to the expenses he incurred when unable, due to the unavailability of the MAD, to follow the independent life he previously had. Furthermore he had incurred expenses due to the need for extra help during this time and he had suffered a number of illnesses due to his decreased mobility. The airline accepted responsibility in relation to negligence in dealing with the equipment but disputed the nature of the damages claimed. They held that they had merely damaged property and, as this was later replaced, the airline argued that its liability had been met.

Glenn explains how the adjuster needed informing about the exact nature of the MAD, how it interacted with Mr Collins, and how it was much more than a wheelchair, mere equipment. In this way the case study raises the issue of how the law approaches human augmentation technology. A key question is whether the MAD is considered to be damaged property or whether, due to its capabilities, it is to be considered as an essential element of Mr Collins's personhood. Although Mr Collins is able to exist without it, the MAD functions in the place of most of his limbs and it appears, as Glenn states, 'by harming his MAD, the harm extended to Mr Collins'.<sup>43</sup> The MAD, while non-biological, could be said to be an integral part of the biological human.

The term 'cyborg' can be used in numerous ways, one of which sees it applied to the restorative use of technology to, as in Mr Collins's case, replace lost functionality.<sup>44</sup> At a time when uses of such technologies are becoming evermore sophisticated and prevalent, there is a need to determine how the law treats such a

---

<sup>40</sup> Nick Bostrom and Anders Sandberg, 'The Future of Identity' (Report, Commissioned by the UK Government Office for Science, 2011) 42. Available at <<http://www.fhi.ox.ac.uk/future-of-identity.pdf>>.

<sup>41</sup> Ibid 50–1.

<sup>42</sup> Linda MacDonald Glenn, 'Case Study: Ethical and Legal Issues in Human Machine Mergers (Or the Cyborgs Cometh)' (2012) 21(1) *Annals of Health Law* 175.

<sup>43</sup> Ibid 177.

<sup>44</sup> Chris Hables Gray, Steven Mentor and Heidi Figueroa-Sarriera (eds), *The Cyborg Handbook* (Routledge, 1995) 3.

blurring of boundaries. Glenn looks to the 1922 US case of *New Bedford Dry Dock Company v Purdy*<sup>45</sup> to find historical legal precedent. The case involved a dispute in which it was crucial, for the purposes of legal jurisdiction, to determine whether or not significant works on a ship amounted to repairs or the complete rebuilding of the vessel. The aim was to convert the ship from a car-transporting vehicle into an amusement craft. The debate centred on the extent to which the ‘identity’ of the vessel had been transformed due to the additions made to it. This was addressed in the following way:

[I]f any considerable part of the hull and skeleton of an old vessel in its intact condition, without being broken up, is built upon, the law holds that in such a case it is the old vessel rebuilt, and not a new vessel.<sup>46</sup>

The judgement states that if an intact frame or ‘skeleton’ is built upon then, despite the changes in appearance and function, the end result is a change to the original rather than a completely new entity. Applying this reasoning, it can be argued that the technology Mr Collins employed to replace lost functionality is an integral part of himself as a natural legal person. Following this, the award for damages to the MAD should include damages for harm to Mr Collins himself, not merely his property. The case was finally settled out of court for USD20 000 but the arguments raised could be influential in shaping the future of the law’s interaction with adaptive technology.

A number of questions arise relating to how the law would treat systems which can augment the human experience. Neil Harbisson, during a demonstration, was approached by police who damaged his antenna, believing that he was filming. Following the argument put forward in Mr Collins’s case, Harbisson would be entitled to claim damages for personal injury and perhaps the aggressors could be prosecuted for an offence against the person. Given the predicted growth in wearable sensory technology,<sup>47</sup> it is likely that a court will soon be in a position to adjudicate on this matter. At a wider normative level, relevant international treaties can be examined to determine how the law is shifting to address technological evolution.

### **The United Nations *Convention on the Rights of Persons with Disabilities***<sup>48</sup>

The United Nations *Convention on the Rights of Persons with Disabilities* (‘UNCRPD’) was adopted in 2006 and entered into force in 2008. As an international human rights convention, it aims to provide clarification to the framework of rights for disabled people and in turn strengthen the enforcement of these rights.

In art 9, the UNCRPD enshrines a right of access to ‘[i]nformation, communications and other services, including electronic services and emergency services’,<sup>49</sup> and requires States to take measures to ‘[p]romote access for persons with disabilities to new information and communications technologies and systems,

---

<sup>45</sup> 258 US 96 (1922).

<sup>46</sup> Ibid [11].

<sup>47</sup> PwC, *Wearable Technology Future is Ripe for Growth — Most Notably Among Millennials* (21 October 2014) <<http://www.pwc.com/us/en/press-releases/2014/wearable-technology-future.jhtml>>.

<sup>48</sup> *Convention on the Rights of Persons with Disabilities*, opened for signature 30 March 2007, 2515 UNTS 3 (entered into force 3 May 2008).

<sup>49</sup> Ibid art 9(1)(b).



including the Internet'.<sup>50</sup> This express statement of the importance of communications technology unequivocally places duties on States Parties to ensure that their legal system upholds equality of access but also, crucially, that further regulatory measures are put in place to support compliance. This is particularly important as even in countries which, through law, expressly mandate a duty to provide accessible websites, levels of accessibility are persistently low.<sup>51</sup> In relation to guidelines, the UNCRPD places a duty<sup>52</sup> on its Signatory Parties to promote research into, and development of, universally designed products and to promote universal design in standards development. Within the UNCRPD the concept is defined as 'the design of products, environments, programmes and services to be usable by all people, to the greatest extent possible'.<sup>53</sup> The provision goes further and states specifically that this measure does not exclude the use of assistive technologies. This strengthens the concept of pre-emptive planning in design to be as inclusive as possible and to avoid the need for retrospective adjustments to an accepted norm.

While the UNCRPD's provisions lay down a legal right of access to communications technology such as the internet, a measure can be found which relates to technologies such as Harbisson's antennae or Mr Collins's MAD. The UNCRPD does not specifically address the issue of augmentation technologies in particular but holds that States Parties need

[t]o undertake or promote research and development of, and to promote the availability and use of new technologies, including information and communications technologies, mobility aids, devices and assistive technologies, suitable for persons with disabilities, giving priority to technologies at an affordable cost.<sup>54</sup>

This is a general provision which is drafted to be as technologically-neutral as possible. The inclusion of 'information ... technologies' accepts that the state of the art has moved on from the purely physical, as portrayed by Bran's riding equipment, to complex software-enabled systems such as Mr Collins's MAD. Within the article itself and its reference to 'affordable cost'<sup>55</sup> there is an indication of both the financial cost of research and development in this area alongside the pressing need to make such technologies available to all at a non-prohibitive cost. It is accepted that as this is an international treaty the notion of 'affordable' would need to be addressed on a relative basis.

The UNCRPD, as an international legal instrument, contains innovative bridging provisions that aim to support Signatory Parties in the implementation of the measures it contains. These can be found in art 33 which outlines the need to 'designate one or more focal points within government for matters relating to the implementation of the present Convention'. Furthermore, there is an overarching obligation 'to promote, protect and monitor implementation of the present Convention'.<sup>56</sup> The UNCRPD itself was drafted in a unique, collaborative manner that facilitated and financed the

---

<sup>50</sup> Ibid art 9(2)(g).

<sup>51</sup> Technosite, 'Study on Economic Assessment for Improving Accessibility Services and Products' (Final report, SMART 2009-0072, European Commission, 2012) 15. Available at <<http://www.eaccessibility-impacts.eu/researchResults.aspx>>.

<sup>52</sup> *Convention on the Rights of Persons with Disabilities*, opened for signature 30 March 2007, 2515 UNTS 3 (entered into force 3 May 2008) art 4(1)(g).

<sup>53</sup> Ibid art 2.

<sup>54</sup> Ibid art 4(1)(g).

<sup>55</sup> Ibid.

<sup>56</sup> Ibid art 33(2).

participation of disabled people throughout the negotiations.<sup>57</sup> The UNCRPD then supports this in its art 33(3) which requires that Signatory States ensure that disabled people are involved in the development of national implementation measures. These provisions go further than those in similar treaties and indicate a commitment to using international provisions to bring about tangible change at a domestic level.

## Conclusions

Bran Stark's journey through the known world provides a useful narrative against which to examine access and the development of technology. From early days humans have developed ways of using technology such as Bran's riding equipment to aid interaction with the physical world. The social model of disability has identified a disabling society which creates barriers by designing for an accepted norm. Anti-discrimination legislation has addressed this with the notion of reasonable adjustments and, in turn, anticipatory duties in relation to access. Universal design as a concept has found validation at an international level in the UNCRPD and addresses the need to ensure that the environment, both physical and virtual, is designed in a way that supports access for as many people as possible, irrespective of individual difference. There is a need, however, for further regulatory measures such as support for education and training, to bring about a change in attitudes and the acceptance of diversity of experience.

As Bran's story unfolds, he discovers that he has powers to encounter the world through the eyes of others, allowing him to connect with his environment at a deeper level. These new experiences can be reflected in the development of technological systems such as Google Glass and Disney Haptic which can extend and enhance interactions with the world.<sup>58</sup> These technologies can augment abilities, as in the case of Neil Harbisson's antenna which allows him to hear colours. There is a legal question to be asked in relation to the point at which assistive or augmentative technology is deemed to be an integral part of the human being and, as such, should be treated as part of the same entity. Strong arguments, as in the case of Mr Collins, can be made for the law to recognise that augmentation technology can now form a fundamental aspect of the human and needs to be protected as such. At an international level, the importance of access to information technology has been specifically enshrined in the UNCRPD, alongside the need to fund research into assistive, and potentially augmentative, technologies to support disabled people. However, the UNCRPD itself recognises the need for these systems to be as affordable as possible and this has to be set against the reality that disabled people often fall into lower socio-economic groups.<sup>59</sup>

As Henry Greely states, 'the story of humanity is the history of enhancement' and technology has now developed to a point at which it can extend and enhance human ability.<sup>60</sup> As Bran's journey demonstrates, these extra-human abilities can bring

<sup>57</sup> Tracy R Justesen and Troy R Justesen, 'An Analysis of the Development and Adoption of the United Nations Convention Recognizing the Rights of Individuals with Disabilities: Why the United States Refuses to Sign this UN Convention' (2007) 14(2) *Human Rights Brief* 36.

<sup>58</sup> See Sodhi et al, above n 36 and Meikle above n37-[\[INSERT CROSS-REFERENCE TO GOOGLE GLASS\]](#).

<sup>59</sup> Anne M Kavanagh et al, 'Time Trends in Socio-Economic Inequalities for Women and Men With Disabilities in Australia: Evidence of Persisting Inequalities' (2013) 12 *International Journal for Equity in Health* 73.

<sup>60</sup> Henry T Greely, 'Regulating Human Biological Enhancements: Questionable Justifications and International Complications' (2005) 7 *University of Technology Sydney Law Review* 87.

**Comment [CR16]:** Preferably insert cross-reference to the Google Glass footnote above (the Google Glass footnote is still to be inserted by the author). I have already cross-referenced the Disney Haptic footnote.

entirely new facets to the experiences of disabled people. The legal and regulatory environment has adapted to accommodate some of the changes heralded by technological development but, given that augmentation is now a reality, there is a need for a radical, ongoing re-examination of how the law defines what it means to be human.