Science, Patriotism and discourses of nation and culture: reflections on the South Korean stem cell breakthrough and scandals

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Abstract

Bio-technological research is refracted through, and has implications for, national and international economies, status, image and networks. Human embryo stem cell research, for example, brings potentially very high financial and reputational rewards, but also can carry great risks. This was dramatically illustrated in the South Korean debacle. Breakthroughs announced in 2004 and 2005 placed South Korea at the cutting edge of this biotechnology. International attention and national celebration was, however, followed by scandal as questions were raised about the ethics and then the scientific validity of some of the work. In this article we focus on how ideas about nation and culture were mobilised in discussion about South Korea. In particular we highlight how the *same* 'cultural explanations' were used to account both for stupendous success and then to explain fraudulent failure. From this perspective discourses about culture are not treated as unproblematic statements of fact but as practices in their own right – which travel across South Korean and international contexts for competing strategic ends. We conclude by discussing how the cultural explanation can obscure as much as it reveals, and also how nationalism might be implicated in discussion of cutting edge scientific enterprise not only in (and about) South Korea, but in (and about) other nation states too. Science and culture are always profoundly intertwined – the South Korean case may be an extreme example of 'scientific nationalism', but it has ramifications for thinking about science and society across the world as a whole.

1. Background

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 in *Science* that they had established 11 stem-cell lines derived from the skin cells of individual patients. However, in November that year allegations came to the fore around unethical research procedure. These were quickly followed by accusations of scientific fraud. In January 2006 both the original papers were retracted from *Science*. At the time of writing Hwang is on trial on three charges: embezzlement, fraud and violating a bioethics law.

This sketchy outline does not do justice to the drama of events which included allegations of bribery and blackmail, and led to death threats, public demonstrations and high-level resignations within South Korea. The scandal also sent shockwaves though the national and international scientific communities raising fundamental questions about the regulation of research, co-authorship, the peer-review process and government involvement in science. This paper focuses on one key aspect of the

story: the constructions of nation and culture which infused the public discourse within, and about, South Korea.

2. Method

The credibility collapse suffered by the Korean stem cell team at the end of 2005 led many commentators to discuss the problem of 'scientific nationalism' in that country– often drawing extensively from the South Korean press or from statements made by key players such as Hwang. Our approach in this paper is rather different. Instead of than treating statements by key players and the media as transparent windows on the 'problem of nationalism' we are interested in how 'cultural explanations' function as a form of discourse. We are, for example, interested in how journalists, scientists and policy makers, used the same 'cultural explanations' to account first for success, and then for fraud, and how these explanations played out both within South Korea and in an international arena. We are also interested in how statements by key players such as Hwang, might be examined not simply as insights into the pressures upon him, but also as forms of strategic talk as he performs national affiliation on a national and international playing field. This article draws on interviews conducted with 9 key players in South Korea: Professor Hwang himself, three journalists working in South Korea and five representatives from Korean religious or civic organisations. We also observed at key events (e.g. Professor Hwang's presentation in Edinburgh in May 2005) and examined mass media and science journal coverage of the case in the UK. In addition we carried out a systematic study of the South Korean press coverage. This last data set is the main focus for this article, and the methodology for this last part of the study is thus outlined in more detail below.

Sample time frame: This paper focuses on the four crucial events in the unfolding story. The first two events are the 'breakthroughs' announced in February 2004 and in May 2005. The second two events are the subsequent scandals: the November 2005 admission that ethical guidelines had been breached and the December 2005 allegations of scientific fraud. We collected one week of South Korean press reporting around each of these crucial time periods for intensive study (i.e. four weeks coverage). This sample comprised a total of exactly 500 articles.

Selection of sample newspapers: Six daily newspapers were selected for detailed study. These represent different characteristics in terms of their ownership and political orientation. Three of the papers are Korean language, and three are produced in English. The Korean language papers included two pro-capital, right-wing papers: the largest and longest established paper, *Chosun Ilbo* (established in 1920) and *JoongAng Ilbo* (established in 1965 and the first to introduce specialist reporters who have doctorates in areas such as medicine). To broaden the range we also included *Hankyoreh,* an independent newspaper established in 1988 by some 200 journalists who had fought for freedom of the press under the military regimes. This is a relatively progressive newspaper amongst Korean mainstream daily papers. The English-language papers we studied were: the *Korea Herald* (established in 1953), *JoongAng Daily* (established in 1997) and the *Korea Times* (established in 1950). All papers were accessed via either KINDS (Korean Integrated News Database System) or individual newspaper's websites.

Content analysis: Each item was systematically indexed (e.g. by date, paper, author) and we examined every example of any critical comment (questioning the context, validity or ethics of the breakthroughs) and recorded who was being quoted (e.g. religious or civil group spokesperson). We coded quotes to indicate whether critical voices were being represented as coming from inside or outside South Korea. We also looked closely at all mentions of Korean culture or references to South Korea as a nation, as well as examining accounts of the national public reaction. This systematic analysis of the main sample was contextualised by skim reading coverage across a broader time frame, right up to June 2006.

A note on working in two languages: In order to address some of the complexities of analysing in two languages 32 Korean language articles were translated by the first author (CC) into English and the choice of specific words and similes were discussed in depth between the two researchers alongside both researchers' reading of the English-language coverage. The coding frame was then developed by both researchers in discussion with one another. Coding of the English-language newspapers was then conducted by the second author (JK); coding of the Korean-language newspapers was conducted by the first author (CC).

The researchers met every day to review what they had done during the period of most intense analysis. We also spent periods sitting together reading through articles to ask questions and discuss any issues as they arose. This approach was necessitated by the fact that CC was a newcomer both to the issue of science reporting and to the methodology of content analysis and the second author was (and remains) a newcomer to South Korean culture, politics and language. However, our approach facilitated a particularly intense form of good practice - encouraging us to reflect on nuances of language and discourse. For example, lengthy discussion explored the way in which different terms might foreground the potential of stem cell research to exploit or commodify (a) women (b) embryos and (c) 'human life'. These can be linked to distinct, although potentially overlapping, conceptual approaches rooted in diverse political perspectives (such as feminism, Catholicism and environmentalism). We also had to pay particular attention to specific cultural implications and how meaning might shift with translation and export. For example, we spent some time discussing a statement that Hwang, who had produced the first cloned dog, was now himself, 'in the dog house'. This form of words was used by the American broadcast CCN in November 2005 and was indignantly repeated by some Korean newspapers. The second author of this paper initially considered the CNN statement to be somewhat jocular, the first author, however, interpreted it as deeply insulting. Sensitivity to such complexities influenced the coding process and discussions between the authors as they conducted the data analysis.

3. Findings

3.1. Celebrating breakthroughs: a source of national pride

Ideas about nation, nationality and cultural identity permeated discussions of the Hwang case within South Korean. From the beginning, the stem cell breakthroughs were celebrated as a national accomplishment - indeed, as a national 'victory'. Professor Hwang's achievements were not only a step forward in conquering disease,

they were a contribution toward South Korea's efforts to establish its status in the world. (1) Hwang in this sense was not just representing himself, or scientific or medical progress, he was representing his country. In 2004 journalists actively promoted this nationalist framing of Hwang's work. The headline of one editorial, for example, simply announced 'A great Korean achievement' and went on to 'congratulate these scientists, who scored a victory amid tough competition among research institutes in advanced nations' (*JoongAng Ilbo* 13 February 2004). Several newspapers advocated more financial investment from the government and called on the public also to 'render its unsparing trust and support' to Hwang's enterprise (*Korea Herald* 16 February 2004). Hwang's team saw themselves as elevating the 'brand value' of South Korea. Hwang himself also promoted his work as a national priority. He said he wanted to stamp the label 'made in Korea' on to stem cell technology and 'fix the national flag of Korea on top of the world' (*Chosom Ilbo* 13 February 2004). (2)

Fig 1. Examples of headlines foregrounding Hwang's breakthrough as a specifically *Korean* achievement

A great Korean achievement (*JoongAng Ilbo* 13 February 2004).

Koreans open the way in organ cloning (*JoongAng Ilbo* 12 February 2004)

Seoul National geneticists lead advance (*JoongAng Daily* 12 February 2004)

In part the competition that South Korea aimed to win was an economic one. Biotechnology was identified as 'the growth-engine to lead the 21st century' and Hwang's work had 'raised Korea to a "powerhouse" of the world of bioengineering' (*JoongAng Ilbo* 16 February 2004). However, the victory achieved by Hwang was also clearly identified as about national reputation and status. The stem cell breakthroughs would put South Korea on the map as a global player – with prestige, that would, of course, in turn be bankable in international collaborations, but which was valued in its own right as a source of honour and pride.

Professor Hwang, who already had important political links before this story emerged, was quickly adopted as a national hero with full government support (Kim, 2006a). National postage stamps were produced to commemorate his work – showing a man leaping from his wheelchair cured by stem cell technology. Hwang was officially granted the title of 'Supreme scientist' and identified as 'The Pride of Korea'. After the publication of his 2005 paper he was given round the clock body guards - a level of protection normally provided only for the South Korean president, his family and a few top government officials. A committee was set up to promote his chances of winning a Nobel prize - not just for his personal glory but in order to bring 'the Nobel Prize *to the nation'* (*Korea Times* 19 May 2004, our emphasis). Hwang's name appeared in school text books and his life story was made the focus of children's books with titles such as 'The Beautiful Life Path of Hwang Woo-suk'. In October 2005 the South Korean government launched the World stem Cell Hub – under Hwang's leadership – to facilitate international networking around stem-cell lines and cloning technology (*JoongAng Daily* 26 May; *Korea Times* 24 May; *Korea Times* 23 May, 2005).

Hwang's breakthrough became not just a scientific or political phenomenon but also a *social* phenomenon. One newspaper, for example, under the headline "Korea falls in love with Hwang, Woo-suk" described how 'Hwang, Woo-suk syndrome' was reverberating across the country (*JoongAng Ilbo* 25 May 2005). Declarations of national pride were expressed in letters to the editors and echoed by journalists who spoke of having tears in their eyes because they were so proud of Korean scientists. Professor Hwang himself promoted his work as a way of restoring Korea's bruised sense of itself as a nation. Speaking to us in May 2005, for example, he commented:

> We were suffering Japanese government for 46 years. So our country, was independent since 1945, we have a very short period to develop our country. If a Korean becomes top of the world in their own field people are very proud. (Interview with JK, May 2005)

Hwang's analysis of the symbolic importance of his work was echoed in press coverage which repeatedly emphasised the impact of his achievements on national morale and underlined the impression Hwang and his team had made on the world stage. The 'World-renowned' cloning scientist Hwang Woo-suk….stormed into the global limelight' (*Korea Times* 23 May 2005), 'making headlines around the world' (*JoongAng Daily* 20 May 2005). 'The world' was said to be showering Hwang with 'unreserved praise' (*JoongAng Ilbo* 20 February 2004). The attention of the international media was particularly welcome. Headlines in South Korean newspapers included: 'World Press Praise 'stem cell cultivation' sky-high day after day' (*JoongAng Ilbo* 16 February 2004) and 'Press from abroad highlight the huge significance of Prof. Hwang, Woo-suk's research results' (*JoongAng Ilbo* 20 May 2005).

Korean journalists also highlighted the number of international scientists now rushing to collaborate with Hwang and his colleagues. Korean stem cell specialists were identified as: 'heroes in their own time'. 'No matter how the stem-cell issue unfolds' wrote one commentator, […] they are on the cutting edge and medical experts from around the world will now be coming to Seoul to sit at [their] feet.' (*Korea Times* 22 May 2005). Quotes from Hwang's U.S. collaborator, Gerald Schatten, were an important mainstay of coverage, and intimate pictures of the two men smiling warmly at each other appeared in many papers. The U.S. scientist delighted Korean journalists with his demonstrations of respect. 'As soon as he met Korean journalists', noted one reporter, 'Professor Gerald Schatten of the University of Pittsburgh […] said "I'm so proud of Korea and Korean people. I'm also so proud of this special scientist Korea has" (*JoongAng Ilbo* 21 May 2005). Several papers also noted, with pleasure, Schatten's statements to the BBC:

> Schatten told the BBC … "the results were more significant than the discovery of vaccines and antibiotics and would rival the Industrial Revolution." (*JoongAng Ilbo* 21 May 2005)

Such acknowledgement made it clear that the enterprising South Koreans had now made their country, as one headline proclaimed, 'The New Land of Opportunity' (*Korea Times* 22 May 2005). Again, the contrast with the U.S.A. (a country which has traditionally revelled in this 'Land of Opportunity' title) was stark. An American-based columnist who contributed regularly to the South Korean press observed:

> The photo on the cover of several vernacular dailies last Saturday tells you almost all you need to know about Asian dynamism and Western lethargy, about why this part of the world is moving forward so fast that the developed world is in danger of being left in the dust. There was Hwang Woo-suk, […] beaming and waving to reporters after his triumphant return home from London. […] The sky blue sign behind him read, in big white letters: Pride of Korea. (*Korea Times* 22 May 2005)

3.2. On chopsticks and other theories: explaining South Korean success

Implicit and sometimes explicit in the discussion of South Korean success are a set of ideas about Korea and Koreans. This is most vividly illustrated by the recurring suggestion (appearing in both Korean and U.K/U.S coverage) that Korean skill with chopsticks contributed to their amazing breakthroughs: enabling them to manipulate slippery human eggs, squeezing out the DNA. Such statements were frequently attributed to Hwang himself (sometimes as a joke). This is a complex and multi-layered account which travels in interesting ways. It could be the subject of an entire article in its own right. Here, however, it suffices to say that in a *Korean* context this could be a semi-teasing remark which also acknowledged Korean manual dexterity and superior skill, particularly with *steel* implements, in contrast to the wooden chopsticks used in other Asian countries (such as its former colonial neighbouring state of Japan). In the U.K/U.S media, however, such accounts could seem simultaneously both self-deprecatory and plausible. The chopstick thesis can be comfortably unthreatening in a western hierarchy in which manual skill is less valued than intellectual prowess. It is also easily 'digested' by non-Korean audiences in the UK or the US for whom chopsticks are iconic symbols of 'Asia'. This international audience is also very familiar with a global division of labour in which delicate tasks such as garment sewing have often been concentrated in 'Asia'.

The chopstick thesis was, however, only one explanation among many for why Korea was so successful in this particular field of bio-technological. Other explanations also had purchase as we demonstrate below. Before examining these explanations, however, it is necessary to reflect on *why* the Korean success had to be 'explained' at all. There are three main reasons for this.

Firstly, explanations were important because the 2004 and 2005 breakthroughs represented an almost 'miraculous' advance; the speed of developments confounded previous predictions. International scientists were 'amazed' and 'astonished' at the apparently 'stunning level of efficiency' (*Telegraph* 20 May 05) and 'remarkable' progress (*Korea Times* 20 May 2005) which had exceeded all expectations. As the science correspondent for Radio 4's 'Today Programme commented (in words that sound different with hindsight): 'It's what people have been looking for and no-one really had the expectation this was going to happen so quickly'. (*Today Programme*, Radio 4, 20 May 05) .The almost 'incredible' breakthroughs had also taken place in a field rife with previously hoaxes and frauds. As Franklin (in press) argues, the cloning process is symbolically linked with the notion of fraud (as in 'cloned' fake Gucci handbags for example) and any claims of cloning (for therapeutic aims) are tainted by association with previous spurious claims of human reproductive cloning (Haran, 2007). Journalists were therefore keen to explain what lay behind Hwang's remarkable achievements and to assert that he was not a 'maverick scientist' (*Korean Herald* 21 February 2004) (3)

Secondly, the *site* of the breakthrough, South Korea itself, made the breakthrough potentially questionable because the UK and the US so often claim a monopoly on reputable science. In international coverage the credentials of the nation were therefore fore grounded and its success accounted for – in a mode which was quite distinctive from the handling of British or US scientific breakthroughs. For example, UK and US media reports reassured readers that the breakthroughs had been achieved by a 'a reputable team in Korea, not a cult, a self-publicist or a maverick scientist' (*Daily Telegraph* February 13, 2004). These were not 'loose-cannon' (*The Times* 23 February 2004), 'rogue' or 'cowboy cloners' (*Sun* 13 February 2004) (Kitzinger, 2007). Perhaps the most significant image of all was evoked by Hwang's U.S.A. collaborator, Gerald Schatten. Explicitly addressing stereotypes about Asia (from the world of cinema) he commented that the Korean team could not be dismissed as 'just karate kids' (Quoted in *Nature*, 11 (5), 2005.)

Thirdly, within South Korea itself the explanations for the breakthroughs were also clearly an assertion of national pride. Newspapers celebrated the 'Korean' nature of the breakthrough and revelled in explaining how national cultural values and practices facilitated the achievement that had attracted such international acclaim. Commentators wrote of the Korean 'hungry spirit' (*JoongAng Ilbo* 16 February 2004) and determination to emerge from the ruins of the Korean War or rise up from a history of colonial oppression or financial crisis (*Chosun Ilbo* 14 February 2004). They noted the popular commitment to technological innovation and praised the notion of 'a national enterprise' which 'is essentially foreign to people in the West where more attention is paid to individual pursuits' (*Korea Times* 22 May 2005).

Over and above such *explicit* assertions, national values were projected though the *implicit* framing of Hwang and his team as an embodiment of the best of Korea. Professor Hwang was hailed as an exemplary citizen: hardworking, economical and modest; who had raised himself up from a poor and humble background. One journalist wrote, for example: 'He lost his father at age 5 and growing up without a father figure was very difficult for him. He knew he had to study to succeed in Korea so he got a job at a farm at a young age to pay for his school expenses' (*Korea Times* 4 June 2004). Far from being a natural high-achiever at school, he had had to pull himself up from near the bottom of the class. As one headline revealed: 'Prof. Hwang, Woo-suk, "400th out of 480 students" in his high school days' (*JoongAng Ilbo* 21 May 2005). Hwang was thus an example of what *any* Korean might achieve through determination and hard work. At the same time, his apparent continued lack of pride or extravagance were noted with approval:

> He rented a small apartment for the last 18 years; he has kept a routine of waking up at 4.30 am, going to the public baths, and then mediating for a hour in Kuksundo [an ancient Korean mind-body healing art] before going to work at 6.30 am – he stays in cheap motels at international conference and also flies economy class […] his philosophy [is] that 'abundance brings laziness'. (*Chosun Ilbo* 20 February 2004)

Hwang's spiritual values were also emphasised in some reports. Thus we learn from Rev. Chonghak that:

> Hwang always comes here early in the morning to participate in the dawn service at 4 a.m. and bows 108 times in front of a statue. In his solemn attitude, I could recognise he is a devout believer. (*Korea Times* 24 May 2005) (4)

Some articles went further and explicitly promoted Hwang as an inspirational leader. The *JoongAng Daily* praised Hwang as one of the 'men of his age'- the type who has 'an eye for seeing change and the future […] [who] have firm faith to put their conviction into practice, and lead the majority' (20 February 2004). Another article, entitled, 'Benchmarking Hwang', called for Hwang to be a role model and 'benchmark' to which Korean politicians should aspire (*Hankyoreh* 25 May 2005). An editorial entitled 'A Quiet Spirit that Offers Hope' similarly identified Hwang as a 'true leader', one of those 'who silently devote themselves to science and to the public'. In praise which now seems rather ironic, he was explicitly contrasted with those 'engaged in deception and cheating with their tongues' (*JoongAng Daily* 15 February 2004).

Hwang himself spoke in similar glowing terms, not of himself, but of his country, his government and his research team. He emphasised, for example, an emotional as well as financial and administrative commitment to supporting his work

> When Ian [Wilmut] visited our laboratory last month he told me 'why your research got so far?'. I said Korea has very positive attitude and positive emotional concept to our research project. Those are the Korean government's feelings about our research, not only financially but also administratively (Profesor Hwang, in Interview with JK May 2005)

He also heaped praise on colleagues, for example, for their patriotism and 'spirit of sacrifice'. He himself, did not wish to stand out ('standing out' is generally considered to be anathema within Korean culture) and he gave full credit to his co-workers. His team, he often said, were like his 'family' – an intimate group dedicated to a common cause, with little regard for individual benefit. Their success was also due to typical Korean dedication and loyalty.

> The people in Korea are very diligent and are truly loyal to their work and company or institutions. There are people here who work on Saturdays, Sundays and even through holidays and they do it on their own without asking for any extra pay. Korean people are very strong and very much dedicated to the country. (Hwang quoted in *Korea Times* 4 June 2004)

Journalists underlined this culture of dedication. Long working hours are actively encouraged in Korean culture – the notion of work-life balance lacking the popularity there that it does in some other countries (Chekar, 2007). Reports thus noted approvingly the hard labour involved in, for example, obtaining animal eggs used to facilitate human stem cell research. The researchers 'needed to go to the slaughterhouse by 5 am everyday […] their monthly salary was less than 500 pounds' (*JoongAng Ilbo* 13 February 2004). The dirty and difficult nature of the work was clearly spelt out. The slaughterhouses were 'full of screams' (*JoongAng Ilbo* 25 February 2004) and 'flooded with blood 'and even young, unmarried, women in the team had to take their turn going to the abattoirs' (*JoongAng Ilbo* 16 February 2004).

In all of this discussion, the idea that the national/cultural context might pose any *problems*, as well as advantages for science in South Korea was notable by its

absence. Indeed, such was the degree of nationalistic investment in the stem cell research enterprise that any critical questioning seemed unpatriotic. This impression was underlined by interviews we conducted in South Korea during the summer of 2005. Representatives from civic groups critical of Hwang's research talked, in interview, about problematic aspects of contemporary South Korean culture. For example, some members of feminist groups expressed concerns that women in South Korea might feel pressurised to donate egg. However, it seemed socially unacceptable to raise such questions about Hwang's work. As one interviewee noted:

> Around the time after the second announcement [May 2005] the social mood was so serious that I felt as if I may be attacked due to my activity, because Professor Hwang had become a hero to Koreans. I mean not just cyber terror or protest by telephone but physical terror like being pelted with stones. (Representative of People's Solidarity for Participatory Democracy interviewed by CC)

The tide began to turn, however, toward the end of 2005. This was when ethical and scientific scandals began to gain public attention. The apparent social consensus began to splinter, and notions of nationhood and culture began to take on very different significance.

3.3. From Pride to Shame – the exposure of ethical problems and fraud.

The major scandals around Hwang came in two phases– the first involved questions about how women's eggs had been obtained, and the second involved allegations of outright fraud. As each exposed a different aspect of discourses around national culture and identity these will be dealt with in turn.

The egg scandal – a dispute over cultural values: The questions of *how* Hwang obtained eggs, from *whom*, and how *many*, first attracted suspicion in May 2004 after an investigation by the journal, *Nature.* However it did not really become a scandal until November 2005 when a South Korean television channel aired the first of a two-part documentary about Hwang. It alleged that Hwang's team had obtained many more eggs than he had admitted, that donors had been paid and not adequately informed of the risks, and, most damning of all, that two of the donors were junior members of Hwang's own team. Just before this programme was aired, Hwang's U.S.A. collaborator (Gerald Schatten) severed associations with him, citing ethical problems. On November 24th Hwang publicly apologized and resigned from all his official positions.

At this point, public reaction within South Korea became divided: revealing a fissure in assumed cultural values and perceived relations between 'West' and 'East'. Some citizens were angry with Hwang for disgracing the nation. Others, however, saw him as misjudged. An internet 'fan club' 'I Love Hwang Woo-suk' passionately defended their hero and hundreds of women signed up to donate eggs for his research. Threats were made against the producers of 'PD Notebook' and advertisers withdrew their advertising from the programme for fear of a product boycott. Other TV channels also took 'PD Notebook' to task for ethical violations in their investigative journalism. The

planned airing of the second 'PD Notebook' documentary about Hwang was suspended.

Clear divisions emerged at this point between the traditionally conservative and progressive press. Headlines such as 'Cultural difference can be no excuse' (*Korea Times* 30 November 2005) vied with the defiant call: 'Need to create Eastern ethics' (*JoongAng Daily* 29 November 2005). Some commentators called for Hwang to abide by 'international' ethical standards, others condemned ethical imperialism. Thus, while a regular columnist for the *Korea Times* declared that Hwang had 'blindly allowed his female assistant to become a human egg farm' (*Korea Times* 30 November 2005), others viewed the problem as a 'cultural clash' and berated Westerners for failing to understand 'our unique family-like lab-culture' (anonymous professor quoted in *Chosun Ilbo* 29 November 2005). For those defending Hwang, it was understandable that women scientists donated eggs, because the whole team was so devoted. For those criticising Hwang this was precisely the problem. As one netizen commented 'the whole team is under hypnosis' (quoted in *Korea Herald* 25 November 2005).

However, even if Hwang was seen as guilty of misconduct, several newspapers took the view that his work should not be disrupted; advances in stem cell technology were too important to the nation as a whole. Under the headline: 'Give Hwang another chance', the *JoongAng Daily* declared*:*

> This stem cell research is the first opportunity for the Korean nation to contribute to mankind since its foundation five thousand years ago. The fruit cannot be taken away by others after we planted the seeds. We should unite our divided national opinion first. Now is the time to encourage Professor Hwang and his research team rather than criticising them on ethical issues (*JoongAng Daily* 25 November 2005).

The fraud exposure – a fall from grace: Although Hwang might have recovered from the egg scandal and found a way of being reinstated, the allegations of fraud which followed were damning. Suspicions about the validity of his research were raised through a combination of young scientists comparing notes on the internet, whistle blowing from within Hwang's own team and tough television investigative journalism. The fatal blows came on 15 December 2005 when Hwang's collaborator, Roh Sung-il, said Hwang had told him there were no individual-specific stem cells as claimed in their 2005 *Science* paper. Roh said that they decided to ask the journal to retract the paper (*Hankyoreh* 16 December 2005). On the same day the second 'PD Notebook' documentary (which had been suspended because of previous public protest) was finally shown. The programme revealed that the DNA of several stem cells received from Hwang's team did not match that of the individual patients from whom they supposedly derived. (5)

An unwashable stain on the nation? Self-reflection and cultural values revisited: Having invested in Hwang as their ambassador – 'The Pride of Korea'– his fall became a source of national humiliation. Headlines read: 'Shocks wave goes through Korea' (*Korea Herald* 17 December 2005) and 'News on fabricated research stuns Nation' (*Korea Times* 15 December 2005). The *Korea Herald* decreed: 'This is a tragic time for Korea' (21 December 2005); the *Korea Times* proclaimed, it a 'trauma the whole nation is suffering' (21 December 2005). 'Hwang-gate' as it became know brought 'national infamy' (*Korea Times* 15 December 2005), and was seen as 'an

'unwashable blemish on […] our country' (President of Seoul National University, quoted in *Korea Herald* 12 January 2006).

Korean biotechnology companies were instantly affected. But this financial blow was not the main story. Instead, the focus was on the impact on Korea's international reputation (See Fig 2).

Fig 2. Examples of headlines foregrounding the Hwang's scandal as a threat to South Korea's reputation.

Burgeoning Stem Cell Dispute: Nation's Global Credibility Severely Eroded (*Korea Times* 16 December 2005)

Hwang Crucial for Korean's Image (*Korea Times* 16 December 2005)

'There are no stem cells'. Nation's global credibility is in danger (*Hankyoreh* 16 December 2005)

While protesting against foreign media's aspersions on the 'Korean character' the Korean media itself did exhibit a degree of hand-wringing about how South Korea had allowed this to happen. The *Korea Times*, for example, under the headline 'Time for Critical Reflection' argued that: 'It is time for the whole nation to undergo some painful soul-searching and then start to pick up the pieces' (19 December 2005). Cultural values and characteristics previously celebrated were now questioned. The 'hungry spirit' previously praised as essential to Korean achievements was now seen as problematic. The 'Number one complex' of the South Koreans was now seen as double-edged (*Korea Times* 23 December 2005). As Hwang himself declared, defending his actions:

> 'The world gaped in awe […] I felt a national pride and tasted the confidence that we Koreans could achieve things too. I was blinded by work and my drive for achievement.' (Hwang quoted in *Observer* 1 January 2006).

Nationalism previously praised, was now problematised. Prof Hwang speaking at a press conference in Seoul declared:

> 'We were crazy for our work. I couldn't see anything else before my eyes; the only thing I could see was the hope that South Korea could stand high at the top of the world. (cited on the *Today Programme*, Radio 4, 12 January 2006)

Long hours in the laboratory, originally reported as a virtue, were now blamed for leading to blinkered obsession. The strong 'family like' lab culture, previously celebrated, was now dissected as potentially contributing to collusion, self-deception and an 'intense pressure to conform and […] groupthink […] of cult-like proportions' (*Korea Times* 19 December 2005).

In the wake of the scandals, South Korean government commitment to promoting biotechnology was identified as creating perverted pressures on scientists. Politicians were accused of appropriating science for political goals (*Hankyoreh* 16 December;

Korea Times 12 December 2005). Media 'fawning', public adulation and 'distorted patriotism' were also all criticised (*Korea Times* 18, 19, 21, 23 December 2005). History, some writers now said, had made South Korea over-invest in the hope offered by Hwang. He was 'South Korea's golden child' in a country 'hungry for a hero who could restore national pride […] Were we not seeking a national cathartic in the nearly unbelievable achievements he claimed?' (*Korea Times* 23 December 2005).

Meanwhile in the international context scientists regrouped. They celebrated the legislation in their own country (in the UK) and called for the pursuit of such research in countries such as the USA. One of the arguments to emerge from the very beginning of the scandal was that if the USA, for example, were concerned about the ethics of stem cell research, this were all the more reason to pursue it, rather than leave it to 'foreigners'.

> A lack of American involvement has meant the first significant breakthroughs have been made elsewhere, in ethically tainted circumstances that have cast a pall over the field. If the medical potential of stem cells and therapeutic cloning is to be realised in a way that is acceptable to Western opinion, it cannot be left to other countries where such considerations have lower priority. It is very hard to influence the direction of work you do not control. The sooner American politicians realise this, the better the prospects for patients of all nationalities will be. (*The Times* November 26 2005)

3.4. Putting South Korea in context – how ideas of nation and culture permeate discussions of science

The above analysis has shown how accounts of the South Korea breakthroughs, and subsequent scandals have been deeply entangled with ideas about nation and culture. Since 'Hwang-gate' broke two key questions which have emerged for the international academic and scientific community are: what were the factors that allowed this to happen in South Korea, and how did patriotism become so entangled with Hwang's scientific achievements? Philosophers, historians, anthropologists and sociologists of science and technology (from within South Korea and elsewhere) have produced fascinating accounts, addressing such questions informed by a detailed knowledge of Korean history and society (e.g. Ahn, S., 2006; Kim, B. and Gottweis, H. 2006; Kim, K., 2006a, 2006b; Kim, S., 2006; Jun, B. and Kim, M., 2006; Jung, K., 2006). This includes crucial research on the status of women within Korea, the history of reproduction and the factors informing the 'egg scandal' (Jeong, 2006; Paik, 2006a, 2006b)

Our focus here, however, has been on another question. We have been concerned with the very construction of a discourse (or set of discourses) which makes nation and nationality their centre - whether that discourse is one produced by scientists or by journalist, whether it is a discourse of pride or shame, and whether the 'cultural character' is used to explain success or failure. This perspective highlights the fact that discourses about nation should not be treated as unproblematic collections of statements of fact and that examining how such discourses play out in an international context can be useful in itself. It highlights how the *same* 'cultural explanations' can be

used first to account for success and then to explain fraudulent failure or how nationalist fervour can be spoken of, at first, as a positive motivating force, and later as a corrupting influence. (See also Zwart, 2006). We would also agree with Paik that is it important to address conflict within 'a culture' and avoid employing the term simply as 'a scaffold to essentialize and naturalize social phenomena' (Paik, 2006a, 9).

A specific attention to historical and cultural contexts is one crucial way of contextualising the Hwang scandal. However, we suggest that it is also important to reflect on 'cultural explanations' because this is only *one* way of explaining a set of circumstances which might be viewed through a different lens. It is important not to 'Orientalise' these issues as if exploitation of women, ethical problems or fraud in technoscience could not happen elsewhere. Focusing on South Korean culture as 'the problem' can seem to imply that hierarchies in laboratory structures or gender relations have no impact in other cultures. It may contribute to assumptions that the abuse of power, ethical violations and fraud are exclusive to the South Korean context. However SST offers many examples of how hierarchies within the laboratory impact on the nature of science (see Satzinger, 2004). Data from both qualitative interviews and anonymous surveys of scientists in other countries also suggests that misconduct is rather more widespread than one might think (Tansey, 2006). For example a recent survey of several thousand scientists in the U.S.A. found that 1.5% admitted to falsification or plagiarism, and about a third confessed to a range of misconduct such as changing results under pressure from funding sources or circumventing minor ethics requirements. (Wadman, 2005)

In thinking about the discourses of nation and culture that played out in, and around, the South Korean debacle it is, at the very least, important to examine how the 'culture of science' and the interlinking of patriotism, national interest and the scientific enterprise operate in other places beyond South Korea. The national press, as Anderson (1991) notes, is often a key vehicle for the construction of 'imagined communities' based on nationality. Banal, everyday nationalism infuses discussion at many levels (Billig, 1995). Many studies have highlighted how ideas about nation, citizenship and culture emerge in media coverage of many different issues: from BSE in the UK (mad cow disease) (Brookes, 1999), to GM crops (Hughes, 2005) to human genetics (Groggin and Newell, 2004). Discourses about nation may be particularly strong where scientific breakthroughs are concerned because international *competition* as well as co-*operation* helps propel science funding priorities in different countries. Governments invest in their scientists both financially and metaphorically. This is displayed in a variety of contexts:

- Science is promoted in many countries around the world as an important economic driving force in the 'knowledge economy'.
- Scientific breakthroughs are regularly spoken about in the language of either war or sport, whereby the 'win' is construed as not just against disease, but also as a victory in international competition.
- Top scientists are often described, *within their own country*, in ways which highlight their national cultural virtues, while 'bad' scientists may be described as distinctly 'alien' in their habits and approach (Haran, 2007).
- Breakthroughs are often presented as being to the credit of the whole nation, not just the individual scientist. A search for the phrase 'British scientists' in UK newspaper headlines, for example, yields plenty of examples foregrounding that it is '*British'* heroic scientific achievers who have discovered cures for

> cancer or Alzheimer's, located the elixir of youth or indeed, made breakthroughs in stem cell research.

Such themes have been clearly evident in discussion of biotechnology in the UK from the very beginning. Ideas about cultural or national characteristics permeated reporting, for example, about the race to map the human genome. The quiet and dedicated *British* scientist, John Sulston, was contrasted with the swashbuckling *American*, Craig Venter, in ways which appealed to certain notions of modest British fair play and scholarly eccentricity versus brash US ruthless new-boy-on-the block capitalism. One journalist, for example presented the struggle as a trans-Atlantic boxing match:

> In the British corner, devoted and earnest, is John Sulston, 57, who drives a second hand car and wears battered leather sandals. Surging out on the U.S. side is Craig Venter, 54, a former 'surf bum' who now has a gold Rolex on his wrist and a £70,000 yacht called Sorcerer as just one of his 'toys'. (*Daily Mail* 27 June 2000)

The subsequent development of stem cell research enterprise has intensified UK competitiveness, with the added advantage that research in the USA is hamstrung by restrictions on federal funding and that the UK has a particular legislative tradition (encapsulated in the HFEA). Stem cell research has been identified as 'a strategically important technology that the UK economy couldn't miss out on; it could be as important to the economy in the twenty-first century as the electronics industry was in the previous century.' *(*Radio 4, *Today Programme*, 2 December 2005).

Not surprisingly, therefore, an element of British nationalism is evident in discussion of both the South Korean stem cell enterprise, and parallel attempts in the UK. Indeed, it was the race between South Korea and the UK that ensured that, on the same day that Hwang announced his 2005 breakthrough, a British team announced theirs (a P.R-inspired piece of timing which enraged one of the co-authors of the U.K paper and was one factor prompting his subsequent resignation) (*Sunday Times* 15 January 2006). Some of the resulting coverage in the UK press on that day focused on British achievements instead of the more advanced development in South Korea. Thus while a South Korean newspaper greeted the news of the day with the jubilant headline: 'South Koreans have done it again' (*JoongAng Ilbo* 21 May 2005), some reports in the UK media highlighted a lesser and more belated achievement by the British: 'Britain clones human embryos' (*Express* 20 May 2005). News reports proclaimed Britain as 'a leader in the search for cures for serious diseases' and announced that 'British scientists' had 'joined an elite club' by cloning human embryos (*BBC News* 19 May 2005). The significance of 'Britishness' was highlighted by a slippery inconsistency in this new report. The UK breakthrough was greeted as having been conducted by a 'team of British scientists in Newcastle' – before introducing the 'Serbian embryologist Miodrag Stojkovic and inviting him to talk about this work. Much was made of the fact that he would not have been allowed to clone human embryos in his native Serbia but had to move to Britain to benefit from the UK's progressive legislation.

In conclusion, this article has examined how discourses of nation and culture infused South Korean discussion of both the breakthroughs, and the subsequent problems, in Hwang's stem cell research. It has highlighted how Hwang's scientific achievements became closely identified with the national interest and cultural values of the country –

to the extent that, within South Korean, criticism came to be seen as almost treasonable. We have also examined how this was translated to constitute a national crisis resulting in South Korean soul-searching in the light of subsequent exposure. We have tried to contextualise our analysis by reflecting on the position of South Korea historically and internationally, but, also by reflecting on the ways discourses operate in other countries such as the UK. The South Korean case might usefully be seen as one of *many* possible case studies and comparative analysis might provide further insights. The sort of cross-cultural comparison carried in Eun-sung Kim's study of bioethical debates in the United State and South Korea is an excellent example of how such work might be pursued. (Kim, E. 2006). Certainly we would suggest that 'Hwang-gate' should not be written off as an 'exotic' aberration, but should offer pause for thought for politicians, scientists, journalists and citizens not just in South Korea, but in other countries as well. Over and above this we would suggest that it is important to consider not just what happened in South Korea, and whether some aspects might be echoed in other countries, but how discourses of 'cultural difference' frame understandings of the problem, and the solution.

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References

Ahn, S. (2006) 'The ironic voices of the public who were silent and mobilized: The public understanding of science as viewed through the "Hwang Scandal" in Korea'. Paper presented at 4S, November 1-5, 2006, Vancouver, Canada.

Anderson, B. (1991) *Imagined Communities*. Verso, London

Billig, M. (1995) *Banal Nationalism*. Sage, London

Brookes, R. (1999) Newspapers and National identity: BSE/CJD crisis and the British Press. *Media, Culture and Society* 21(2), *247-263*

Chekar, C. K. (2007) *Gendering Discourse of Time in South Korean Self-help Literatures*. PhD thesis, Cardiff University

Franklin, S. (in press) *Dolly Mixtures*. Press, London

Goggin, G. and Newell, C. (2004) Uniting the nation? Disability, stem cells, and the Australian media. *Disability and Society* 19(1), 47-60

Haran, J. (2007) Managing the Boundaries Between Maverick Cloners and Mainstream Scientists. *New Genetics and Society*. (in press)

Hughes, E. (2005) The Contaminated Risk of GM Crops: Nationalism and the Genetic Modification Debate. *Journal of Public Affairs*. 5, 251-262.

Jeong, Y. (2006) Representation of Korean Women's Bodies in Biomedical Technologies: From Birth Control to Stem Cell Research. Paper presented at 4S, November 1-5, 2006, Vancouver, Canada

Jung, K. (2006) 'Policy Discourses and Stem Cell Research: Comparing German and Korean Debates'. Paper presented at 4S, November 1-5, 2006, Vancouver, Canada

Jun, B. and Kim, M. (2006) 'The mass mobilization in science: the case of Korean stem cell research scandal'. Paper presented at 4S, November 1-5, 2006, Vancouver, Canada

Kim, B. and Gottweis, H. (2006) 'Explaining Hwang-gate: Biotechnology Governance in South Korea'. Paper presented at 4S, November 1-5, 2006, Vancouver, Canada

Kim, E. (2006) *Impure Bioethics: social and policy studies of bioethics regarding stem cell research in the United State and South Korea*. PhD thesis, Rensselaer Polytechnic Institute, Troy, New York.

Kim, K. (2006a) Overview on the Hwang scandal: the current situation in South Korea. Presented at Wellcome Trust Workshop, *Mechanisms of a global assembly line for scientific facts: the case of embryonic stem cells*. 18 May 2006, Centre for the History of Medicine, London.

Kim, K. (2006b) 'Transformative Scientific Practice in Korea: Slow Virus, Prion, and BSE-resistant Cow'. Paper presented at 4S, November 1-5, 2006, Vancouver, Canada

Kim, S. (2006) 'Biotechnology, Modernization, and Nation-Building in South Korea'. Paper presented at 2006 annual meeting of the Society for Social Studies of Science, November 1-5, 2006, Vancouver, B.C, Canada.

Kitzinger, J. and Williams, C. (2005) Forecasting science futures: legitimising hope and calming fears in the embryo stem cell debate. *Social Science and Medicine 61(3),* 731-740.

Kitzinger, J. (2007) Rescuing Hope: the Hwang stem cell scandal and the reassertion of hopeful horizons. *Science as Culture (submitted for special issue)*

Mandavilli, A. (2005) Profile: Woo-Suk Hwang. *Nature Medicine* May 2005 11(5): 464 [http://www.nature.com/nm/journal/v11/n5/full/nm0505-464.html Accessed 1 July 2006].

Paik, Y. (2006a) *Beyond bioethics: the globalized reality of Ova trafficking and the possibility of feminist intervention*. Presented at the International Forum on the Human Rights of Women and Biotechnology. September 21, 2006, Seoul Women's Plaza, Seoul, Korea.
Paik, Y. (2006b) 'The Traffic in Eggs: Cultural Construction of Ova "Donation" Practice in Korea'. Paper presented at 4S, November 1-5, 2006, Vancouver, Canada
Satzinger, H. (2004) Women's Places in the new Laboratories of Genetic Research in early 20th century: Gender, work, and the dynamics of science. *Studies in the History of Sciences and Humanities*, 13, 265-294.
Tansey, T. (2006) Fraud: problems and perceptions in the UK scientific community. Presented at Wellcome Trust Workshop, *Mechanisms of a global assembly line for scientific facts: the case of embryonic stem cells*. 18 May 2006, Centre for the History of Medicine, London.
Wadman, M. (2005) One in three scientists confess to having sinned. *Nature* 435, 718-719.
Zwart, H. (2006) A Korean tale: epistemology and ethics in the Hwang case. Presented at *Stem Cell Cultures: Exploring the Social and cultural background of European debates*, Nottingham University IGBiS March 11-12, 2006.

Endnotes

(1) The work was seen to provide great hope for the treatment and cure of diseases. Headlines included: "God's hands" Hwang, Woo-suk, might liberate human beings from pains of diseases?' and 'Hwang, Woo-suk, newly writes "a history of conquering diseases" (*Chosun Ilbo* 20 May 2005; 21 May 2005). However, compared to some coverage in other countries, patients themselves had little voice and the National interest had a higher profile than the interest of 'sufferers' (Kitzinger and Williams, 2005).

(2) Hwang seemed to have made slightly different statements in and outside South Korea, or at least in different contexts. To Korean journalists, defending his position, Hwang asserted that stem cell technology 'belongs to Korea', talking to us, as UK academic researchers, however, he emphasised a different element. When asked how it felt to be a national hero, he replied: 'I do not belong only to Korea. I have to do my work for all humankind.' (Interview with JK, May 2005)

(3) This was particularly complicated in the South Korean case by claimed associations with the Realians cult (which developed 'Clonaid' dedicated to reproductive cloning). For example, in 2002 prosecutors in South Korea seized documents from a biotechnology company linked to the controversial sect which claims to have created the world's first cloned baby (*BBC News* 30 December 2002) [http://news.bbc.co.uk/1/hi/health/2614341.stm]. In 2004 Clonaid 'revealed' that they had, indeed, produced their cloned embryo in Korea (*Korea Times* 24 February 2004). In 2006 they publicly offered Hwang a job (*Korea Herald* 17 January 2006).

(4) The issue of spiritual affiliation was something Hwang himself also emphasised in his interview with us: 'I am a Buddhist. […] The base of Buddhism is recycling. Recycling. So although the main concept of Buddhist about life. They think after 49 days after fertilisation they could be considered as human life, so based on the concept of Buddhism this kind of cloning research is a power for mankind. Not harmful it is beneficial /JK: So it's a kind of recycling of life, it's not killing anything. It's re-forming it?/HW: That's why the Koreans, the Buddhists, support my research. They

selected me as one of the great Buddhist Koreans last year'. (Interview with JK, May 2005)

(5) Some people still believe that this was a foreign conspiracy to undermine Korean achievements or that Hwang had been framed (and as we write Hwang is in court arguing that members of his team betrayed him). In February 2006, for example, a Hwang supporter burnt himself to death in protest. His self-immolation was staged in front of the statue of Lee, Soon Shin, the national hero who saved the Chosun Dynasty from Japanese invasion (Kim, E, 2006, 224). In March protestors, carrying placards with statements such as 'Traitor to the Nation' and wearing the national flower of Korea were still picketing or disrupting meetings involving Hwang's critics. (*Korea Times* 13 March 2006).