

## **Questioning Hype, Rescuing Hope? The Hwang stem cells scandal and the reassertion of hopeful horizons:**

For 'Science as Culture' – special issue

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**This is a preprint of an article submitted for consideration in *Science as Culture* 2008. Process Press. Science as Culture is available online at: <http://journalonline.tandf.ac.uk/>**

### **Introduction: the promise of stem cell research**

Heaven, we are told, is a place where illness and suffering are no more. Today scientists claim to have taken mankind one step closer to a disease free utopia right here on earth. Disease starts in cells. Imagine what we could do if every type of cell in the human body could be replicated, and damaged ones replaced. That is the promise of these men from Korea. (*Channel 5 News*, 12 February 2004)

The news report quoted above was accompanied by choral music and images of a cell being manipulated under a microscope. As the voice-over referred to 'illness and suffering' viewers were offered a glimpse of what might await any of us, or our loved ones, in the journey from life to death. An ill baby was displayed, then a sick child gazing at the camera with large eyes, and finally an elderly woman, struggling to walk with a Zimmer frame. Each image was framed through the lens of the cell itself. [See Fig 1]. As viewers were invited to 'Imagine what we could do...' with stem cells, the images of suffering were replaced by a scene of high-tech surgical treatment. Finally the bulletin cut to the press conference held by 'these men from Korea' announcing their scientific breakthrough in cloning human embryos for stem cell research.

No parody seemed intended in this bulletin. In many ways it was just an extreme example of what counted as 'news reporting' about embryo stem cell science throughout the first five years of the 21<sup>st</sup> century. Such utopian optimism seemed even more justified when the South Korean team went on to announce, in May 2005, that they had established stem-cell lines matched to individual patients. At the end of 2005, however, the 'promise' from the Korean research began to disintegrate. Allegations emerged that the claimed 'breakthroughs' were fraudulent. How did this affect the representation of the stem cell research enterprise – what happened to the utopian visions of a disease free future the research had been used to underpin?

[Insert Fig 1 near here – image of child. Caption: The ill child, displayed on *Channel 5 News*, framed through the lens of the cell. The choice of images of

black and white patients, as well as the range of ages, helps to underline the idea that this technology could provide treatments for everyone.]

This article explores how the Korean 'breakthroughs' and subsequent scandals were used in debates about stem cell research as they played out in the UK press, radio and TV news. It highlights how the initial announcements of scientific advances were used to promote a positive image of embryo stem cell research and examines what happened when those advances later proved illusory.

The analysis is located within a media studies literature concerned with the role of the media in lobbying for policy changes and in shaping public debate (Eldridge et al., 1997). It is also located within the growing literature on the sociology of expectations. This strand of sociology is founded on the observation that the implications of any scientific/medical developments are not predetermined by the technological 'facts' but rather that 'the future of science and technology is actively created in the present through contested claims and counterclaims over its potential' (Brown, Rappert & Webster, 2000:5). From this perspective, analysts need to explore 'how the future is mobilised in real time to marshal resources, coordinate activities and manage uncertainties' (Brown and Michael, 2003:2). The point is that expectations are performative, they help to set priorities and attract investment, and hence stabilise future scripts and increase the likelihood of a particular future being bought into being. This fundamental observation underpins studies examining how competing versions of the future are promoted through both action and language in relation to innovations ranging from developments in the internet (Wyatt, 2004) to modernisation initiatives in local government (Llwelllyn, 2001). Work under this rubric includes looking at infrastructures, investment and regulation issues as well as examining discursive practices such as metaphors and narratives (see Brown et al, 2000; Deuten, 2000; Wainwright et al, 2006, Wyatt, 2004).

This article does not simply look at media framing and journalists' assertions, it particularly focuses on the reported statements of scientists and policy makers. Key players include scientists (e.g. Miodrag Stojkovic and Alison Murdoch involved in creating the first cloned human embryo in the UK), representatives from science organisations (e.g. the Medical Research Council) and regulatory and policy making bodies such as the Human Fertilisation and Embryology Authority [HFEA] or the House of Commons Science and Technology Committee. Statements from such key players are scrutinised not for what they 'represent' about the speaker's beliefs, but for what they 'do' – especially how the statements frame the present in order to enact a future (Wainwright et al., 2006, 2055).

I examine how such 'expert talk' attempted to set expectation (and manage disappointment) during three crucial periods in the recent history of the stem cell research enterprise. These three periods are typical of the cycles often involved in any innovation process:

- Phase 1: An initial period of visionary 'promise' which sets the foundations for exploring the potential of the innovation
- Phase 2: The moment(s) of 'breakthrough' during which 'promise' is seen to have been (at least partially) fulfilled and clear deliverables seem to have been identified

- Phase 3: Periods of setback and disappointment – such as when dramatic incidents of failure or fraud are exposed. This often then leads to realignments and new pledges, and the cycle starts again with some adjustments.

In the case of embryo stem cell research in the UK there are clear episodes which correspond to each of the above periods. The year 2000 – with the release of the Donaldson report - was a period of visionary promise-making during which a public debate was enacted and legislation was prepared to enable the use of embryos in stem cell research. Early 2004 through to summer 2005 offered ‘breakthroughs’ in the form of the South Korean achievements (and a cloning of a human embryo in Newcastle in the UK). By the end of 2005 and into 2006 however, a major potential setback emerged as the South Korean work was exposed as fraudulent.<sup>i</sup> This article examines each period in turn, drawing on statements made in press releases, assertions in media reports, letters from scientists to newspapers, guest-authored articles (where experts make direct interventions into the press) and statements made by experts interviewed on TV news or radio 4’s *Today Programme* (a flagship morning news programme with a large audience among policy-makers).

### **Phase 1 - Visionary Promises: the rhetoric of hope in 2000**

The need to ‘mobilise the future’ was starkly illustrated in the debate surrounding embryo stem cell science from the very beginning. The first major public foray in the PR battle in the UK was in the year 2000, when the Donaldson report was released. This report recommended expanding the ways in which embryos could be used to allow for stem cell research. It also suggested that the UK should permit the creation of cloned human embryos for such work. After intense lobbying, extensive briefing of journalists and debate in both the House of Commons and the House of Lords, the Donaldson recommendations passed into law.

During this period it was imperative to conjure up visions of the multiple benefits that might spring from embryo stem cell research in order to encourage financial, social and physical input. Investment was needed from *financiers* who could provide funding, from *policy makers* who could establish a conducive legislative context, from *citizens* who needed to accept the ethical/financial risks and from *embodied individuals* (e.g. women providing eggs or patients supplying themselves both as campaigners presenting a ‘human face’ to the research and as potential clinical subjects). Such investment had to be sought in the face of competition for resources and opposition from many interest groups, most powerfully those who object to the use of embryos for research (Williams et al., 2003).

A fierce PR battle got underway in 2000. This included coordinated press releases from leading science bodies (such as the Medical Research Council [MRC]) and patient’s groups (such as the Parkinson’s Society).<sup>ii</sup> Key support was also provided by international celebrities (such as the superman actor, Christopher Reeves, from the US) (see author name#, this volume). There was also an explicit attempt to enrol

science correspondents 'on side'. Looking back on his own role, Tim Radford, science editor for the *Guardian*, recalls a sense of being courted to work with scientists to promote embryo stem cell research. He also summarises what a 'good story' stem cell research was from a journalists' point of view. 'I cheerfully plead guilty to the allegations of hype', he commented, but 'You don't grab headlines by describing embryo stem cell research as an expensive laboratory based technology guaranteed to lead to many years of frustration and small flashes of enlightenment'. In retrospect, he can see that science journalists became 'willing co-conspirators in the great embryo stem cell conjuring trick.' However, the story was irresistible:

Embryo stem cell research looked like a very good story: good in the sense that it seemed as if it could save lives and halt hideous degeneration; good in that it could call upon images of celebrity victims like Christopher Reeve and Muhammad Ali [...], good in that it seemed to provoke a reflex denunciation for the Catholics, the US religious right [...]. And of course, it offered a real debate. [And] here was a story that had to be told before it happened, or it might never happen. (Tim Radford, speaking at the 'Talking Embryos' conference, Cambridge University, 5 May 2006, my emphasis)

It was during the initial period of 'visionary promise-making' in 2000 that I and my colleague, Clare Williams, became fascinated by the way the story was being 'told before it had happened'. We examined the media reporting of the Donaldson report and the subsequent parliamentary debate, paying close attention to the way the controversy was structured and the type of future-orientated claims made by protagonists of both sides of the debate (see Kitzinger and Williams, 2005 for a full report of our qualitative and quantitative research methods and our findings). Rather than repeating the research here, I simply want to summarise some of the key points which help to set the scene for the developments that were to follow.

Our analysis of the coverage during 2000 highlighted how readers and viewers were invited to identify with the sick who, it was pledged, would be treated/cured by such research. Proponents of embryo stem cell research sought to harness personal fears and yearning. Diseases of aging that might affect 'anyone' topped the list – Alzheimer's and Parkinson's being commonly discussed. The scientists and policy makers promoting embryo stem cell research also talked of obligations to our children and 'future generations' and offered the certainty of future treatments/cures. One MP's declaration, for example, that embryo stem cell research should be allowed because: 'Future generations should not *needlessly* be condemned to a "living hell"' (*Guardian* 20 December 2000, my emphasis) is clearly based on an assumption that such suffering is unnecessary because a cure can be found.

Proponents of embryo stem cell research also employed the language of universal human good; indeed, often a global reach to 'all mankind' was implied with all the moral authority that suggests. The future offered through a pursuit of embryo stem cell research was presented as not only realistically possible, but also as morally imperative. Such appeals failed to address likely global inequalities in the distribution of risks and benefits in developing such treatments. There was also little acknowledgment that, for many parts of the world, 'diseases of aging' such as Alzheimer's are not the major threat to health.

Alongside this, our work highlighted how an idealised future was brought into the imminent present during 2000 with the predictions of treatments 'within 5 to 10 years', the juxtaposition of words such as 'prospect now' and the positive use of 'can' and 'could' to describe the medical promise of embryo stem cell research. (Words such as 'can' and 'could' were employed much more often than more uncertain terms such as 'may' or 'might'). Even the very term 'therapeutic cloning' itself helped to frame the research as potential medical treatment rather than an experimental science (its projected outcome being woven into the very label itself).

We also explored the centrality of notions such as 'potential' and the use of concepts such as 'hope'. For the proponents of embryo stem cell research, 'potential' was a quality attached to the stem cell research rather than to the embryo and 'hope' allowed scientists who might not confidently 'predict' particular outcomes to invoke positive visions of the future, while at the same time allowing for an escape clause. The term bridged the gap between wishful thinking and present reality.

Hope was not identified as a human aspiration or emotion, but instead offered as a basis for claims-making. Over and above this 'hope' was presented as a forceful motivator. The 'right to hope' and the 'power of hope' was a central conceptual pillar making resistance to such embryo research appear morally reprehensible. The complexity of 'hope', highlighted by disability activists, was marginalised. Also, 'hope' was only selectively deconstructed - when the term was applied to *adult* stem cell research it was dismissed as 'mere hope' in order to justify investing 'real hope' in *embryo* stem cell research (Kitzinger and Williams, 2005).

Re-visiting this analysis six years on allows me to explore how the debate has played out over the intervening years in the face of different news events, laboratory developments and shifting alliances and oppositions. It is these shifts which are the focus of the next two sections of this article as I examine phase 2 ('breakthroughs') and phase 3 ('setbacks') in the story of embryo stem cell research.

## **Phase 2 – Breakthroughs and landmarks: the symbolic significance of the Korean announcements 2004/5**

In February 2004 Prof Hwang and his colleagues published a groundbreaking paper in *Science* announcing that they had cloned 30 human embryos and harvested stem cells from one of them. This was followed, in May 2005, by a further announcement that they had established 11 stem-cell lines derived from the skin cells of individual patients. (On the same day, a UK team – involving Alison Murdock and Miodrag Stojkovic - revealed that they had succeeded in cloning an embryo).

These announcements were the pinnacle of the 'Breakthrough phase' in this particular innovation in the early years of the 21<sup>st</sup> century. As one headline declared: 'The future is here - how theory has grown into a virtual reality' (*The Times*, 20 May 2005). Such moments are crucial to the construction and maintenance of futures. As Brown argues:

Rhetorical representations of the future are no doubt powerful animators of action and an essential feature of mobilisation. But at some point it must

become evident that the imagination has taken on a solid material and substantive form. (Brown, 2003, p9-10)

The breakthroughs were very timely. So timely for some, in fact, that if they had not happened one might have wanted to invent them! The combined achievements in South Korea (underlined by the complementary, if slightly belated, success following in their wake in the UK) were presented as the first steps towards a promise fulfilled. They represented hope 'made flesh'. Crucially the South Korean breakthrough in moving from a cloned embryo to patient-matched stem cell lines reinforced the 'bench to bedside' discourse which enacts a particular present in order to realise a particular future. (Wainwright et al., 2006, 2055)

All the persuasive devices evident during the earlier period of promise in 2000 were clearly evident in the 2004/mid 2005 breakthrough phase. The achievements of Hwang and his team were greeted with headlines such as 'First human clone success "will cure incurable"' (*Sun*, 13 February 2004); 'Could human cloning rid world of diseases? Embryos bring hope to millions' (*Daily Mirror*, 13 February 2004) and 'The cloning revolution: Advance heralds 'personalised medicine'' (*Guardian*, 20 May 2005).

The public were informed that 'Patients can look forward to having transplants of cells exactly matched with their need' (Suzi Leather, HFEA, *Daily Mirror*, 13 February 2004). One news bulletin introduced viewers to a woman with Parkinson's accompanied by the confident assertion that this research 'will help people like her'. Another opted to use a celebrity patient, opening with a recycled clip (from 1999) of Michael J Fox (the actor with Parkinson's). 'If we all do everything we can to eradicate this disease', he declared, 'in my 50s I'll be dancing at my children's weddings' (*ITV News*, 12 February 2004).

Invitations to identify with potential beneficiaries of stem cell treatments were combined with assertions that, if stem cell research works, 'we're all going to benefit' (*BBC News*, 19 May 2005) as well as pronouncements of global promise. Prof Hwang claimed he wished to 'cure the world of some of the worst diseases in the world' (Radio 4, *Today Programme*, 12 February 2004). The Chief Executive of the Medical Research Council [MRC] in the UK declared that stem cell research must be brought 'to the service of mankind', and pursued as 'an altruistic obligation to the health of the world' (Colin Blakemore, Radio 4, *Today Programme*, 20 May 2005).

However, 2004/5 was not just 'more of the same', this period was also characterised by particular rhetorical devices becoming foregrounded, including:

- the imagery of a 'landmark' and reification of a destination
- hyperbole and retrospective qualifications
- the discourse of vindication and urgency
- caution framed through certainty

**The imagery of the journey:** Prof Hwang's research was feted as 'a landmark achievement' (Radio 4, *Today Programme*, 12 February 2004), 'a great step forward'; (Radio 4, *Today Programme*, 20 May 2005), evidence of 'giant strides' (*ITV News*, 19 May 2005) and a 'milestone' (*Telegraph*, 20 May 2005). It confirmed that cures were 'on the horizon' (*BBC News*, February 2004; *BBC 4 News*, February

2004). The metaphor of the journey was used to reify the destination. Success in cloning human embryos was identified as ‘the beginning of a long, long journey [...] which will help us one day, definitely help us to cure diseases’ (Stojkovic, speaking on *BBC News*, 19 May 2005). The journey may be arduous, but the destination exists; it only has to be reached through fortitude and determination and, of course, continuing investment. The breakthroughs were presented as reason to re-energise the pioneering spirit and confirm commitment to the mission.<sup>iii</sup>

**Accelerating hyperbole and retrospective qualifications:** Given the promises made for stem cell research 4 or 5 years earlier, it was sometimes a struggle to find suitable hyperbole. During this period journalists, and the scientists they interviewed, had to reach for ever more emotive imaginings (as demonstrated in the bulletin described in my opening paragraph). Interestingly, previous pronouncements (such as those made during 2000) began to be subtly downgraded. Such down-gradings retrospectively acknowledge that past assertions were not quite real. They began to be described as merely ‘speculative’ or ‘hypothetical’ in order to contrast that with the current state of affairs. One news anchor, for example, declared that: ‘Now there is the *real* prospect of a treatment, maybe even a cure, because of the research the Korean scientists have done.’ (*ITV News*, 12 February 2004, my emphasis). Others informed audiences that the breakthroughs showed ‘what we thought was theoretically possible actually *is* possible’ (Radio 4, *Today Programme*, 12 February 2004) or that what was once ‘only a theoretical possibility’ had now become ‘a realistic option in the not too distant future’ (Murdoch speaking on Radio 4, *Today Programme*, 20 May 2005). Such statements conveniently ignore the fact that scientists did not talk in terms of mere ‘theoretical possibility back in 2000.

**Vindication and a new sense of urgency:** At the same time as the Korean breakthroughs served as another platform for pronouncements of hope, they also quite explicitly served to justify past optimism and the decisions such optimism informed. The Chair of the UK’s House of Commons Science and Technology Committee welcomed the 2004 South Korean breakthrough as ‘a complete vindication of the [UK] Government’s position in allowing stem cell research’ (Ian Gibson MP, *Daily Express*, 13 February 2004).

Indeed, the breakthroughs not only vindicated past decisions, they also gave impetus to renewed efforts. The work of Hwang and his team underwrote ambitious plans for international cooperation. These were given material form in South Korea through the Stem Cell Hub publicised under the banner: ‘Hope of the World - Dream of Korea’. [Insert Fig 2 – Stem Cell Hub image - near here] The South Korean successes were also explicitly used to justify and underwrite parallel or competing research efforts in other countries. On the one hand, the Korean achievements were claimed as *international*, drawing on and contributing to *cross-national* networks and benefiting science *world wide*. On the other hand, the breakthroughs were also used to assert *national* priorities. Suzi Leather, head of the HFEA, used announcements of the Korean achievements to emphasise that such work would be welcomed in the UK (Radio 4, *Today Programme*, 12 February 2004). Biotechnology entrepreneur Sir Chris Evans greeted them by calling for further UK investment. ‘Countries are forging ahead’ he declared ‘whilst we ponder our greatness in this field. I still believe we can be the best and lead the world in this field if we move fast and decisively.’

(*Telegraph*, 20 May 2005). In the U.S. commentators also used the Korean breakthrough to make statements about what should be happening in their country. An editorial in the *Washington Post* cited the 'impressive breakthrough' in South Korea as a reason to liberalising policy on stem cell research in the US (22 May 2005).

**Words of caution, framed through assumptions of certainty:** Alongside celebrations of the 'impressive' developments in the field, there were, however, some words of caution. In fact, some effort to temper expectations was *more* evident in 2004/5 than it had been back in 2000. Thus, on the one hand, news bulletins could show shots of a woman shaking with Parkinson's accompanied by the assertion that this research 'will help' people like her; on the other hand they cautioned that no one should 'misunderstand' this as meaning that it was yet time to talk to their doctor. However, even calls for caution were usually framed positively as declarations that, for example, 'no one can say yet when the breakthroughs will happen' (*BBC News*, 19 May 2005) or 'All that is in the future' (*ITN News*, 19 May 2005). These statements are, in one way, a admonition against premature expectation. At the same time, however, they actually assert the certainty of an eventual positive outcome, as 'the breakthroughs will happen' and all this 'is' in the future. It would only be a matter of time, such expectations would be fulfilled.

The above analysis shows how the Korean work was held up as a significant illustration of the 'real promise' of embryo stem cell research in general and therapeutic cloning in particular. The breakthroughs provided evidence of a return on investment and a vindication of (or reason for) a liberal legislative climate. What happened then, when much of this work became discredited? The next section examines responses to South Korean scandals that emerged at the end of 2005 and into 2006.

### **Phase 3 - Setbacks and realignment: the collapse of the South Korean claims 2005/6**

At the end of 2005 Hwang's claims about what he had achieved began to disintegrate. First there were concerns about how he had obtained women's eggs. At this point, although scientists expressed concern about the process, many reaffirmed the value of his work nonetheless. The allegations of ethical misconduct, however, were quickly followed by revelations suggesting that Hwang or his team had faked data. These revelations at first seemed quite devastating. They certainly offered easy ammunition to long term critics. For example, David King, director of Human Genetics Alert, declared that Dr Hwang's lies showed that 'therapeutic cloning was a mirage based on scientific deceit: a technological fantasy' (*Independent*, 11 January 2006) and Josephine Quintavalle from the pressure group 'Comment on Reproductive Ethics' [CORE] called for a 'thorough investigation' into all human cloning claims and a re-assessment of 'the hype' (quoted in *Daily Mail*, 24 December 2005).

The Hwang scandal even seemed to undermine the optimism of long term supporters of embryo stem cell research, at least for a time. Alison Murdoch (involved with cloning the human embryo in the UK) commented: 'We are back on the starting line' (*Daily Mail*, 24 December 2005), while the journal '*Nature*' declared:

'Researchers now face a long slog to rebuild the foundations of their field,' (*Nature*, 20 December 2005). Headlines from this period included examples such as: 'The hype over stem cells has gone too far' (*Independent* 29 December 2005) and 'Cloning Scandal: scientists forced back to the drawing board' (*Observer* 1 January 2006). The Head of the UK's MRC summed up the views expressed by many: 'it is a terrible, terrible setback; not just for this field, not just for Professor Hwang's team, not just for South Korea and their efforts in science and technology, but for science as a whole' (Colin Blakemore, *BBC1 News*, 23 December 2005).

However, it is noticeable that within weeks, or even days, public statements from scientists and policy makers shifted to (re)create a more optimistic framework for understanding the crisis. Hope was in some ways 'rescued' simply by repetition of the standard discourse of promise resolutely attached to the abstract ideal of 'therapeutic cloning'. For example *The Times*, even while reporting the bankruptcy of the promises offered by Hwang's research team, simultaneously reasserted the promise of 'therapeutic cloning' itself.

[The scandal is] a severe setback for therapeutic cloning, *which promises new treatments* for conditions such as diabetes, paralysis and Parkinson's disease by providing cells that would not be rejected by patients' immune systems. (*The Times*, 11 January 2006, my emphasis)

Hwang himself also explicitly reasserted the promise of stem cell research even as he admitted some of the problems with his research. In his humiliating televised apology it is notable that Hwang emphasised his great sorrow at creating 'disappointment' – not for creating false hope. 'I sincerely apologise' he said 'for creating shock and disappointment' (*Observer*, 1 January 1, 2006). Although, of course, disappointment can not exist without hope – it is his failure to *deliver* that is presented as the problem. In fact, Hwang remained defiant about the future: 'patient-specific stem cells belong to South Korea', he declared, 'and you are going to see this' (quoted in *Observer*, 1 January 2006).

The metaphor of the journey, evident in the breakthrough phase, was also employed to good effect in the setback phase. Chris Shaw, part of the team who created Dolly (and head of a research group holding a human cloning licence) presented the Hwang scandal as akin to a faked photograph showing Hwang astride a famous landmark. He declared:

It was as if Dr Hwang had sent us a picture of him on top of Everest, but it happened not to be Everest. He lied to us about that and Everest is still there to climb. (Professor Chris Shaw quoted in *Guardian*, 11 January 2006)

The fakery is here attributed to the *representation* of the fact (Hwang having reached the claimed destination), not the 'fact' or 'goal' itself. The use of concrete landmark imagery/metaphor suggests that treatments from stem cells 'exist' in rather the same way that the peak of Everest exists, it is simply a challenge to be met, a mountain to be scaled.

Hope, and hence the on-going desirability of investing in embryo stem cell research, was also rescued through a rapid series of boundary management activities (Gieryn 1999). Boundary management work revolved around:

- severing working relations,
- drawing national distinctions
- highlighting diverse stem cell research methods.

**‘Divorcing’ working relations:** At the end of 2005 the scientists who had once wooed Hwang as a collaborator, now distanced themselves and their work from anything to do with this pariah. Hwang’s US collaborator, Gerald Schatten, publicly severed all ties, and a prominent UK team (including Ian Wilmut and Chris Shaw) cut short attempts at developing closer working relationships declaring that their collaboration was ‘over before it had even started’ (Chris Shaw quoted in *Telegraph*, 13 January 2006). The line was thus clearly drawn between good scientists and the maverick (see Haran, 2007 for how this was achieved with previous cloning ‘mavericks’).

**Asserting national distinctions:** Alongside such high profile ‘divorce’, scientists drew boundaries of *nation*: South Korea was now isolated as a unique cultural context, with specific nationalistic forces or social conditions which were irrelevant to the UK (Chekar and Kitzinger, 2007). Indeed, in some ways the Korean debacle even became an opportunity to call for renewed hope, investment and efforts within the UK. (Just as the previous Korean ‘successes’ had been used to call for this too). Now, the embryo cloned in the UK in 2005 could be relocated as a ‘world first’ and the next step (the conquering of Everest/creation of patient-matched lines) might also be claimed as a UK achievement.

The value of the *UK* science regulatory system was also once again fore-grounded. Several policy makers and scientists (both in the UK and internationally) used the South Korean debacle to emphasise that the UK had developed an ideal policy context in which ethical stem cell research could flourish (see Wilmut quoted in the *Independent*, 25 November 2005; Minger quoted in *The Times*, 25 November 2005). Indeed, the HFEA was held up as offering a ‘far-sighted’ model for the rest of the world (Radio 4, *Today Programme*, 1 June 2006).

**Distinguishing the use of ‘spare’ IVF embryos and marginalising cloning:** Perhaps the most significant form of boundary management, however, involved drawing distinctions between stem cell research based on cloning techniques and that pursued through the use of ‘spare’ IVF embryos. Back in 2004/5 the cloning successes announced in South Korea were often claimed as evidence of the progress of embryo stem cell research in general. When the South Korean claims collapsed they were re-positioned as a mere sideshow in the stem cell research enterprise. The Hwang scandal, declared one leading UK researcher, ‘is likely to have a minimal effect on stem cell biology per se and work in the field will continue. [...] cloning and stem cells are different things, [...] stem cell lines have been, and continue to be, made without using nuclear transfer (cloning).’ (Stephen Minger, *Independent*, 11 January 2006).

### **With the benefit of hindsight: viewing changing strategies in action over time**

The sort of strategies for rhetorically ‘rescuing hope’ outlined above did not fall into place instantaneously. The nature of the rhetoric is made all the more visible by the fact that it took a few days, or even weeks, to consolidate. It is interesting, to observe the shifting statements made by key figures over the first few weeks of the scandal. The Chief Executive of the MRC, Colin Blakemore, for example, originally failed to draw boundaries in his statement to the BBC in December 2005 – indeed he explicitly *generalised*. It is worth revisiting that quote: ‘It is a terrible, terrible setback’, he said, ‘not just for this field, not just for Professor Hwang’s team, not just for South Korea and their efforts in science and technology, but for science as a whole’ (*BBC1 News*, 23 December 2005). However, talking to ITV news the same day he suggested that although ‘This is a huge disappointment’ - ‘we must make sure that this disappointment doesn’t turn out to be a setback for this field of research’ (*ITV News*, 23 December 2005) and by the second week of January he was explicitly stating that the events had little implication for stem cell research as a whole and were, at most, a ‘temporary’ setback. Now he drew very clear distinctions and, in this way, maintained a hopeful narrative for stem cell research:

I think this is a very sad turn of events for South Korean science [...] [but] I don’t think it’s that serious for stem cell research [...], many researchers in this area are not involved in any way in nuclear transfer; there are many other areas of stem cell application from embryonic stem cells, not from cloned embryos but from ordinary embryos right through to adult stem cells for instance [...] I think it’s a temporary setback [...]. (Blakemore, Radio 4, *Today Programme*, 10 January 2006)

It was these sorts of rhetorical moves which underlay a series of articles penned by science correspondents across the UK in the last few days of 2005 and the first couple of weeks of 2006. A headline in *The Times*, for example, declared that the South Korean debacle had left the stem cell research enterprise: ‘Dented not destroyed’ (*The Times*, 11 January 2006). Similar views were expressed by some leading scientists who wrote guest pieces for the broadsheet press, scientists such as Steve Jones, Professor of Genetics at University College London and Trustee of the UK Stem Cell Foundation. Professor Jones made his views clear in a piece in his *Telegraph* article headlined: ‘Despite the humiliating setback in Korea over cloning, Steve Jones believes there will be a breakthrough before the end of the decade.’ (*Telegraph*, 3 January 2006)

Where the original breakthroughs had been mobilised to justify hope for the entire stem cell research enterprise, the scandal was isolated as justification for disappointment around just a few areas of work within a specific country. In the ‘setback’ period, both Hwang’s achievement and his fraud were belittled. As one science correspondent presented it: ‘One scientist’s feted work<sup>iv</sup> has been discredited, but human cloning was always a scientific sideshow. [...] His tarnished reputation closes a shabby sub-plot. It is not the end of the story.’ (*The Times*, 30 December 2005)

Such statements may, of course, be ‘true’ but the point is that different ‘facts’ become pertinent at different points in time to achieve particular aims. The truths outlined by embryo stem cell proponents in response to the 2005/6 scandals were

not part of the story in 2004 or earlier in 2005. Then, such ‘facts’ were not considered relevant or strategic. This can be further illustrated by looking more closely at an extract from the article in *The Times* quoted above. A couple of paragraphs from this article are reproduced in Box 1 :

Box 1

**‘The retreat of the clones’**

Mark Henderson, science correspondent

*The Times*, 30 December 2005

The Hwang affair is a setback, but it does not have any bearing on the potential of the wider field. This was true even before doubts began to surface about his work. Cloned embryos might be the ideal source of therapeutic stem cells, but they are not going to be a practical one for the foreseeable future. To create them, one must first have plenty of human eggs, and this raw material is in very short supply. Egg donation is complicated and risky for the donor, and there are insufficient quantities available to treat infertile couples, let alone to serve regenerative medicine. The idea there will be enough to treat Britain's 120,000 Parkinson's patients, let alone two million diabetics, with tailor-made clones is monumentally far-fetched.

Mainstream scientists are concentrating instead on common-or-garden ES cells, the kind that can be extracted from surplus embryos left over after IVF. These are what Ian Wilmut was talking about this week [...]. Wilmut might be renowned as the creator of Dolly, the cloned sheep, but he is well aware that the therapeutic promise of ES cells need not rely on cloning. Other options are going to bring medical benefits much sooner, and at lower cost. [...] this is where the immediate future of the field lies. Hwang's work is irrelevant to it.

The work achieved by Mark Henderson in this piece is multiple, and quite unlike anything written by this journalist, or most other reporters, in previous phases of the stem cell innovation cycle (the phase of ‘Visionary Promise’ or the ‘Breakthrough Phase’). Even the short extract reproduced in Box 1 contains striking inconsistencies with earlier reporting.

Although Henderson claims that Hwang’s work ‘does not have any bearing on the potential of the wider field’ and that ‘this was true even before doubts began to surface about his work’, one would not have known that from earlier reporting. Certainly no such caveats were included in this journalist’s reporting on the original South Korean breakthroughs – articles which appeared under the headlines ‘Scientists hail human stem-cell breakthrough’ (*The Times*, 13 February 2004) and

then 'Race to find new cures speeds up [...]' (*The Times*, 20 May 2005). It was only in December 2005 that Mark Henderson (along with many of his colleagues) started to retrospectively reposition Hwang's work. In the extract reproduced in Box 1 five crucial points are made:

- Therapeutic cloning is now presented as marginal whereas working with IVF embryos is repositioned as 'mainstream'.
- Therapeutic cloning is presented as 'impractical' for the 'foreseeable future'
- The risks of egg donation are highlighted (a risk notable by its absence in previous accounts).
- The mismatch between the number of eggs and the number of people with Parkinson's or diabetics is highlighted – and a vision of tailor-made clones for each one presented as 'monumentally far-fetched.'
- The question of cost is raised.

In many ways this list reflects the sort of critical briefings provided by groups such as Human Genetics Alert when they were challenging celebration of Hwang's breakthroughs back in 2004 (see [www.hgalert.org/pReleases](http://www.hgalert.org/pReleases)). Here, however, the same sort of information is used in *defense* of stem cell research – as a way of dismissing Hwang's work, and hence his downfall, as 'irrelevant' to the vast bulk of stem cell research. None of these problems were mentioned in the original breakthrough reporting. Indeed, Henderson's original reports emphasised how the South Korean research 'promises a new era of designer medicine [...] paving the way for growing spare part cells that are tailor-made for treating patients with diseases such as Alzheimer's Parkinson's and diabetes' (*The Times*, 13 February 2004). The only obstacles mentioned were the ethical dilemmas around using embryos or fears of reproductive cloning; issues of the risks associated with egg donation, the supply-demand mismatch and questions of cost were all ignored.

In addition to noting how risks were differently framed in the Setback period it is also worth noting the work performed by phrases such as 'far fetched' and 'foreseeable future' (fascinating phrases from a sociology of expectations perspective). 'Horizon scanning' and 'fore-sight' are respectable endeavours. Claims to literally 'see' the future, however, are hocus-pocus associated with fortune tellers, tarot cards and crystal balls. Scientists and policy makers talking of the 'foreseeable future' often use the phrase ostensibly to *negate* rather than to *assert* a future possibility. During the early years of 'visionary promise' the phrase was used to dismiss the possibility of *reproductive* cloning (this is '*not* possible for the foreseeable future') or to undermine claims about the potential of *adult* cell research (e.g. adult stem cell work will not generate practical benefits in 'the foreseeable future'). Often, such dismissals were used to *contrast* such practices with the potential of using embryos for stem cell research (e.g. see Sir Robert May, letter to *The Times*, 22 January 2001). References to the 'foreseeable future' thus are often used not just to *discredit* one type of future as *illusory*, but also, implicitly, to locate another as *plausible* in the 'seeable future' (without actually having overtly to claim that the speaker can really 'see' the future).

After the South Korea debacle, however, the notion of what was 'foreseeable' was sometimes adjusted. In the extract from *The Times* reproduced in Box 1 therapeutic stem cells from cloned embryos are (re)presented as not 'practical' for the

'foreseeable future' and the emphasis is shifted onto embryo stem cell research using IVF embryos – or embryos achieved through other means. In this sense the setbacks seemed to open up competition in the stem cell field.

Indeed, within a year of the scandal breaking, some scientists were prepared to declare publicly that the benefits of cloning research had been 'oversold' and, instead, promote alternative approaches. For example, when Austin Smith became director of the new Wellcome Trust Centre for Stem Cell Research he distanced his work from that which had been carried out in South Korea. He was concerned that, 'the whole field' of stem cell work might have been quite mistakenly 'tarnished by the scandal surrounding Woo-Suk Hwang' and was reported *challenging* the value of 'therapeutic cloning'. He was quoted suggesting that 'significant technical barriers' meant the patient-matched tissue 'may never be realised in practice' and 'there are real question marks about whether it has any utility at all'. Instead, he promoted research into basic understanding of ES cells and adult stem cells. (*The Times*, 18 December 2006). An intriguing 'clarification' appeared in the newspaper several weeks later. This read:

In a report on stem-cell research ("Cloning benefits oversold, says stem-cell scientist", December 18), an editing error might have left readers unclear as to the position taken by Professor Austin Smith, of the University of Cambridge. Professor Smith believes that the best therapeutic cloning research should be supported, and is opposed to the proposed ban on the creation of human-animal hybrid embryos. We are happy to set the record straight. (*Guardian*. January 31, 2007)

This brief item appeared, of course, just as a new phase of struggle emerged in the stem cell research debate, this time focussed on hybrid embryos. Headlines in the weeks and days preceding the publication of the 'clarification' had included: 'Scientists attack plan to ban 'hybrid' embryos *Guardian*, January 5, 2007; 'Hybrid embryo ban "would cost lives of patients"', (*Telegraph* January 5, 2007) and 'A chimera, or a monster mix-up?' (*The Times*, January 29, 2007). Clearly, navigating the future of stem cell research is a delicate enterprise.

## Conclusion

The trajectory of the stem cell research story offers a useful case study for the sociology of expectations. Three phases are clearly evident in just the first few years of the 21<sup>st</sup> century and these are typical of the cycles of hope-and-disappointment involved in any innovation. First there was the phase of 'Visionary Promise' (2000 onwards). Then there was the 'Breakthrough phase' (2004 to mid 2005) - when successes seemed to give concrete expression to all that hope. Finally, there was the 'Setback phase' (late 2005, early 2006) - when two key breakthroughs were revealed as problematic, and scientists/policy makers moved to both reassert hope and to readjust expectations and future directions. Recurring rhetorical themes are evident across all six years (e.g. appeals to imaginative identification and the asymmetrical construction of notions such as 'potential'). However, specific devices also come to the fore in different phases.

In the 'Breakthrough phase', landmark achievements were used to reify the future destination of stem cell research and retrospective qualifications were mobilised to downgrade past claims (as mere 'speculation'). There was also a new discourse both of vindication (previous decisions were evidently justified) and of urgency (progress in South Korea made efforts in the UK and the US even more essential). Although there were expressions of caution (people should not expect too much, too soon), these were framed through certainty about the inevitability of a final positive outcome.

The 'Setback phase' – once fraud was revealed – represented a potential rupture in the optimistic story of upward progress in embryo stem cell research. However, the call by leading scientists to 'make sure that this disappointment doesn't turn out to be a setback for this field of research' seems to have been heeded and public statements were geared toward rescuing hope for (at least part of) the embryo stem cell enterprise. During this phase proponents of embryo stem cell research reiterated the 'promise' of (at least some types) of research and made specific uses of the landmark metaphor to encourage continued support for the enterprise as a whole. They were also involved in sophisticated boundary management techniques: redrawing lines between scientists, between nations and between diverse types of stem cell research.

Methodologically, this case study demonstrates the value of tracking promise-making over time – especially through periods of change (around legislation), celebration (around breakthroughs) and setback (around fraud). Such a longitudinal approach allows one to revisit previously analysed texts, to consider what is *absent* as well as what is present and how particular terms may be (re)deployed during different phases of the debate (e.g. terms such as 'theoretically possible'). It allows one to examine how strategic talk shifts during different phases of the process of innovation and how diverse versions of the, even quite recent, *past* may be mobilised in accounts of the *future*

The analysis presented in this paper also, I hope, contributes to debates about so-called 'hype'. The concept of 'hype' is clearly an excessively simplistic way of characterising the complex processes involved in the *creation, management* and *repair* of hope. It is a blunt instrument which fails to address the shifting alliances and oppositions evident as key protagonists compete to assert different versions of hope (*from* what and *for* what), involving multiple fault lines (e.g. between those working with cloned embryos and those using 'spare' IVF embryos, or, latterly, hybrid embryos). It is also often a term applied without a clear sense of agency. Accusations of 'hype' are often simply used to scapegoat the media - absolving scientists and policy makers of any role in promoting an innovation (whereas, in fact, much of the 'hype' can be traced back to press releases and direct media briefings/interviews). In fact, allegations of 'hype' (against the media, or against scientists in competing fields) are part of the battle to control the future.<sup>v</sup> When discussing alleged hype, it is, therefore, important to acknowledge that it performs particular rhetorical work in discrediting those promoting alternative views of the future.

Hype is also problematic as an analytical category because it is very hard to define. Here I agree with Franklin (2001) as quoted in Brown, that 'it is a mistake to think we

can somehow factor out the hype [...] because it is precisely the importance of imaging a future yet to be that fundamentally defines the whole issue of the new genetics and society' (Brown, 2003, 17). It is nonsensical to try to compare the 'real future' with the 'imagined future' in the here and now. Such an enterprise is only possible retrospectively. More importantly, 'If we accept that anticipation is constitutive of value, then we logically cannot differentiate between our expectations of the biotechnologies, and what in reality those biotechnologies are, both in the present and in the future' (Brown, 2003, 17).

Before concluding, I would like to reflect on the legacy of the South Korean debacle for the popular image of stem cell research in the UK. The ramifications of the South Korean scandal continue to echo in regulatory systems, international collaborations and in the practice in laboratories and in science journals. However, as far as public debate in the mass media is concerned the Hwang crisis has already been resolved. The threat to hope posed by the South Korean debacle has been diverted. In fact it served as an opportunity for the UK science and policy-making community, to raise, but also to resolve fear (of maverick/deceptive science) into hope (of mainstream/honourable science). The promise of (at least some type of) stem cell work has remained intact. Indeed, in some ways it has been *underlined* rather than *undermined*.

Fig 1 and 2 [pictures]

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Acknowledgments: Thanks to the Social Contexts and Responses to Risk network (Grant Number: RES-336-25-0001) and the ESRC Centre for Economic and Social Aspects of Genomics (CESAGen) and to my colleagues: Joan Haran, Maureen McNeil and Kate O'Riordan.

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<sup>i</sup> More recently some advances as still attributed to Hwang, albeit any such discoveries were unwitting (e.g. 'Stem cell fraudster accidentally created first "virgin conception".' *Independent*, 3 August, 2007)

<sup>ii</sup> Some patients' organisations felt their disease was being recruited inappropriately. The Director of Research for the Alzheimer's Society, complained that 'The Alzheimer's Society is concerned that unrealistic hopes and expectations are being generated by Professor Liam Donaldson's report (17 August) and the regular media association of Alzheimer's disease with stem cell therapy.[...] This is a promising area of medicine that may revolutionise the treatment of many diseases in coming decades [...] [but] [f]or the foreseeable future, stem cell research is unlikely to lead to the development of effective treatments for Alzheimer's disease.' (*Independent*, 19 August, 2000)

<sup>iii</sup> The selection of 'landmarks' in any innovation process is not self-evident. It reflects a particular way of presenting the *past* and therefore the *future* of a developing technology. Human embryo cloning can, for example, be linked back to a story of Dolly the sheep, and/or with a story about the history of human reproductive technologies, such as IVF, which made women's eggs available to the lab. For discussion see 'What is cloning', chapter 2, in Haran et al., 2007)

<sup>iv</sup> Note how the work is attributed to 'one scientist' here, rather than to a 'team' of scientists. Individualising a scientist is associated with a maverick framing, whereas presenting an enterprise as 'team-work' lends legitimacy (see Haran, 2007)

<sup>v</sup> Such comments echo earlier examples where prominent scientist have criticised the over hyping of some forms of stem cell research. For example: Lord Winston caused a stir in 2005 when publicly warned against over hyping the potential of stem cell research. This led to headlines such as: 'Has stem cell research been over-hyped?' (*Guardian*, 8 September, 2005) and 'Have we been oversold the stem cell dream?' (*Telegraph*, 29 June 2005). The latter article carried the sub-heading: 'Cell therapy has been touted as the future of medicine but, finds Roger Highfield, doctors are uneasy about the media hype'. Here, 'hyping' is an activity assigned to *the media*, rather than scientists. This ignores the PR activities of stem cell proponents themselves. It also conveniently 'forgets' that even Lord Winston had been a strong proponent for the Donaldson recommendations in 2000 and had been cited then as suggesting that it would 'not be long before scientists can grow whole organs' (*Sun*, 17 August 2000).