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GRAPHIC AND NOVEL: AN ARTS AND LAW PROJECT

Dr Shawn H.E. Harmon *

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* Lecturer in Regulation & Risk, University of Edinburgh; Deputy Director, J Kenyon Mason Institute for Medicine, Life Sciences and Law; Research Associate, Innogen Institute; Joint Editor-in-Chief, Medical Law International.

Graphic and Novel: An Arts and Law Project

Dr Shawn H.E. Harmon *

Introduction

Science has both encouraged instrumental changes in the way we interact with the natural world, and facilitated paradigm shifts in how we understand that world and our place in it. These changes, like science itself, can be accelerated or slowed, facilitated or hindered, entrenched or reshaped through regulation.¹ The complex relationship that exists between science, regulation and change means that both science and regulation are not only appropriate subjects for socio-ethical consideration, but are only *justified* when they have been subject to such consideration. Importantly, that consideration must not be limited to policy or academic settings, but must include wider publics. Indeed, Susan Greenfield, former head of the Royal Institution, once suggested that the engagement of the public in science, and the expression of scientific ideas in ways that can be understood, is a key *scientific* challenge.² Of course, the same observation is applicable to law, and, importantly, to law as it relates to science. In the Graphic and Novel Project (GNP),³ we used graphic speculative fiction (SF) to articulate some of the legal and ethical issues around the development of the biosciences and their governance, the aim being to develop a tool that might facilitate legal education and encourage meaningful social discourses around science and law. In the course of developing our tool – an illustrated SF novel – we explored the often troubled history of public engagement around science and its governance and the often ambiguous and contested relationship that science has with SF.⁴ In this report, I outline the process by which we crafted the Phase I output of the GNP – a near-future, illustrated SF novel called *Fever Medicine* – and how such a project might be undertaken differently the next time round. I conclude by identifying some plans for its use.

Developing the Illustrated Novel

Of course, one might at the outset question why we thought it useful to develop an illustrated novel. First, it is claimed that the visual aids learning,⁵ and this is

* Lecturer in Regulation & Risk, University of Edinburgh; Deputy Director, J Kenyon Mason Institute for Medicine, Life Sciences and Law; Research Associate, Innogen Institute; Joint Editor-in-Chief, Medical Law International.

¹ Regulation means that collection of norms, rules and practices that influence actor behaviour in a given field, and it includes the law and legal instruments, where applicable.

² M Brake & R Thornton, 'Science Fiction in the Classroom' (2003) 38 *Physics Education* 31- 34, quoting Greenfield at 34.

³ Graphic and Novel: Law, Bioethics and Medical Futures: <<http://masoninstitute.org/our-research/#G&N>>.

⁴ For more on this, see S Harmon, 'Not Foresighting, Not Answering: Using Graphic Fiction to Interrogate Social and Regulatory Issues in Biomedicine' in T Giddens (ed.), *Graphic Justice: Intersections of Comics and Law* (London: Routledge, 2014), forthcoming.

⁵ G Yang, 'Graphic Novels in the Classroom' (2008) 85 *Language Arts* 185 - 192.

particularly so where science is implicated.⁶ Second, it is claimed that graphic narratives can promote traditional literacy and critical thinking through a rich variety of story-types.⁷ Third, it is claimed that literature generally is a useful and interesting platform for engaging with publics about socio-ethical issues around innovation.⁸ Accepting these claims, graphic narratives might also be used to promote an appreciation of science and law and their interrelationship, and to do so for audiences not normally reached by traditional academic publications. Our ambition within the GNP was to publish a full colour and visually stimulating, digital and hardcopy SF story which engaged with a range of contemporary legal and ethical issues around the life sciences innovation and public health. The following paragraphs articulate how we achieved that objective.

Fever Medicine proceeded as an exercise in scenario-building, which drew on multidisciplinary encounters. The first was a roundtable workshop attended by Edinburgh-based experts from science, industry, social science, ethics, law, and illustration. Using an open format, we explored current scientific capabilities, trajectories and ambitions, technical hurdles to shared ambitions, business models and industry challenges, ethical concerns, and the role of regulation. The second encounter was a project-team tour of the new MRC Regenerative Medicine Centre, where we talked informally with scientists, facility users, and science communication experts. This visit proved particularly useful to the artists. The insights gleaned from those events informed our ‘world-building’.

In crafting the world of Edinburgh 2050, I drew on existing scenario-building scholarship from the field of synthetic biology.⁹ Consideration was given to driving forces, major uncertainties, and primary actors. Driving forces are those social and technical phenomena that are in flux and rapidly advancing as at the time of writing. Such phenomena were used to help shape the characters’ perspectives and experiences. The driving forces taken into consideration were:

- Technology Convergence: DNA sequencing and synthesis technologies will advance, and will increasingly integrate with information and communication technologies.
- Popularisation and Commercialisation: Bioscientific knowledge will progress and pressure around associated commercial activities will increase.

⁶ J Trumbo, ‘Visual Literacy and Science Communication’ (2000) 21 *Science Communication* 379 - 391.

⁷ M Mooney, ‘Graphic Novels: How They Can Work in Libraries’ (2002) 21 *Book Report* 18; G Schwarz, ‘Graphic Novels for Multiple Literacies’ (2002) 46 *Journal of Adolescent Adult Literacy* 262 - 265; L Grossman, ‘Singing A New Toon’ *Time* (NY, 25 August 2003) 56; S Krashen, *The Power of Reading: Insights from the Research* (Libraries Unltd 2004).

⁸ M Stern, ‘Jurassic Park and the Moveable Feast of Science’ (2004) 13 *Science as Culture* 347-372; R Berne, ‘Science Fiction: A Portal to the Ethics of Nanotechnology’ in L Pin et al (eds), *Nanoethics: Examining the Societal Impact of Nanotechnology* (Wiley 2007) 10.

⁹ S Aldrich, J Newcomb and R Carlson, ‘Scenarios for the Future of Synthetic Biology’ (2008) 4 *Industrial Biotech* 39.

- Consumption: Energy demands will rise, resources will dwindle, and human-generated environmental stress and climate change will impact on living arrangements and food security.
- Growth: Growing and aging populations, combined with growing infectious disease threats and sharper divisions between haves and have-nots, will create untenable pressures on national health systems.

Major uncertainties are phenomena of uncertain trajectory at time of writing, and so permit broad scope for creativity. Some of the uncertainties that I identified and used to help shape the narrative included the following:

- the developmental trajectory and ultimate capabilities of regenerative medicine;¹⁰
- whether regenerative medicine will ever fulfil its promise;¹¹
- whether intellectual property law will shift and transform approaches to science;
- whether access to certain biotechnologies will become restricted; and
- whether geopolitical realities will realign and dramatically alter security concerns.¹²

The idea of primary actors refers to who we might anticipate will be first-movers in the world of 2050. In this regard, an arguably conservative approach was adopted with the result that:

- national governments were assumed to be unevenly subservient to private multinational entities, including research institutions;
- open science researchers would become more strident as social inequalities sharpened; and
- bio-activists and bio-terrorists would be relevant.

Of course, the caveat is that it is near impossible to accurately predict the evolving preferences of these first-movers; this again then offered scope for creativity.

Given the nature of the output, consideration was also given to the role of graphics. The text/image interaction in *Fever Medicine* was shaped by both the time that the artists could invest and our (in)experience with comic design/layout. This pushed us toward an ‘illustrated’ rather than a ‘graphic’ novel, though an illustrated novel with more images than is common for the genre. But in keeping with the genre, the text

¹⁰ M Hopkins et al, ‘The Myth of the Biotech Revolution: An Assessment of Technological, Clinical and Organisational Change’ (2007) 36 *Research Policy* 566.

¹¹ L Orsenigo and J Tait, ‘Special Issue on Evolution of the Life Science Industries’ (2008) 10 *International Journal of Biotechnology* (Special Issue) 389-517 at 404.

¹² J Mittra, ‘Life Science Innovation and the Restructuring of the Pharmaceutical Industry: Merger, Acquisition and Strategic Alliance Behaviour of Large Firms’ (2007) 19 *Technology Analysis and Strategic Management* 279-301; J Mittra, ‘Impact of the Life Sciences on Organisation and Management of R&D in Large Pharmaceutical Firms’ (2008) 10 *International Journal of Biotechnology* 416-440.

preceded the images, specifying the story world and giving direction to the features and elements of the images. The images, for their part, were meant to make the story and its characters come to life; by depicting the world and its people rather than abstract ethical or legal issues, the images give greater context to the city, the characters, and their capabilities. And while some of the scientific kit was faithfully depicted, the imagery is more in the nature of ‘art-science’ than ‘science-art’.¹³

The result is a magnificently illustrated SF story about illness, ambition, ambivalence, exclusion, injustice, and reconciliation. Within the context of a richly rendered postmodern dystopia characterised by darkness, uncertainty, and morally ambiguous characters, *Fever Medicine* tries to articulate risks and highlight conflicting values and expectations, engaging with current ethico-legal issues such as access to medicines, regulatory burden, uncertainties around regulatory demands, and the role of commercialisation in biomedical science, while simultaneously explaining in an accessible manner the scientific method and the current state of regenerative medicine. Ultimately, *Fever Medicine* is an exercise in ‘Mode 2’ knowledge production whereby the arts are not used to transmit science to publics for the purpose of assembling those publics for the benefit of science, but rather to *contextualise* science and to render it more accessible and so more *accountable* to publics.¹⁴

Conclusion

Whereas the development of *Fever Medicine* was largely internal facing in its knowledge exchange, it is our hope that it might be used by secondary and post-secondary educators interested in exploring techno-ethico-legal issues, or interested stakeholders desiring a tool to assist in their deliberations, or science communicators in bespoke participative events. In addition to showcasing the creative talent of the artists, it might challenge ideas and encourage discussion. To this end, a range of classroom and public uses will be designed in cooperation with knowledge-exchange practitioners and users, the ultimate purposes of which are to: expose different cultures to one another in ‘controlled’ engagement environments; encourage the sharing of ideas and the examination of assumptions; and open up minds and debates around science trajectories and decisional frameworks. In this respect, the GNP draws inspiration from a range of art-science experiments.¹⁵ In short, it is a deliberative tool, aimed at posing and discussing questions, not generating answers to be offered to publics. It is *publics* that must come up with the answers.

¹³ Science-art is used to increase the accessibility of complex or technical information, or to give greater depth to the transfer of personal experiences or observable phenomena. The art is expected to reflect or augment reality so that it is more comprehensible. It is aimed at aiding rather than challenging the audience. Conversely, art-science is science that subordinates to the art; the primary driver is storytelling, creativity, or provocation as opposed to the communication of accurate science. The art need not precisely reflect, and the artist is not constrained by, current technical realities.

¹⁴ A Barry and G Born, ‘Logics of Interdisciplinarity’ (2008) 37 *Economy Society* 20-49; G Born and A Barry, ‘ART-SCIENCE: From Public Understanding to Public Experiment’ (2010) 3 *Journal of Cultural Economy* 103-119.

¹⁵ See ACE Program <<http://escholarship.ucop.edu/uc/ace>>; Art/Science Fusion Program <<http://artsciencefusion.ucdavis.edu/MissionStatement.html>>; ASCUS Art Science Collaborative <<http://ascus.org.uk/>>; SymbioticA <<http://www.symbiotica.uwa.edu.au/>> all accessed 1 December 2013.