"Ethics or Economics? Health or Wealth?
Beyond Ova in the Lab"

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presentation at panel session
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and its Feminist Critiques"

at
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in the Age of Biotechnology and Science"

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I would like to thank the organisers, Korean WomenLink, and sponsors for inviting me to this gathering and for all their work in organising it, and to thank the translators for all their long hours. But I would also like to thank all of you for participating in it and for all that you do, in whatever way, to advance women's rights. Although I'm deeply disturbed by what has prompted us to come together – the abuse (or is it just plain *use*?) of women in biotechnology – for me, coming from the United Kingdom, this meeting is especially encouraging, inspiring and strengthening as there is nothing like such organising and mobilising where I come from, at least not from womens' perspectives.

If there is activism in the UK in the context of human biotech research,[1] it serves largely to facilitate it, and I feel that people such as myself have singularly failed to mobilise, channel or build on people's disquiet, unease and concern (which I believe does exist[2]) about the direction of such research and its implications.

Moreover, the framework for discussion and decision-making is invariably pre-set as a dichotomy: you are either *For* cures, progress and women's choice or *Against* them – nothing in between, no ambivalence, and no opportunity to raise other questions or issues, such as how people get sick in the first place, or who looks after them, or what biotech is doing to science, health and society.

I've been thinking about this "failure" since March this year when I saw Dolly the cloned sheep. Dolly died on 14th February 2003 from a progressive lung disease and had arthritis in her hind legs, even though she was only 6 years old, half the average

[1] In the area of agricultural or plant biotechnology, the activism within the UK is much stronger and has inspired many around the world.

[2] *See* Sarah Sexton, "Engineering of consent to human embryo cloning: Why did the British Parliament change the law", presentation at "Diskurs, Macht, Biomedizin" [Discourse, Power, Biomedicine], conference at Institut für Pölitische Wissenschaft, University of Hannover, 9-10 February 2001, http://www.thecornerhouse.org.uk/genetics

lifespan of most sheep (although the sheep from which she was cloned was already 6 years old, so maybe she died "right on time").[3] Her body was not given to medical research, however, but to the National Museums of Scotland because she was created (or invented?) in Scotland.[4] (Confusingly, Scotland is one of the 4 countries that make up the "country" of the United Kingdom, the others being Wales, Northern Ireland and England.)

A now stuffed Dolly stands on her four legs in a glass case – I have to take the museum's word that it *is* Dolly and the scientists' word that she *is* a clone, because she looks just like any other sheep I might see in the fields, and the 6-year old sheep from which she was cloned had been dead for several years before the Dolly experiment began. Dolly's glass case is on a turntable that goes round and round and round and round in circles – much like many of the discussions, questions and activism that cloning in particular and biotech in general has raised. How can we break out of this circle and a pre-set framework?

I will try to do so this afternoon by raising some other issues that I believe are critically related to cloning and biotech research. I hope that looking at this "bigger picture" will help us to identify other allies, movements and campaigns with whom we might join to ensure women's human rights in an age of biotechnology and science.

In addition, I'm concerned that if we overlook essential processes in which biotech research is deeply embedded and intimately connected (besides its rarely acknowledged dependence on women), we might, for instance, draw up excellent guidelines to protect women in cloning research that are adapted and followed the world over – but we might unwittingly strengthen these other processes that work to override women's health and rights. After all, women are in the frontline not only of the reproductive economy, but also of the productive economy and the service economy, including the health and caring economy.

Or, to use a metaphor that I've avoided in recent years but given my country's activities in Iraq is now perhaps more appropriate, we might win the battle but lose the war.

1. Global, Local; International, National

Although the research of Professor Hwang and his colleagues used ova provided by Korean women specifically for the research (much to the envy of researchers around the world), cloning research elsewhere has, until recently, piggy-backed on the IVF industry.[5]

This industry not only operates in many countries worldwide but also advertises itself internationally, thereby attracting women and men who cannot necessarily obtain the

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[3] http://www.sciencemuseum.org.uk/antenna/dolly/index.asp, accessed 14 September 2006.

[4] http://www.nms.ac.uk/connect/me2/me2.htm, accessed 14 September 2006.

[5] For instance, using eggs that did not fertilise in an IVF procedure, or using eggs donated to enable women to become pregnant.

same IVF services in their own country because of practical, legal or financial restrictions – an anonymous donated egg, for instance, or a cheaper service, or some additional related service such as Preimplantation Genetic Diagnosis (PGD) – or simply cannot obtain IVF at all.

Thus women and men (or just their frozen sperm) travel from the UK to Spain, the Greek island of Crete, Romania, the United States and South Africa, while those from Germany go to Poland and other Eastern European countries. The IVF clinics also recruit women living in these receiving destinations to provide their ova, their eggs, often for a price, to these travelling women who want a baby.

The popular or media term to describe this practice is "IVF tourism" or reproductive tourism. British social scientist Naomi Pfeffer points out that this term easily serves to stigmatise infertile women in general, few of whom are privileged tourists. Infertility the world over is first and foremost associated with poverty. The real IVF tourists, Pfeffer points out, are in fact the for-profit clinic owners and biotech companies, which roam the world in search of women to provide ova and embryos.

The US company, GlobalARTusa, for instance, is an egg broker associated with a Romanian IVF clinic. It attributes the success of its egg "donation" programme to "our international source for high quality Oocyte (egg) donations *at exceptional prices*" (emphasis added). It charges would-be mothers $8,000 for the eggs, while paying the Romanian women providing them were paid a maximum of 250 Euros (about $300). "This large price advantage" over the cost of obtaining donor eggs within the US, says GlobalARTusa, is nevertheless compatible with European donors being "remunerated very well by European standards, where the cost of living is lower than that in the United States".[6]

One study of Romanian women selling their ova – and 'selling' rather than 'donating' or 'providing' was the verb they themselves used – mainly for women in Israel and the US to have children via IVF concluded that, in the main, the women knew what they were consenting to, even if they were still worried about their own future fertility, but the need or desire for money drove them on, again on their own admission.[7] In the current low-waged and feminised global economy, selling your eggs is another, perhaps better, "option" for Romanian women than working in the sex industry in Western Europe.[8]

Is the international network of clinics that facilitates the trade in eggs for IVF well placed to expand into a trade in eggs for cloning research?

South Africa, for instance, is already an IVF "tourist" destination, and an organ trade hub as well.

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[6] http://www.globalartusa.com/, accessed 6 September 2005.

[7] Michal Rachel Nahman, *Israeli Extraction: An Ethnographic Study of Egg Donation and National Imaginaries*, unpublished PhD Thesis, Lancaster University, UK.

[8] For more information on trafficking within Europe, *see* the Network for European Women's Rights at the University of Birmingham, UK, which also focuses on reproductive rights: http://www.newr.bham.ac.uk/topics/Trafficking/trafficking_bibliography.htm.

India has a thriving IVF industry, and despite national guidelines to the contrary, "spare" human embryos are already travelling from IVF clinics in India to public and private research laboratories in India and elsewhere. "Emerging anecdotal evidence from India" writes anthropologist Aditya Bharadwaj, "suggests that there is an existing steady supply of human gametes to Western Europe. . . . This commodification and Indianisation of semen, eggs, embryos and stem cells goes much deeper than the media outpourings on the subject." He argues that the production of these relies not only on the state, which champions stem cell research, individuals, the media, scientific research laboratories, but also on public and private investments in biotech production and consumption, and transnational research and trade collaborations."[9] The Indian government's long-term strategy is to encourage research into technologies that other countries find harder to do because their "ethical dilemmas",[10] or 'outsourcing' in today's economic practice.

It would not be hard at all to obtain ova from Indian women for cloning research. Aditya Bharadwaj recalls one woman, who feared being abandoned by her husband and thus reduced to poverty, saying to an IVF doctor, "I will do anything if you can give me a child. I will give you my kidney. Just let me get pregnant".[11]

What do "choice" and "informed consent" mean in these circumstances? US women's rights activist Marlene Gerber Fried points out that "'[C]hoice' appeals to those who have options, but is relatively meaningless to those who do not" and is thus "politically divisive."[12]

Our worries are, I assume, focused on exploitation and commodification: turning processes or entities into discrete, separate things that can be bought and sold or traded. Paying women for their ova implies commodification and exploitation, as does not paying – yet the ovum's very biology is in part resisting becoming a discrete entity separate from its surroundings, because while it can be extracted from women, it doesn't 'live' very long in the petri-dish, nor does it freeze well. Is freezing or cryo-

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[9] Aditya Bharadwaj, "Cultures of Embryonic Stem Cell Research in India" *in* Wolfgang Bender, Christine Hauskeller, Alexandra Manzei (eds.) *Crossing Borders: Cultural, Religious and Political Differences Concerning Stem Cell Research, Agenda* Verlag, Münster, 2005. *See also* Aditya Bharadwaj, "Moral Economy of a Technoscape: The Proliferation of Stem Cell Research in India", monograph, forthcoming.

[10] Ashok B Sharma, "Firms with good track record to get stem cell R&D aid", *Financial Express*, 5 November 2005, http://www.financialexpress.com/fe_full_story.php?content_id=107709.

[11] Comment made by Aditya Bharadwaj at "Vital Politics, Viable Science: The Emerging Bio-commerce of Embryonic Stem Cells in India", 9 September 2006, panel session at Vital Politics II conference, organised by Bios at London School of Economics, 7-9 September 2006.

[12] US women's rights activist Marlene Gerber Fried continues:

> "In a capitalist context, the idea of choice invokes the marketplace – things that are for sale can be chosen. This neo-liberal notion locates rights within an individual and obscures the social context and conditions needed in order for someone to have and exercise rights. The fact that race and class inevitably circumscribe one's choices is ignored."

(Marlene Gerber Fried, "The Politics of Abortion and Reproductive Justice: Strategies for a Stronger Movement", *Different Takes*, No. 38, Hampshire College Population and Development Program, Fall 2005, p.2, http://popdev.hampshire.edu/projects/dt/dt38.php)

preservation rather then money perhaps a key technology to commodifying biotech research?[13]

At present, cloning researchers need “fresh, not frozen eggs”, preferably from young women (not those older women with fertility problems undergoing IVF), and preferably within an hour of being extracted. This means that either the researchers have to go to where the women are (such as India) or women have to be allowed to travel to the researchers (such as women from Eastern Europe travelling to Spain) – or researchers have to persuade women where they are to provide their ova for research (the UK). One British bioethicist has argued that people in Britain have a “moral duty” to participate in scientific research, and contends that compulsion to participate may, in certain circumstances, be justified, although financial incentives are preferable.[14]

How does this international/national, global-local circulation affect what we demand, lobby for and mobilise for in our own countries?

It’s been suggested, for instance, that in the UK, women should *not* try and restrict women providing their ova for research, because to do so will only increase the pressure on women elsewhere[15] – and at least in the UK, we do it properly and

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[13] Many body organs do not freeze well either, though, but there is still a thriving organ and body tissue market.

[14] John Harris, "Scientific research is a moral duty: Biomedical research is so important that there is a positive moral obligation to pursue it and to participate in it", *Journal of Medical Ethics*, Volume 31, 2005, pp.242-248.

[15] Within the UK, women cannot be paid more than £250 for ova donation. The *SEED Report*, published on 7 October 2005, of the Human Fertilisation and Embryology Authority (HFEA) concluded that:

--donors may be reimbursed all demonstrable out-of-pocket expenses incurred within the UK in connection with gamete or embryo donation. (The HFEA set no upper limit to these expenses, but restricted them to those incurred within the UK to prevent men and women coming to the UK on a fully-funded trip so as to donate.)

--donors may be compensated for loss of earnings (but not for other costs or inconveniences) up to a daily maximum commensurate with jury service (£55.19 per day) but with an overall limit of £250 (or the equivalent in local currency) for each ‘course’ of sperm donation or each cycle of egg donation.

--gamete donors may receive benefits in kind in return for supplying gametes for the treatment of others but these benefits should be limited to discounted treatment services.

--procurement of gametes from abroad should fulfil the same quality standards as apply in the UK and the HFEA would expect to authorise imports only where these standards can be met. (http://www.hfea.gov.uk/AboutHFEA/HFEAPolicy/SEEDReview)

But ova donation at present is only allowed for IVF and not for research. In August, the HFEA allowed one of the two teams in the UK carrying out embryo cloning research to ask women undergoing IVF to donate some of their ova to the research in return for discounted IVF treatment.

On 8 September 2006, the HFEA announced a public consultation entitled "Donating eggs for research: Safeguarding donors" on whether women not undergoing IVF should be approached to provide their ova for research. Anyone can send in his or her comments or opinions on this practice, and I would urge you to do so. http://www.hfea.gov.uk/cps/rde/xchg/SID-3F57D79B-0220E4B0/hfea/hs.xsl/380.html#Donating.

regulate.[16] (Although as someone pointed out to me recently, why haven't we been concerned about white women in the US selling their ova to pay for their university education? Is exploitation and protection only something for poor, Third World women?)

Similarly, a new European Union regulation that's just come into force on body tissues and parts outlines excellent standards, but several people are concerned that it will just encourage researchers to take advantage of lower standards in countries outside the EU, such as in Eastern Europe.

"The well-established, highly mobile, somewhat clandestine and transnational nature of both recruitment clinic and vendor populations suggest that attempts to ban oocyte markets will simply push trade underground, into black markets with more likelihood of criminal involvements and further possibilities of harm to the women" points out analyst Catherine Waldby.[17]

So are "harm minimisation" approaches the best approach?

2. Other Tissue Economies

Those concerned about cloning research for whatever reason – we know that most people are *not* really concerned about the impacts on women – often suggest alternative sources for scientific researchers of ova, or of embryonic stem cells, or of

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[16] The UK expressly legalised embryo research (and IVF) in 1990 and established the Human Fertilisation and Embryology Authority (HFEA) in August 1991 to license and monitor all human embryo research being conducted in the UK, the first statutory body of its type in the world. Most embryo research until recently has been connected with reproduction in some form, either to facilitate it or prevent it. In 2001, UK legislation was amended to permit research on embryos for serious diseases. The UK is one of the few countries in the world that allows embryos to be created legally in the laboratory expressly for research, not to result in a baby.(That said, the numbers of embryos created for research are in their hundreds compared with the thousands left over from IVF procedures.) The HFEA also regulates and inspects all UK clinics providing IVF, donor insemination or the storage of eggs, sperm or embryos.

In 2004, the UK government decided to review the 1990 Human Fertilisation and Embryology Act, "given the rise of new technologies, changes in societal attitudes, international developments, and the need to ensure effective regulation." It will replace the HFEA and another government body, the Human Tissue Authority, with a single body, the Regulatory Authority for Tissue and Embryos (RATE), by April 2008, which would have responsibilities across a range of human tissues and cells.

Although the UK is often held up around the world as a model of regulation of these technologies, the emphasis of regulation has been to allow the researchers to do whatever they want to do. The regulation is accordingly changed as the wishes and technological developments themselves change. According to a *Financial Times* journalist, the instincts of the regulatory authority, the Human Fertilisation and Embryology Authority (HFEA) "are clearly to extend the bounds of embryo research and fertility treatment as far as scientific progress and public opinion permit." (Clive Cookson, "Fertility treatment regime 'most liberal in world'", *Financial Times*, 2 June 2006, p.4.) There are intense efforts, however, to win over public opinion. The UK government sponsors public relations courses for stem cell researchers to communicate to the public.

[17] Catherine Waldby, "Oocyte markets: global tissue economies and women's reproductive work in embryonic stem cell research", Working Paper 14, Global Politics Research Group, August 2006. http://www.ioh.uea.ac.uk/biopolitics/networks_publications_working.php

other stem cells, or of other bodily organs, because these sources supposedly don't have the same problems.

For instance, ova from women about to have a hysterectomy, or stem cells from left-over IVF embryos, or umbilical cord blood or aborted fetuses.

I understand the motivation to come up with such alternatives, particularly when any critique is interpreted as being against progress, against scientific research. But I'm more and more convinced that doing so is not really challenging or getting to the root of what is problematic.

Researchers themselves are well aware that they can't get the thousands of young ova they want for their research, even if there weren't any protections in place or even if women were paid. Several of them are adapting their research accordingly and working on their *own* alternatives to produce – or should it be mass produce? – ova and stem cells. For example:

-- taking a slice from an adult woman's ovary and researching how to get the cells to release a mature egg in the laboratory.[18]

-- taking ovaries from female foetuses aborted at a late stage and finding ways to mature their eggs in the laboratory.[19]

-- genetically engineering foetuses so that girls are born with their full 7 million complement of eggs.

-- creating eggs by getting human embryonic stem cells extracted from left over IVF embryos to develop into egg cells, or simply fusing these embryonic stem cells with the cells from the sick adult patient so as to develop suitable transplant cells.

-- or taking just one cell out of an embryo, without destroying it, as in prenatal genetic diagnosis (PGD), and getting it to develop into a stem cell

-- or using the embryos that, after PGD, are found to carry 'the' gene for a particular condition.

> Some scientists have said that these are the most ethical sources of embryos for research because they are not going to be implanted or frozen for a future IVF procedure, but only thrown away and discarded. (Incidentally, it's not just women's language or arguments of choice and rights that have been co-opted in this biotech world. The goals of some environmental movements to tackle the mountains of *waste* produced by the current economy, to emphasise

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[18] One advantage cited for this research is minimising a woman's exposure to the health-threatening drugs used in egg retrieval. The justification is also given that women with cancers whose treatment makes them sterile could still have their own children – and that younger women can pursue their careers and have children later in life, but with their younger, healthier eggs.

[19] Scientists believe that a female foetus has some 7 million eggs in its ovaries; whereas a new-born girl has just 1-2 million; a teenage girl even fewer, and just 400 on average are released in a woman's lifetime.

recycling, to minimise the production of *rubbish*, that we know have been co-opted and subverted by manufacturing industries around the world are now being appropriated by the biotech industry. A green embryo??[20] The appropriation suggests that when we hear using the same language as we might use, we should check whether they actually mean the same thing and, more importantly, are working towards the same goals.)

-- or using the cell biopsied during PGD that carries a particular gene in order to develop a stem cell line with this particular trait so as to study the disease or develop treatments.

PGD is not a common practice during IVF, but there's always room for expansion. The UK recently authorised PGD for 'genes' that indicate a susceptibility (not a certainty) for inherited breast, ovarian and bowel cancer to develop later in life.[21]

-- or obtaining stem cells from fetuses in late-term abortions.

Again, these are invariably labelled as 'waste', facilitating their being put to 'good use' in research. There is in fact a significant international trade in aborted fetuses. And what we call 'adult' stem cells often come, in fact, from fetuses, not people over the age of 18.

(I recently attended a presentation by a leading UK academic stem cell researcher, who is about to start clinical trials in humans of nerve stem cells derived from the brain of aborted fetuses. When asked from the floor where the fetal tissue had come from, he replied, "I'd rather not say, as my commercial sponsors are sensitive about this". But I thought the current international discourse emphasises transparency . . . ?)

-- or from umbilical cord blood.

Again, it's just going to waste. This might seem unproblematic, but one colleague recently pointed out the hazards as following. The blood needs to be captured while it is still flowing, while the mother's body is still pumping the blood down the cord to the baby. It needs to be captured after the baby has been born, but while the cord is still attached to mother and child. This third stage of labour is in fact the most dangerous for women; it's the stage when haemorrhaging and shock is most likely. It could easily be a distraction for attending physicians to be looking for blood rather than looking after the woman.[22]

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[20] For further analysis of "waste in biotechnology, *see* Catherine Waldby and Robert Mitchell, Tissue Economies: Blood, Organs and Cell Lines in Late Capitalism, Duke University Press, Durham, North Carolina, 2006, particularly Part II, "Waste and Tissue Economies",pp.83-130; and Melinda Cooper, "Resuscitations: Stem Cells and the Crisis of Old Age", *Body & So*ciety, Vol. 12 (1), pp.1-23.

[21] http://www.hfea.gov.uk/PressOffice/Archive/1147269507

[22] Point made by Donna Dickenson. In fact, cord blood has been used in blood transfusions for many years. But now the emphasis is on banking or freezing it in case the baby needs it later in life. *See*

Clearly, “a striking feature of contemporary biotechnical innovation is its ever more ingenious use of aspects of female reproductive biology . . . to generate therapeutic tissue.”[23]

These other developments might not involve women's eggs and might not involve embryos, but they still have grave implications for health care, childcare, livelihoods, the public interest, and gender equity and justice – issues that perhaps underlie our unease about egg donation in the first place. Maybe some prior questions need to be asked about *why* such research avenues are really being pursued, and *who* decided to follow and support them.

The suggestions of “alternatives” reminds me of working with women in Thailand, India and elsewhere several years ago in campaigning against the latest contraceptive technology, whether that be Norplant or Depo-provera or the anti-fertility vaccine, because of the negative impacts on women, particularly when introduced as part of a population policy aimed at reducing the numbers of people in a country. As soon as one contraceptive had been blocked, up came another one, which probably didn’t raise the same concerns as the previous one. The researchers had listened to us! But there were invariably problems with the next one, and so the round of campaigning and lobbying began again. What we need, I remember one health activist from India saying, is not necessarily an alternative contraceptive (although we do), but an alternative to the mindset in which these contraceptives are being developed. We need a mindset that aims not at reducing the population but at facilitating women having more determination over their childbearing.

If I find insights from those activists helpful, I wonder whether there are also insights from those who are concerned about another tissue economy, namely the trade in body organs and tissues.

Awareness of “regenerative medicine” and opposition to embryonic stem cell research has renewed calls for more organ donation from already existing people, whether dead or alive. While in the UK, it’s considered very altruistic to carry a kidney donor card, in countries such as South Africa, I gather, it’s the last thing you might do – as you might enter the hospital with a relatively minor ailment, and exit in a box minus your organs. There is a thriving legal, illegal and extra legal market in body parts for which people are killed – for instance, people leaving the countries of Eastern Europe in search of work in Western Europe, or children on the streets of Brazilian cities. As with eggs, it’s continuously emphasised that there’s a shortage of organs.[24]

There are some key differences between organs and ova, though. For instance, in the US, people cannot be paid for providing their organs, but women can for their ova.

Catherine Waldby, “Umbilical Cord Blood: From Social Gift to Venture Capital, *Biosocieties* 1, 2006, pp.55-70

[23] Catherine Waldby, “Oocyte markets: global tissue economies and women’s reproductive work in embryonic stem cell research”, Working Paper 14, Global Politics Research Group, August 2006.

[24] The US group Organs Watch documents allegations of sale and theft of human organs and body parts for transplant surgery. http://sunsite.berkeley.edu/biotech/organswatch/

And because women's eggs need to mature in the ovary itself, women can't simply be killed and cut open.

3. Big Pharma

Despite the stated goals of much embryonic stem cell research being to provide personalised treatments for those suffering from chronic diseases, growing stem cells in the laboratory has proved to be far more problematic than expected.[25] Therapeutic cloning is just not realistic, *they* say.[26] A UK fertility research pioneer, Robert Winston, says with classic British understatement: "We may have oversold this subject a bit too much".[27]

But all is not lost. Now many researchers are pinning their hopes on directing embryonic stem cells to develop into the various different cell types of the body but then using these cell lines to test quickly thousands of chemicals for their effectiveness in treating diseases, circumventing the need for some human and animal clinical trials.

"Nobody's been able to test heart drugs on heart cells [outside the human body] before," said Dr James Thomson, who led the team that first isolated embryonic stem cells in the laboratory in 1998 (and whose US patent on the process is now being applied for in Europe). "That will change medicine a lot quicker than actually transplanting those heart cells." Thomson has predicted that, in the long run, embryonic stem cells will play a more important role in fundamental research than in transplantation therapies.

Sounds good, I thought – until I read some of the insider stories recently published about how Big Pharma, the world's large pharmaceutical companies, operate, particularly in the United States, the world's largest pharmaceutical prescription drug

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[25] For instance, these cells accumulate more and more genetic changes, including mutations linked to cancer. Moreover, most existing human embryonic stem cell lines have been contaminated with animal cells used as a growth medium in the lab dishes; these cells would trigger damaging immune responses if transplanted into a person. Such findings, however, have only added to pressure for new embryonic stem cell lines to be created (Roxanne Khamsi, "Gene defects plague stem-cell lines", *Nature*, UK, 5 September 2005, http://cmbi.bjmu.edu.cn/news/0509/22.htm).

[26] Dr James A. Thomson, who led the team that first isolated embryonic stem cells in the laboratory in 1998, said in June 2005 that he thought current prospects for transplantation cures from stem cell lines are unrealistic, that existing stem-cell lines are not suited to such applications, and that he does not believe there is a need to resort to therapeutic cloning. (Alan Boyle, "Stem cell pioneer does a reality check: James Thomson reflects on science and morality", 25 June 2005, http://www.msnbc.msn.com/id/8303756/. accessed 1 September 2005)

Dr Alan Trounson in Australia, a world expert on embryonic stem cells, was reported in *Nature Medicine* in May 2005 as saying that "the so-called therapeutic cloning to my mind is a non-event". As a way of creating cures, "it's just not realistic". Dr Jose Cibelli of Michigan State University, who has worked with the US cloning company, ACT, said, "I can predict that therapeutic cloning is going to be obsolete" (Michael Cook, "Promises of miracles a false one", *The Australian*, 23 May 2005).

[27] In the UK, fertility research pioneer Robert Winston, who pushed for UK legislation in 2001 to allow embryo research to treat diseases, now warns of a public backlash when it becomes clear that cures are not just around the corner. "We may have oversold this subject a bit too much", he concedes (Tim Radford, "Stem cell hopes distorted by 'arrogance and spin'", *The Guardian*, 5 September 2005).

market. I learnt about the stranglehold they have over the testing and trials of drugs, the regulation of drugs, the prescribing of drugs, the marketing of drugs, the manufacture of drugs, the buying and selling of drugs.

Public funding has been cut back so much that there are few independent, non-industry scientists around who can check the trial data for a drug's safety or effectiveness.

Public funding has also been cut from those who license drugs and who grant patents on drugs. They rely now on the fees that applicants pay for the licences and patents. The result: to survive, these regulatory authorities have to issue as many licences and patents as possible without checking them too thoroughly. In addition, they get bonuses for each licence issued.

Public funding has also been cut from universities. So academics increasingly rely on industry funding for their work in carrying out trials of new drugs. Contract research organisations that carry out clinical trials obviously do as well.[28] In the US, a doctor can earn more money from enrolling a patient on a new drug trial than in looking after that patient.

Because all this is legal and regulated, two of the processes we often call for, it's not called corruption or fraud or conflict of interest.

I mentioned that in the UK, if you raise any concerns about the direction of biotech or scientific research, you're branded as 'anti-technology', which is why many activists are keen to endorse 'alternatives.'

The author of one study of the US pharmaceutical industry, Marcia Agnell, herself a medical doctor and editor-in-chief for 20 years of one of the world's most reputable medical journals, *The New England Journal of Medicine*, that focuses on "research about causes of and treatments for disease,"[29] addresses this point head on. In her book, *The Truth About the Drug Companies: How they deceive us and what to do about it*, she states categorically:

> "I do not want to sound like a nihilist of a Luddite. I know very well that as a result of innovative research and development – in both academia and industry – we have available to us many drugs of immense importance. No one would want to be without, say, insulin for diabetes, antimicrobial agents to fight infections, vaccines to prevent a host of serious diseases, anti-clotting agents to treat heart attacks, chemotherapy for cancer, a panoply of effective painkillers and anesthetics, and many others . . . All of these agents have extended and greatly improved our lives. I would not have spent my professional life at *The New England Journal of Medicine* if I did not deeply

[28] For an excellent analysis of how not just industry funding of research, but the very way in which industry does its research, particularly contracting out clinical trials to dedicated firms, is changing science, see Philip Mirowski and Robert Van Horn, "The Contract Research Organization and the Commercialisation of Scientific Research", *Social Studies of Science*, 35/4, August 2005, pp.503-548.

[29] Marcia Angell, *The Truth About the Drug Companies: How they deceive us and what to do about it*, Random House, 2004, p. xviii.

> believe in the value of medical research and innovative treatments . . . [But] what I do mean to suggest [is that] *too often, all we have is bias and hype*."[30]

In the UK, for several years now, there has been a push to increase the "public understanding of science" and increase "public trust in science" and, I assume, the regulators. A New Zealand colleague recently said to me, in the context of analysing who is doing scientific research and testing drugs, recent safety scandals that some drugs in the US have been involved in – and the lack of any independent scientists to check the work – "why should the public trust science, regulators or drug companies? Maybe they actually understand science just fine -- and quite rightly don't trust it."

4. No Patents on Life! – or just No Patents?

The pharmaceutical industry has long relied on patents on its drugs. As Marcia Angell says

> "The pharmaceutical industry's *lifeblood* [an appropriate word giving what we're discussing] [and indeed that of the biotech industry] is government-conferred monopolies – in the form of patents . . . and exclusive marketing rights."[31]

Despite the current trend for companies to produce drugs that might not be safe or effective, some certainly are. I'm sure you're familiar from AIDS activism about some of the injustices that patents on drugs create – people who need them, whether in North or South, East or West, don't get them . . . and die.[32]

And I'm sure you're familiar with the counter-arguments: that patents are needed to fund research into innovation.

Health activism has demolished these myths by illustrating the industry's "patent games":[33]

- more is spent on marketing than research;

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[30] Marcia Angell, *The Truth About the Drug Companies: How they deceive us and what to do about it*, Random House, 2004, pp.113-114. emphasis added

[31] Marcia Angell, *The Truth About the Drug Companies: How they deceive us and what to do about it*, Random House, 2004, p.173.

[32] In 2003, several top European institutional investors (pension funds and fund managers) wrote to 20 of the world's top pharmaceutical companies saying that the companies needed to reduce the risks to the pharmaceutical industry's reputation from health crises in poor countries, such as AIDS, if their profitability was to be maintained. The main concern of these investors seems not to be for those in poor countries, but that it will become harder for pharmaceutical companies to justify the high prices they charge for their products in richer countries (Geoff Dyer, "Investor warn drugs industry of backlash over health crises", Financial Times, 24 March 2003, p.25; Geoff Dyer, "Investors to increase pressure on drug groups", *FTfm Fund Management*, 24 March 2003, p.1). But as the *Financial Times* points out, "with or without the enforcement of patents, drug companies have no incentive to develop medicine for those who cannot afford to pay."("Drug resistance: The Doha trade negotiations are still far from healthy", editorial, *Financial Times*, 29 August 2003, p.16.)

[33] see Angell, Chapter 10, "Patent Games—Stretching Out Monopolies, pp.173-192.

- much research is funded by the public sector (certainly the case with stem cells);
- pharmaceutical companies get new patents on the same old drug.

Patents have also served to change fundamentally the academic research system within the United States, and increasingly (along with other processes) in the UK.[34] Patents determine what gets researched and what doesn't.

Patents have, in addition, spread the world over by means of the World Trade Organisation's intellectual property agreement, TRIPS, and are now being expanded still further by means of "TRIPS-plus" clauses in bilateral and regional agreements.

A few years ago, I edited a briefing paper looking at how TRIPS – a *protection* mechanism aimed at expanding monopoly rights -- got into the WTO – a *free* trade agreement aimed (in theory) at dismantling trade monopolies. It's a very instructive and illuminating study not so much into patents, but into organising and mobilising and activism – on the part of various industries and governments that is -- given that 20 years ago, almost everyone in the business and trade community thought TRIPS was a bad idea because it was against their interests.

The authors concludes that one reason why they were able to get the most important intellectual property agreement of the 20th century into the WTO was that those "fighting for the preservation of the intellectual commons do so in isolation from each other." [35]

So while I agree for many reasons that patents should not be granted on life – one of the main demands by those concerned about the direction of the biotech industry – the problems are far broader than this, I feel.

[The European Patent Office is at present considering whether to grant a patent on human embryonic stem cells. The Office will receive letters from those with objections. Anyone who wants to know more, please ask me afterwards.)

5. Health Care Services: Affordable? Accessible? What Services?

If we're worried about patents turning living beings into commodities, or about payment to women turning ova into commodities, then there's another commodifying process that we need to be concerned about as well: health care services themselves, both the provision of such services and their funding.

For the past decade or more, the trend the world over has been health care reform – and it hasn't been reform along the Korean lines of trying to get the state or public

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[34] For a summary, *see* Jennifer Washburn, *University, Inc: The Corporate Corruption of American Higher Education*, Basic Books, 2005; Sheldon Krimsky, *Science in the Private Interest: Has the Lure of Profits Corrupted Biomedical Research?* Rowman & Littlefield Publishers, 2003.

[35] Peter Drahos with John Braithwaite, *Who Owns the Knowledge Economy? Political Organising Behind TRIPS*, Corner House Briefing 32, September 2004, http://www.thecornerhouse.org.uk/briefings.

sector to provide more health insurance for more people,[36] so as to "widen the risk pool of health insurance and enhance equity by redistributing financial responsibility",[37] but rather reform in the opposite direction.

Public services may not always be of the best quality or appropriate, even as they aim to treat those who need health care irrespective of their ability to pay. But reforms have not tackled these aspects: instead they have aimed to commercialise, privatise and marketise health care – to turn a health care service into a commodity that can be bought and sold and traded across borders.

I have not found it easy to understand *how* this is done, and each country has its own structure and history of health care provision and financing. But there are two principles underpinning many public health care services (indeed, many health care services): risk pooling and cross-subsidy (I'll explain in a minute). These principles have been the "foundation of effective health policy repeatedly across the world and historically over the last century and more."[38] These principles also serve as constraints on the commodification of health care; unsurprisingly, they are being removed.

Some explanations:
"universal risk pooling" – the different risks of people needing health care services are pooled together across society. Some people are healthy most of the time and need little health care, while others are chronically ill for years on end and need more.

"cross-subsidisation" – services that cost less subsidise services that cost more.

Risk pooling and cross subsidies between rich and poor, healthy and sick ensure that all get tolerably equal access to similar levels of care. Privatised, commercialised and marketised health services do away with both of them, focusing instead on individual payments and individual risks.[39]

Maureen Mackintosh explains further:

> "Inclusive health care systems generally operated on the basis of substantial cross-subsidy within the health care system itself between the better off and the poor and between the health and the sick. Commercialising health care

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[36] Huck-Ju Kwon and Byongho Tchoe, "The Political Economy of Health Insurance in Korea" *in* Maureen Mackintosh and Meri Koivusalo, *Commercialisation of Health Care: Global and Local Dynamics and Policy Responses*, UNRISD/Palgrave Macmillan, Basingstoke, UK, 2005, pp.234-250.

"The delivery of Korean health care was and remains highly commercialized." (p.234)

[37] Huck-Ju Kwon and Byongho Tchoe, "The Political Economy of Health Insurance in Korea" *in* Maureen Mackintosh and Meri Koivusalo, *Commercialisation of Health Care: Global and Local Dynamics and Policy Responses*, UNRISD/Palgrave Macmillan, Basingstoke, UK, 2005, p.242.

[38] [38] Mackintosh, M., "Health Care Commercialisation and the Embedding of Inequality", RUIG/UNRISD, September 2003, p.32.

[39] For more explanations and descriptions, *see* Sarah Sexton, Trading Health Care Away? GATS, Public Services and Privatisation, Corner House Briefing 23, July 2001, http://www.thecornerhouse.org.uk/briefings

> tends to drive out that cross-subsidy, in order to focus provision on profitable transactions. In the extreme, commercial provision can engineer a major shift from serving the poor and ill towards serving the well off and (relatively) healthy. The mechanisms by which this occurs include a decline in risk pooling and rise in risk-rating, if health care insurance systems move towards more private profit seeking and reduced regulation; the exclusion of low income users."[40]

The goal of reform of public health services has been both to reduce public spending on health *and* to redirect public health spending towards the for-profit sector. One result: "commercialisation . . . has generally acted to embed [and reinforce] inequality."[41]

When public services are reduced, or when charges are introduced for them, women tend to be more affected than men are. They use health services more; they work in health services more; they will put their families' needs before their own; the health services they need are no longer provided because there's no money to be made from them.

For other people, health tourism becomes possible. Recent newspaper articles in Britain describe "medical tourists" to India: you can buy a special tour package combining a stay at a medical centre for heart surgery with a sight-seeing trip to the Taj Mahal – I guess there's little wrong with doing that as individuals, but why aren't they being treated at home and how does their treatment affect health care for the majority of people in India itself? India advertises itself as cheaper than Thailand. British newspapers also report about women going to India for sex-selective ultrasound, which is not allowed in the UK, and couples recruiting Indian women as surrogate mothers.

What has this to do with biotechnology? In the context of biotech, critical attention has been paid to the potential impact of the genetic approach on health services, particularly their affordability. Will public health services or insurance schemes, for instance, be willing or able to afford to provide genetic tests and products if they're so expensive because of gene patents? Will extra public resources be provided to health services to provide the non-directive counselling and advice that many of us argue should accompany any provision of genetic tests, whether to women in the context of child-bearing or to adults in general? If so, will these resources of funding, staff and training be additional, or will they simply be diverted from other areas of a health care service?

But those concerned about the consequences of this genetic approach have paid relatively little attention to the growing commercialisation of health services around the world, an ongoing process that is occurring quite independently of the geneticisation of health (or is it?).

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[40] Mackintosh, M., "Health Care Commercialisation and the Embedding of Inequality", RUIG/UNRISD, September 2003, p.33.

[41] Mackintosh, M., "Health Care Commercialisation and the Embedding of Inequality", RUIG/UNRISD, September 2003, p.3.

The genetic approach meshes well with the individualised and privatised approach of health care. A genetic approach puts responsibility and liability for health and sickness squarely onto the individual: "You're sick? you should have got your genes tested and then changed your lifestyle and behaviour. Sorry, your problem".

But if some genetic products will not be offered because they cost too much money, others will be offered, even mandated, because they will save money. Prenatal testing in the UK for Down's Syndrome, for example, now offered to all pregnant women, is explicitly directed at saving the costs of caring for someone with Down's. If an insurance scheme insists on prenatal tests and won't insure someone the resulting "positive" child, what choice does that leave a pregnant woman?

Both genetic and neo-liberal health care models emphasise the individual and downplay the importance of wider society or environment. As Canadian law scholar Roxanne Mykitiuk says: "the new genetics contribute to a re-defined 'neo-liberal' self, which is responsible for the private management of real and potential risks to health." It also is appealing to the neo-liberal state "as a means to develop the industrial potential of the knowledge-based economy, particularly in the health care market."[42]

In many respects, the genetic approach to health, illness and disease mirrors and matches this individual approach to addressing health risks and to financing these risks (individual personal health insurance and pension plans).

6. "In *sickness* and in *health* . . . 'till *death* us do part"

Standard marriage vow in the UK

The ultimate goal of stem cell research, we're often told, is to do something about those chronic diseases for which there are currently no treatments or just ineffective ones, or cures, several of which primarily affect people particularly towards the end of their lives.

The conditions and injuries most commonly mentioned as candidates for stem cell treatment are: spinal cord injuries causing paralysis; insulin-dependent diabetes; Parkinson's disease; Lou Gehrig's disease (amyotrophic lateral sclerosis), also called motor neurone disease; muscular dystrophy; multiple sclerosis; heart failure; kidney failure; blindness; and baldness.

Baldness?? People may not get these treatments, assuming they can be developed, for some of the reasons outlined above, but I begin to wonder if treating sick and old people really is the goal of this research, given the structural or institutional needs or wishes of those who provide treatments: pharmaceutical companies and health care services.

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[42] Roxanne Mykitiuk, "The New Genetics in the Post-Keynesian State", http://www.cwhn.ca/groups/biotech/availdocs/15-mykitiuk.pdf

At present, pharmaceutical companies have the highest sales when people are just ill enough to be repeat buyers of their products, but still well enough to keep their jobs. The best drug is something that alleviates the symptoms, but which you have to keep on taking. After all, sick people either get better and stop buying the product, or they die . . . and stop buying the product.

Thus the best candidates for mass marketing are fairly healthy individuals, not sick ones. Well people who have jobs can afford to pay for medicines; and with biotechnology, they can get even better. The head of pharmaceutical giant AstraZeneca said in July 2001: "I say everyone should die healthy".[43] As the *Financial Times* says: “The commercial promise of prophylactic medicine is compelling. ‘Any drug you take for years and years is likely to be very profitable’.”[44]

The 'worried well' are those who will have gene tests and consume products that they have been persuaded will keep them healthy. The public health concept and language of prevention is yet another that has been appropriated and co-opted. As long-standing genetic activist Ruth Hubbard from the US pointed out over 10 years ago:

> "If an atmosphere can be generated in which none of us feels safe until we have assessed the likelihood that we or our children will develop sundry diseases and disabilities, we will be willing to support this new industry in the style to which it would like to become accustomed."[45]

Thus a trajectory that shows itself repeatedly in the expansion of reproductive, genetic and pharmaceutical technologies is as follows: get regulatory and public approval and acceptance for a drug or treatment for a medical condition, but subsequently promote it for non-medical uses, which many more people could be expected to take up.

The latest, and potentially most lucrative, drugs, for instance, are those developed and approved for sick people but which have a much higher market value if they are consumed by healthy people.

Viagra, for instance, started out as a heart drug, soon became one for sexual dysfunction and is now for everyone.

Human growth hormone, which is derived from genetically engineered bacteria, has been approved for use in the United States for children who have insufficient naturally occurring hormone. An Internet advertisement for this hormone, however, stresses that it is available without a prescription; decreases body fat, wrinkling, cholesterol and insomnia; increases physical strength, muscle mass, energy level, sexual function and mental alertness; stimulates youthful skin and hair appearance;

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[43] ETC Communique, issue 72, *The New Genomics Agenda*, September/ October 2001, p.9.

[44] quote from Jim Hall, analyst at Wood Mackenzie, cited in Victoria Griffith, “Prevention may be the best cure: A trend towards drugs to forestall diseases has some experts worried, but the potential benefits are enormous”, *Financial Times*, 26 September 2003, p.17.

[45] Hubbard, Ruth and Wald, Elijah, Exploding the Gene Myth: How Genetic Information is Produced and Manipulated by Scientists, Physicians, Employers, Insurance Companies, Educators and Law Enforcers, Boston: Beacon Press 1993, p.118.

improves neurological function; and rejuvenates cell and organ tissue. What the advert does not say is that long-term use might elicit diabetes, arthritis, high blood pressure and congestive heart failure.

Other prospective gene-based drugs with large potential markets are those to treat:
- diabetes and obesity being used as diet drugs;
- muscle wasting diseases being used by athletes;
- those to combat memory and brain function loss being used to improve healthy people's memories and intelligence;
- anti-depressant drugs being used to treat shyness; and
- drugs which prevent the skin thinning as it grows old so can be used to treat incontinence being taken to lessen the appearance of ageing. The market for anti-ageing cosmetics is the fastest growing sector of the global cosmetics market.

Stem cells are already following this route. They are being touted for cosmetic and plastic surgery. For instance, stem cells from aborted fetuses are injected into a person's face in clinics in Barbados, Ecuador, Russia and Ukraine so as to get rid of wrinkles. The treatment was initially developed by scientists to treat Parkinson's disease and blood disorders.[46]

Scientists are trying to create breast implants using stem cells taken from a woman's bone marrow. The beneficiaries are described as cancer patients who have had mastectomies, but women who would like breast or lip enlargements would comprise a larger market.[47]

And biotech is not the only technology looking at these markets. One of the first commercial uses of nano-technology is for anti-ageing face creams.[48]

As my colleague Alex Plows at the University of Cardiff in Wales says of such 'enhancements', "These are core examples of why it feels like feminism never even happened."[49]

So just as agricultural biotech needs the hungry, the starving and the malnourished to convince us that genetically modified foods are necessary, even though the main markets are those who have the money to buy these foods and who are already well-fed, so I wonder if human or medical biotech needs sick and old people, but its major market is those who are healthy and young.

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[46] Steve Bloomfield, "Britons fly abroad for stem-cell makeovers", *The Independent*, 16 October 2005, http://news.independent.co.uk/uk/health_medical/article320011.ece

[47] Nic Fleming, "'Master cell' implants to aid plastic surgery", *Daily Telegraph*, 18 February 2005, http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2005/02/18/wcell18.xml&sSheet=/news/2005/02/18/ixworld.html.

[48] Alex Plows, CESAGEN presentation. *See also* ETC Group, *Nanotech Rx: Medical Applications of Nano-scale Technologies: What Impact on Marginalized Communities?*, September 2006, http://www.etcgroup.org. As with egg donation for IVF, however, is it only marginalized communities that we should be concerned about?

[49] Alex Plows, CESAGEN presentation

But I would like to look a little closer at older people, older women, wrinkles and all, to explore how they are being used to justify stem cell research.

The world over, the proportion of older people in various countries is rising, not so much, or not only, because they're living longer – I'm sure you're aware that "Korean female life expectancy tops OECD average"[50] – but also, and more pertinently, because the proportion of younger people is falling . . . because birth rates are falling.

Women, it seems have taken to heart the exhortations that they should have no more than 2.1 children -- and in many countries are having far fewer than this, 1.08 in Korea, the British press report. If we were blamed and targeted for *over*population, now we're being blamed and targeted for *under*population[51] (although only certain women are blamed for this. Poor, black women are still targeted for having too many babies.)

Thus British scientists recently called for IVF to be made freely and publicly available so as to ease the looming pensions crisis.[52] More IVF would lead to more babies who would become workers in the national economy from which pensions could be paid. I'm not sure why he didn't just say go out and get pregnant -- why is IVF needed? -- but more IVF would I suppose yield more ova and embryos for stem cell research for the treatments for older people . . . .

Indeed, much of the focus on ageing in the past decade or so comes, supposedly, from worries about how to pay for the healthcare and pensions of all these future older people, particularly if the state or public sector has to pay.

Advocates of regenerative medicine – encompassing not just stem cells but also growth factors and tissue engineering – have certainly used these arguments to present and justify their solution to the many crises of old age.

Meanwhile, the financial industry has come up with their solution of privatising and individualising pensions. But these have not delivered better pensions or more security in old age – although they have enabled the companies running pensions funds to speculate with millions of dollars on the world's stockmarkets and make profits. The 1997 Asian financial crisis, which affected Korea so much, was in large part triggered by this speculative behaviour.

There are obvious parallels here with stem cell research, perhaps with biotech research more generally. Advocates of the research and of private pensions both speculate on the future, colonise the future, and hold out promises of reward that they don't necessarily deliver on. But maybe that was never the intention to do so? Maybe speculation *was* the goal rather than the means? Maybe expanding the world's stock

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[50] *Korea Times*, 21 December 2005.

[51] Germany now has the lowest birth rate in Europe: 8.5 births for every 1,000 inhabitants. "Baby Shock: We Germans are Dying Out" headlined one newspaper article in March 2006. In response, some politicians have suggested that educated women who do not have children should have their pensions reduced by half.

[52] Ian Sample, "Free IVF for all would ease pensions crisis, say researchers", *The Guardian*, June 20, 2006.

markets was the goal (to facilitate more speculation) rather than providing for security in old age? In the biotech field, UK geographer Kean Birch points out that:

> "the biosciences rely on a future-oriented market that enables the generation of short-term value (ie. in shares or venture capital returns) on the back of expectations that there is then no necessity to fulfil."[53]

I don't want to imply that pensions and healthcare in our older years are not critical issues. They are, and especially so for women:

i) Women live longer than men, so there are more older women – and certainly women are most of what is called the "old, old".
ii) Women are more likely to be poor in their old age, particularly if they've been married, raised children, looked after the sick and tended the elderly themselves.
iii) Women are more likely to be socialised into not being a burden on others. It is with these perspectives in mind that I watch with trepidation the increasing discussions about euthanasia in my country.[54]

Not to end on a gloomy note, however, I remain inspired by the Raging Grannies, who "worldwide rage for peace, social and political justice, and environmental preservation." Their stated purpose "is to create a better world for our children and grandchildren" and they operate "with a sense of outrage, a sense of humor, and a commitment to non-violence" and "can sing, can organize, can mobilize and energize".[55]

7. What Makes You Sick?

But speculation and hype have practical effects. Two writers on "The myth of the biotech revolution" conclude that:

> "Unrealistic expectations are dangerous as they lead to poor investment decisions, misplaced hope, and distorted priorities, *and can distract us from*

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[53] Kean Birch, "The Genetic Ideology Age: The Bioscience Industry as Self-perpetuating Ideology", paper for the 9th Colloquium of the Postgraduate Forum on Genetics and Society, Cardiff University, 31 August-2 September 2005.

For a deeper analysis of this process, *see* Melinda Cooper, "Resuscitations: Stem Cells and the Crisis of Old Age", *Body & So*ciety, Vol. 12 (1), pp.1-23, especially p.8.

For more on "colonising the future", *see* Nicholas Hildyard, "'Scarcity' as Political Strategy Reflections on Three Hanging Children", http://www.thecornerhouse.org.uk/summary.shtml?x=523530

[54] For more information and explanations, *see* Richard Minns with Sarah Sexton, *Too Many Grannies? Private Pensions, Corporate Welfare and Growing Insecurity*, Corner House Briefing 35, May 2006. http://thecornerhouse.org.uk/briefings

[55] quotes from http://www.raginggrannies.com, accessed 14 September 2006.

acting on the knowledge we already have about the prevention of illness and disease".[56]

A genetic approach to health, researched and provided in a market economy as it is, encourages researchers, policymakers and the public to see medicine primarily as a process of "fixing" diseased individuals, and good health as something to be bought and sold in the marketplace by individual consumers rather than as a political goal for society to work toward.

Even if many geneticists now acknowledge that the simple gene-disease causation model is incorrect, and one needs to look at what the gene does, and how it (and presumably the person) interacts with their many environments, the focus is still on the genetic intervention.

Many people with Parkinson's, for instance, one of the targets of stem cell research, have a history of exposure, even low-level exposure, to pesticides, herbicides or industrial solvents. But research, and thus research funds, disregards the large numbers of synthetic pollutants that have permeated food chains, never mind direct exposure.

Some 30,000 chemicals have circulated within Europe over the past 20 years or so, but no one knows what they are or what side-effects they have. The European Union has more or less abandoned its plans to test and register the health and environmental effects of these chemicals because of industrial lobbying – and because other countries objected, arguing that the testing would present an obstacle to international trade in chemicals.

The regulation of products and processes already *known* to have damaging affects on human health or the wider environment, never mind suspected of having, is under threat, or in some cases has been overridden altogether, because such regulation is interpreted under international trade rules as restricting trade.

The aim of the services agreement of the World Trade Organisation, GATS, is to limit state authorities from regulating at all. Its goal is to regulate the regulators.[57]

I'm mindful of this when I and others make calls for research to be regulated. At the moment, the trend is for de-regulation and re-regulation that doesn't impede the profit interest, not regulation in the public interest. At the moment, many stem cell researchers want regulation to prove that they and their work is responsible, to distinguish themselves from irresponsible people in China, for instance.

But I'm waiting for the argument that our good regulation stops us from competing with those who don't have regulation, like India and China.

8. "It's the economy, stupid"[58] – or is it the stupid bioeconomy?

[56] Paul Nightingale and Paul Martin, "The myth of the biotech revolution", *TRENDS in Biotechnology*, Vol. 22, No. 11, November 2004, p.568.

[57] For more information, *see* Sarah Sexton, Trading Health Care Away? GATS, Public Services and Privatisation, Corner House Briefing 23, July 2001, http://www.thecornerhouse.org.uk/briefings

As is probably obvious by now, I don't believe that health, either protecting it or treating it or curing it or enabling it, is really the goal of biotech research (although some people will certainly feel that their health and quality of life is improved by it), because too many structural factors work against this goal, even if many individual researchers are concerned about the sick.

Indeed, countries all over the world seem to be banking on biotech to regenerate their economies – if regenerative biotech medicine can't regenerate older bodies, maybe it can at least do something about California's debts. As two US sociologists have pointed out:

> "The future legitimation for scientific research, which will keep funding at a high level, is that it is increasingly the source of new lines of economic development."[59]

In the UK, in the 10 years since Dolly was cloned, indeed in the 5 years since the UK amended its embryo research and experimentation legislation to allow cloning research, it is now far more acknowledged openly in the UK that the biotech project is an economic venture, not a health one.

The goal of UK publicly funded strategic scientific research over the past ten years has been "to produce a better match" between such research and "the needs of industry". The mandate of the UK government body dispersing biotech funds, the (Biotechnology and Biology Social Research Council (BBSRC) is "to sustain a broad base of interdisciplinary research and training to help industry, commerce and Government create wealth"[60] – the last word does start with a "w", not an "h". Representatives from pharmaceutical, chemical and life science companies are on the boards making the funding allocation decisions.

Similarly, applicants for health research funding from the main government body, the Medical Research Council, have to indicate how their research will help the UK's economy.

For the European Union, its goal in research funding is to make Europe "the most competitive knowledge-based economy in the world"[61] by the year 2010. The European Commission has said that:

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[58] 1992 Bill Clinton US presidential campaign slogan, attributed to political strategist James Carville.

[59] Henry Etzkowitz and Loet Leydesdorff, "The dynamics of innovation: from National Systems and 'Mode 2' to a Triple Helix of university-industry-government relations", *Research Policy*, Vol. 29, 2000, pp.109-123. p.117, quoted in Kean Birch, "The Genetic Ideology Age: The Bioscience Industry as Self-perpetuating Ideology", paper for the 9th Colloquium of the Postgraduate Forum on Genetics and Society, Cardiff University, 31 August-2 September 2005.

[60] ISIS, "Academic-Industrial-Military Complex", November 2002, http://www.i-sis.org.uk/EngineeringLifeAndMind.php

[61] *See* http://ue.eu.int/en/info/eurocouncil/ quoted in Waldemar Kütt, Etienne Magnien and Mark Cantley, "The role of the European Commission in fostering innovation in the life sciences and biotechnology", *Journal of Commercial Biotechnology*, Vol. 10, No. 1, September 2003, pp. 6-14, p. 7.

> "selecting genomics and biotechnology for health as one of the priority themes [for research funding] . . . is in line with a major political and strategic choice the Union made recently in meeting the challenges of the new knowledge-based economy."[62]

But the UK at least seems to have overlooked just what is knowledge, where it comes from and how it's created. I assume that education is an important prerequisite for this – yet the national education system is deteriorating dramatically (cue to bring in the private for-profit sector). There are not enough teachers, particularly in mathematics and sciences. Children are not studying these subjects, and university departments are closing down. Thus, for all its nationalist and anti-immigrant talk and its worries about being outdone in the economic field by Asia, particularly China and India, the UK (and indeed the US) relies on trained scientists from abroad – particularly from countries in Asia!

But for all the hopes and hype about biotech futures, numerous studies, including business ones, repeatedly show that the biotech industry is just not making money. The most recent report, *Beyond Borders*, from consultants Ernst and Young show that the biotech industry is still running at a $4.3 billion loss after 30 years.[63]

So while a lot of knowledge might have been discovered and invented, it has so far been of little commercial value or use, let alone therapeutic. Or as a UK geneticist turned venture capitalist, Sir Christopher Evans, admitted a few years ago, "nothing in biotech has ever come to anything yet".[64]

So if the biotech approach doesn't seem to make much overall sense in health terms, does it make $ense in economic terms? Does it make sense for a country to pin its future hopes on?

The answer is yes *and* no, depending on who you are in the biotech field.

As I suggested earlier, economic gains or profits *can* be made by some groups, companies and countries, even if the research never amounts to any clinical applications, such as new drugs or therapies.

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[62] EUROPEA>European Commission>Research>FP6>Life Sciences, Genomics and Biotechnology for Health, http://europa.eu.int/rapid/pressReleasesAction.do?reference=MEMO/05/121&format=HTML&aged=1&language=EN&guiLanguage=en, accessed 31 August 2005.

As the European Science Social Forum Network (an alliance of civil society organisations) has pointed out, "such an approach supports and judges research and innovation only in its ability to deliver money-making ventures, not whether it can make society a more sustainable and healthy place to live." (European Science Social Forum Network (Civil Society Organizations' Alliance for another European Science Policy) *Framework programme 7: towards a real partnership with society?* http://www.essfnetwork.org.

[63] http://www.sci7.com/cms/60/beyond-borders-ernst-young-2006-biotechnology-report.html. accessed 14 September 2006.

[64] quoted in Marianne Brun-Rovet, " 'Big picture guy' and the biotech drama", *Financial Times*, 5-6 April 2003, p.18.

It can be made, if you're a clever venture capitalist who knows not only when to put money into a firm, but far more importantly, when to get out of it. Or if you're a clever researcher who knows how to get public and private research funding. Or if you're looking at a niche market, such as India doing the research that others have moral qualms about.

It can if you're involved in Information Technology. One sector of the computer industry, for instance, has been thriving in helping the biotech industry to cope with the flood of information that is genes. "Making sense of genetics research requires a massive data processing exercise" says the head of IBM Life Sciences, who categorically states that biotech is "one of the greatest growth opportunities in the whole of IT". Much of the work of the US firm Celera in decoding the – or rather "a" – human genome was "performed by an army of analytical robots and a computer farm that has been called the largest civilian supercomputer in the world".

Nonetheless, I sometimes wonder whether, just as the *belief* in the genetic approach keeps the industry and research going, so too does the belief in the economic approach keep money pouring in – irrespective of what the genetic approach is actually delivering, or not.

Conclusion

In highlighting all these related areas, I'm not suggesting that we take up all these other struggles directly. I know that focus is important. But I do think it's important to be aware of them so as to chose our own strategic interventions carefully, and to widen and build our allies and movements. Because it is in our actions in the present that we build and realise our own alternative visions of the future.

A call for regulation, for instance, has to be located within a wider strategy that keeps an eye on what we are struggling for and not just against. It can definitely be a means of raising awareness, of mobilising, of pointing out what is problematic. And once regulations or standards are in place, they can be a means of holding regulators and researchers to account, as the Korean women's groups are doing by going to court.

But if lobbying for regulation becomes simply a goal in itself, I fear that we may not bring about any structural changes to what's really going on, we may get trapped into narrow arguments about wording -- and we may simply end up doing the industry's and regulator's work for them, unpaid and unacknowledged as usual.

Are we building movements or are building new professionalisms?

I wonder whether, rather than putting the technology at the centre of our critique, is it possible to put women's health and rights at the centre of our vision – and see whether and how any of the biotech project can help in that and under what conditions – and how those conditions can be determined.

I like to quote a New Zealand lawyer, Jane Kelsey, who said in the context of analysing her country's drift to neo-liberalism:

> "Economic fundamentalism pervades everything. There is no boundary

> between economic, indigenous, social, foreign, environmental or other policies. Those who focus on narrow sectoral concerns and ignore the pervasive economic agenda will lose their own battles and weaken the collective ability to resist".[65]

The conclusion of my colleagues and myself in making the case for policy reform in the UK and in Europe in a range of different areas is that the results are limited, no matter how well we argue our case and how well we are received, in the absence of external pressure.

Marcia Angell concludes something similar in her study of the US pharmaceutical industry: "Yes, the pharmaceutical industry has enormous clout, but what finally matters most is concerned public pressure."[66]

Perhaps, like Dolly in her glass case, I have come full circle after all to my starting point: the importance of mobilising and organising.

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[65] Kelsey, Jane., *Economic Fundamentalism*, Pluto Press, London, 1995, p.372.

[66] Marcia Angell, *The Truth About the Drug Companies: How they deceive us and what to do about it*, Random House, 2004, p.259.