

CLIMATE CHANGE—2057

Writing in 2057, the *BMJ*'s Africa correspondent, **Robin Stott**, looks back at the development of the greatest medical advance of the first half of this century

Over 50 years ago, the *BMJ* asked readers to identify the key advances that had improved health since the first edition was produced in 1840. From a shortlist of 15, introduction of sanitation was voted the most important.¹ Today we publish the result of a comparable survey covering the past 50 years. From the 15 shortlisted advances (see box) readers once again put a public health initiative in first place: the role that health professionals played in the campaign to mitigate the ravages of climate change. The *BMJ* was in the forefront of this campaign, described below.

Information and affirmation

In 2006, there was growing concern from many experts about the problems that global warming posed for health. Recognising the urgency of the situation, health professionals acted decisively, including forming the influential climate and health council.²

First we informed. Health professionals articulated the gravity and extent of the problem and emphasised that all consequences would be much worse for the two billion globally disadvantaged people, most of whom lived in the non-industrialised countries. We also offered hope, pointing out what is now clear—that moving to low carbon societies would be health improving for all.

Second we affirmed. As health professionals we were among the first to reduce our

THE 15 SHORTLISTED ADVANCES

- Action against climate change
- Use of dark energy to correct chromosomal abnormalities
- Thumbnail sized patient record carried in a subcutaneous pocket of the individuals' choosing
- Manipulation of telomeres to ensure healthy old age
- Legislation for end of life decisions
- AIDS vaccine
- In vitro growth of new organs
- Functional MRI enhancement of counselling for depression
- Male contraceptive pill
- Mosquito sterilisation
- Phagocytic stimulation as a substitute for antibiotics
- Walk in diagnostic box giving instantaneous biochemical, haematological, and imaging information
- Apparatus for measuring persistent organic pollutant levels in any material
- Regulan tablets for regulating the amount of energy burned in metabolism
- Remote surgery

individual carbon footprints and to persuade the institutions we worked in to do likewise.

Through this leadership role of information and affirmation, we brought together major health professional institutions, inspired academics, ambassadors, architects, engineers,

lawyers, and teachers to join us, and used our collective advocacy skills to achieve the crucial breakthrough. The adoption of contraction and convergence³ at the 2009 UNFCCC (United Nation Framework Convention on Climate Change) meeting in Copenhagen, and for which Aubrey Meyer, its author, received the Nobel peace prize in 2013, marked the turning point in the campaign.

A global framework

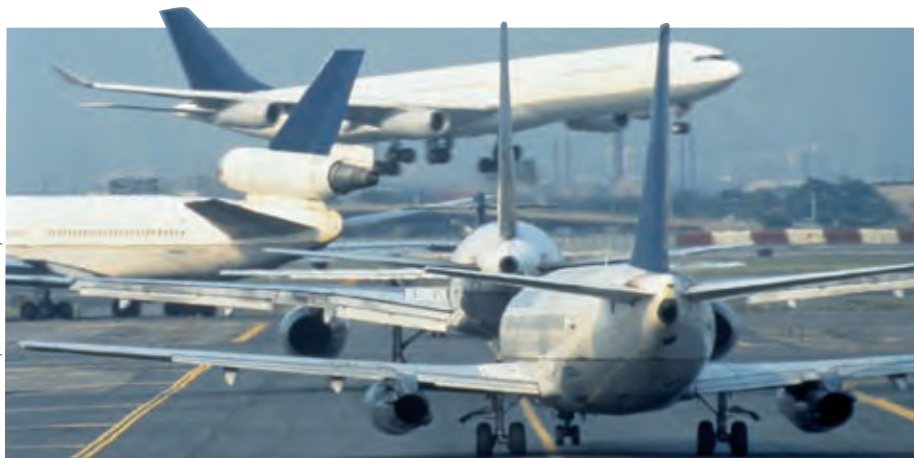
By 2006, it was clear to all that resolving the problem of global warming needed a global framework and this required the active participation of all people. Those populations in the disadvantaged world, who had little responsibility for global warming, pointed out that any framework would have to deliver them sufficient resources to get similar development benefits to those that the advantaged world had secured through the burning of fossil fuel. Any viable framework had therefore to cap and reduce global carbon emissions while at the same time ensuring that the most disadvantaged people received resources that would enable their development. Of the various contenders, by far the most feasible framework was contraction and convergence.

Alarmed by the increasing frequency and escalating costs of serious climate related events, and alarm accentuated by the demand for oil outstripping the supply,⁴ the contraction component was readily agreed by the communities of the rich world. Contraction entailed setting a global carbon budget and reducing this annually so that atmospheric levels of carbon dioxide didn't exceed 450 ppm, giving us a 50:50 chance of avoiding dangerous climate change. The turbulent political times of the early part of this century, however, meant that getting agreement to convergence was more difficult. Persistent pressure from health professionals on all UN bodies, amplified by the outstanding statesmanship from senior leaders of the Mandela mould, was needed to persuade the global decision makers of the efficacy of convergence.

Convergence entailed giving an equal entitlement of carbon to each of the then four billion adult inhabitants of the world. Disad-



By 2007, doctors realised they had to put their own house in order . . .



... and think hard before attending another international meeting

vantaged people, who were almost all low carbon emitters, would have entitlements to sell to the high carbon emitters of the rich north. The market in carbon entitlements would be constrained by the reducing global carbon cap, but within these constraints the disadvantaged, by redeeming their entitlements, would get substantial flows of money. Furthermore, the market signals for all concerned would be toward low carbon investment. There were both philosophical and practical objections raised to this simple and elegant solution. Some pointed to the fact that the entitlement didn't take into account the amount of fossil fuel burned by the rich nations over the preceding two centuries, though they failed to offer a viable framework that did. Others worried about the practicalities of implementation. Advocates of contraction and convergence responded that any global framework would be difficult to implement. Once the principle was accepted, the numerous agencies with experience of working across the globe would find a way, and so it was. Others objected that the level of corruption in disadvantaged countries meant that no market

mechanism could work to the advantage of the poor. Pilot studies in Mozambique, the state of Bihar in India, and Nicaragua refuted this pessimistic view. The unwavering commitment of the professional bodies countered the opposition and, by pointing out the enormous public health benefits of moving toward a more equal low carbon world, won the argument for the convergence component of contraction and convergence.

Cycle of virtue

Contraction and convergence created a global virtuous cycle of activity giving environmental, economic, and social benefit, particularly to the poor. This global virtuous cycle unleashed numerous similar cycles at all levels of society, of which the local cooperative production of renewable energy is perhaps the best known. With a reliable energy supply, people became self sufficient in food, creating a secure local economic base. Female literacy reached 95%, family planning became affordable to all who wanted it, and the money flow enabled the realisation of the millennium goals.⁵ A proliferation of carbon capture technologies blos-

somed in the north, creating meaningful work and the psychological boost of realising that each locality could be part of the solution. Cuba, which underwent an enforced decarbonisation of its economy in the early 1990s, by 2006 was the only country in the world that had achieved its UN development targets without exceeding its footprint and gave reassuring testimony of the benefits of moving to a fair shares, low carbon society.⁶ Thus was set in place the global transformation that we have been privileged to be part of.

As the Africa correspondent of the *BMJ*, I am writing this article today in a Dar es Salaam where local production and consumption cycles contribute to a vibrant social and economic society that flourishes within environmental limits. The infant mortality is 20/1000, fertility rate 2.1, life expectancy 75, there is universal culturally appropriate education, and a female president oversees a parliament with 50% of women members. The major turbulence of the past four decades is behind us. By the foresight and actions of those pioneers 50 years ago what could have been a global health catastrophe has been averted. It is not surprising that our readers have identified the actions to mitigate climate change as the most important medical advance of the past 50 years.

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- 1 Ferriman A. Readers choose the "sanitary revolution" as greatest medical advance since 1840. *BMJ* 2007;334:111.
- 2 Climate and Health Council. www.climateandhealth.org.
- 3 Global Commons Institute. Contraction and convergence. www.gci.org.uk.
- 4 Simmons M. *Twilight in the desert*. Chichester: John Wiley, 2005.
- 5 Sachs JD. Can extreme poverty be eliminated? *Sci Am* 2005;293:56-65.
- 6 World Wildlife Fund. *Living planet report 2006*. London: WWF, ZSL, GRN, 2006. www.wwf.org.uk.

Horrible phenomena! Galvanism

On the 4th Nov. last, various galvanic experiments were made on the body of the murderer Clydsdale by Dr. Ure, with a voltaic battery of 270 pairs of 4 inch plates. The results were truly appalling. On moving the rod from the hip to the heel, the knee being previously bent, the leg was thrown out with such violence as nearly to overturn one of the assistants, who in vain attempted to prevent its extension!

In the 2d experiment, the rod was applied to the phrenic nerve in the neck, when laborious breathing instantly commenced: the chest heaved and fell; the belly was protruded and collapsed, with the relaxing and retiring diaphragm; and it is thought, that but for the complete evacuation of the blood, pulsation might have occurred!!

In the 3d experiment, the supra-orbital nerve was touched, when

every muscle in the murderer's face 'was thrown into fearful action'. The scene was hideous - several of the spectators left the room, and one gentleman actually fainted, from terror or sickness!!

In the 4th experiment, the transmitting of the electrical power from the spinal marrow to the ulnar nerve, at the elbow, the fingers were instantly put in motion, and the agitation of the arm was so great, that the corpse seemed to point to the different spectators, some of whom thought it had come to life! Dr. Ure appears to be of opinion, that had not incisions been made in the blood vessels of the neck, and the spinal marrow been lacerated, the Criminal might have been restored to life!!!

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Submitted by John Johnson, Bamburgh