This new portrait of Nobelist Martin Evans, who identified embryonic stem cells, has just gone on display at the National Portrait Gallery in London.

STEM CELLS

The clash of hype, hope and stem cells

A revealing book investigates the politicization of regenerative medicine, finds **Gilberto Corbellini**.

Scientists have a fragile power, which is easily weakened when research goals clash with emotive value systems. The controversy over stem-cell research is a good example of this. In *The Stem Cell Hope*, science writer Alice Park investigates the political obstructions that for nearly 15 years have curtailed the public financing of human embryonic stem (ES) cell research in the United States, despite the exciting discoveries that have attached so much promise to the field.

The book begins with the first animal cloning experiments, performed in the late 1950s and early 1960s; Martin Evans' isolation and cultivation of mouse ES cells in 1981; and the birth of Dolly the sheep, the first mammal to be cloned from an adult cell, in 1996. Park discusses the failed attempt of Harold Varmus, then director of the US National

Institutes of Health (NIH), to get public financing for research on human embryos by setting up the 1994 Human Embryo Research

The Stem Cell Hope: How Stem Cell Medicine Can Change Our Lives
ALICE PARK
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Panel. President Bill Clinton rejected the panel's funding recommendation, and in 1996 Congress passed the Dickey-Wicker Amendment to the annual NIH budget bill, ensuring that no federal dollars could be used to support research in which human embryos were created or destroyed. The amendment has been renewed every year since.

Park recounts the obstacles that US researchers have faced to remain internationally competitive in the emerging fields of stem-cell biology and regenerative medicine. She describes how scientists and patients' associations have defended and spread the view that the suffering of living people justifies experimental studies on spare embryos that are left over from infertility treatments and will never be implanted, and so will never become human beings. We meet James Thomson, who in 1998, while working at the University of Wisconsin-Madison, became the first scientist to cultivate human ES cells, thanks to the financial support of the biotechnology company Geron. We also listen to the justifications of the president of the Wisconsin Alumni Research Foundation, which took aggressive control over the patents to Thomson's cells, issuing licences with one-sided terms that irked some scientists.

The author interviews Jay Lefkowitz, the policy adviser who prepared President George W. Bush's televised prime-time address of 9 August 2001, in which the president authorized the use of "more than 60" existing lines of embryonic cells. Lefkowitz reveals how a division inside the White House cabinet pushed stem-cell research to the top of Bush's agenda, prompting the president to change tack after having promised during the 2000 presidential election to prohibit research using human embryos. Park does not comment on whether polls published in the weeks before the address, showing that the majority of US citizens favoured research on spare embryos, might have influenced Bush's decision.

The success of California's Proposition 71 referendum in 2004, which enacted a law supporting stem-cell research in the state, shows that organized and well-financed actions of civil commitment are possible in the United States, despite being almost unknown in the rest of the world. The proposition resulted in the creation of the California Institute for Regenerative Medicine in San Francisco — a pivotal moment in the process by which private foundations and patients' associations helped US scientists to continue their research on human ES cells and explain the field's therapeutic value to the public.

With the sad story of the downfall of Korean cloning scientist Woo Suk Hwang, who in 2009 was convicted for gross ethical violations, Park portrays well the hellish vortex that can engulf the scientist who

"Private foundations and patients' associations helped US scientists to continue research on human ES cells."

► allows himself to be manipulated by media and political pressures into touting spectacular results. The Hwang case could have been devastating for the field. Luckily, a new protagonist emerged, with results that were promising and reproducible. Japanese scientist Shinya Yamanaka restored the field's credibility with his careful work on induced pluripotent stem (iPS) cells — adult cells genetically reprogrammed to mimic natural stem cells capable of developing into any other type of cell, and which could potentially be used instead of human embryos. But because iPS cells emerged from work on human ES cells, the latter remain essential to understanding the biology of human tissue formation.

Park does not discuss how the politicization of regenerative medicine contributed to the popularity of stem-cell tourism and treatments of doubtful effectiveness. In this regard, oversight by the International Society for Stem Cell Research (www.isscr.org) in Deerfield, Illinois, is valuable. Bypassing sluggish governments, the society provides guidelines for how to design translational studies and informative tools to protect

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patients against deceptive advertisements of stem-cell therapies.

The book ends with the White House ceremony on 9 March 2009 at which President Barack Obama signed the executive order “Removing barriers to responsible scientific research involving human stem cells”. Surprisingly, Park does not mention the still-unresolved *Sherley v. Sebelius* litigation, which, in August 2010, resulted in the US District Court for the District of Columbia passing an injunction to block the effect of Obama's decision on the basis that it violated the Dickey–Wicker Amendment. This April, the US Court of Appeals for the District of Columbia Circuit overturned that preliminary injunction, but the case is still open to further court decisions, arousing concerns among scientists and patients.

Nevertheless, *The Stem Cell Hope* is an instructive report about the negative effects of politics on regenerative medicine in the United States. ■

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Many argue that the United Nations is ill-suited to controlling carbon emissions.

CLIMATE CHANGE

Beyond Kyoto

Gwyn Prins commends the latest tome to advocate better ways to accelerate decarbonization.

There are omens and portents abroad. Not owls in the forum at midday, but spontaneous convergences of scholars of the history of human endeavours to reduce global warming. Among these, David Victor is an established expert. *Global Warming Gridlock* is a welcome addition to a rapidly growing set of perspectives on climate issues: on the causes of the crash of the 20-year Kyoto Protocol approach for tackling anthropogenic carbon emissions; and on possible and better alternatives. Together, these scholars are setting the stage for the next phase of global climate policies.

The change in the weather has been astonishing. When Steve Rayner and I suggested in *Nature* in October 2007 that the Kyoto Protocol should be ditched (*Nature* 449, 973–975; 2007) because it was doomed never to work and, furthermore, was licensed economic ‘rent-seeking’ — making money from taxpayers by promoting regulations but returning no value — the response was shock and much media attention. Nor were we alone; Victor's excellent earlier book, *The Collapse of the Kyoto Protocol* (Princeton University Press, 2001) was one trailblazer.

In *Global Warming Gridlock*, Victor rehearses why the

United Nations is “ill-suited to take the starring role” because the actions of only a handful of countries really matter. He explains why a quest for legally binding agreements is futile, because it is guided by “lessons drawn from the wrong histories”: from plausible but inappropriate analogies to treaties for well-defined (‘tame’) problems, whereas climate is a complex (‘wicked’) one. As Rayner and I explained in 2007, Kyoto is basically a modified nuclear arms-control treaty. Victor agrees and adds new insights, such as the role of the 1970s quest for supersonic passenger flight, which gave rise to the Climate Impact Assessment methodologies so central to the Kyoto regime.

Today, such an analysis is no longer controversial. Even Yvo de Boer, former chairman of the UN Framework Convention on Climate Change, was making the case for Nationally Appropriate Mitigation Actions (NAMA) — or ‘carbon clubs’ as Victor calls them — at the COP16 meeting last December in Cancún, Mexico.

Victor's book went to press just before the Cancún meeting, and predicted more of very little progress. Yet Japan gave a historic lead by declaring that it would never subscribe to a second Kyoto commitment period, thus disproving one of Victor's suppositions that Japan would never have the guts to do this. And Russia and Canada joined Japan at the G8 Summit in Deauville, France, on 29 May 2011. Meanwhile, the United States confirmed that it would remain outside the treaty.

But at Cancún, a conjurer's trick was performed. Kyoto was dead on arrival, yet some groups — led by the European Union with the United Kingdom as cheerleader, and most of the developing world — argued

Global Warming Gridlock: Creating More Effective Strategies for Protecting the Planet

DAVID G. VICTOR
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