from the World Slasher Cup in Manila. He shows cockfighting as the brutal pastime it is, while recognizing it as an important chapter in human–chicken relations.

Chicken's mealtime ubiquity dates from the twentieth century. African Americans and Jewish immigrants brought the bird into US cities, and farmers who had once viewed chicken-keeping as women's work survived the Great Depression thanks to income from the birds. But wartime rationing of other meat put chicken on every plate. First held in 1948, the US Chicken of Tomorrow contest was conceived by supermarket chain A&P (and later sponsored by the US Department of Agriculture) to improve the efficiency of poultry production and expand the fledgling market. Before the contest, chickens bred for meat took 70 days to reach an average of 1.4 kilograms. Modern birds take 47 days to reach 2.6 kilograms, and they convert feed to meat 50% more efficiently (although many spend their lives in chronic pain because of the extra body mass). US chicken consumption is now four times what it was before the contest.

Readers of Michael Pollan's *The Omnivore's Dilemma* (Penguin, 2006) or Christopher Leonard's *The Meat Racket* (Simon & Schuster, 2014) will know the rest of the story. Leonard used the term "chickenization" to describe the 'vertical integration' of meat production developed and perfected by conglomerates such as Tyson Foods, whereby farmers have no ownership or control over the flocks they breed, which often number tens of thousands of birds. Americans eat more chicken meat per capita than any other nation, but the rest of the world is catching up. China surpassed the United States in overall chicken consumption in 2012. Meanwhile, the mass culling of chickens across Asia to stop an avian-influenza pandemic shows that chicken health is a global concern.

Lawler is not the first to denounce the inhumane treatment of the animals or to raise the red flag about bird flu. But his perspective as a science reporter gives fresh insight into the problems created by the ubiquity of chickens — as well as possible solutions. Especially compelling is the profile of Janice Siegford at Michigan State University in East Lansing, who is studying how to improve the welfare of chickens bred for food ('cage free' labelling is no guarantee that a chicken does not suffer throughout its life). Lawler recognizes that modern chickens — perhaps unlike genuine red jungle fowl — are here to stay. Who knows, maybe they will one day make it to Mars. ■

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STEPHEN CUMMISKEY



# A climate trance

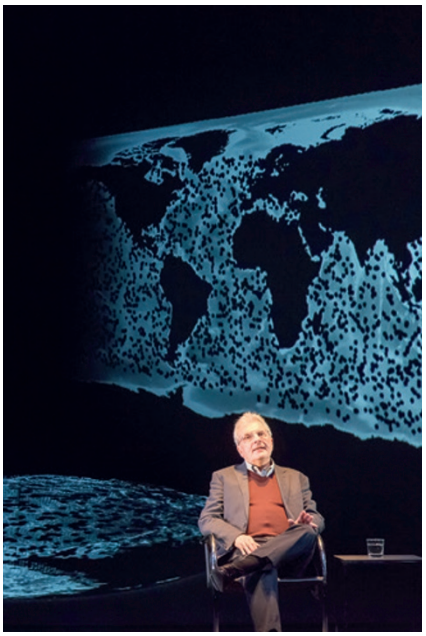
**Richard Van Noorden** considers a technical lecture that ultimately fails as theatre.

House lights down. A spotlight picks out a man, seated: climate scientist Chris Rapley. "I'm here to talk about the future," he says. Behind him on three giant video walls swirl greyscale images of tides and seas, and satellite views of Earth. So begins *2071*, a piece about climate change at London's Royal Court Theatre.

Rapley calmly lays out his credentials. Professor of climate science at University College London; former director of the British Antarctic Survey; former director of London's Science Museum. At a measured pace, he unfolds what he has seen and what scientists have learned, through means such as satellites, ocean buoys and ice cores, about the crumbling West Antarctic Ice Sheet, sea-level rise, the Holocene and Anthropocene epochs, and the interactions between lithosphere, biosphere, hydrosphere, cryosphere and atmosphere. The grey backing visuals break into big, moving white-on-black bar charts.

After 15 minutes, the audience realizes that there will be no let-up: *2071* is not a play, but an address just over an hour long. Rapley is the sole performer. This is a scientific lecture.

Global sea-levels are rising by 3.3 millimetres a year, Rapley says. The ocean is acidifying. Changes in solar radiation are not responsible for the observed temperature rise, because we see that the upper atmosphere is not warming, but cooling. The multisyllabic drone goes on, a flow of data lent emotional resonance only by a tense, unsettling soundtrack.



**Climate scientist Chris Rapley in *2071*.**

**2071**
WRITTEN BY DUNCAN MACMILLAN AND CHRIS RAPLEY; DIRECTED BY KATIE MITCHELL
*Royal Court Theatre, London. 5–15 November 2014. The Deutsches Schauspielhaus, Hamburg, Germany. 17–18 December 2014.*

Rapley and director Katie Mitchell are trying, perhaps in response to the histrionic climate politics of recent years, to establish a quiet, concentrated atmosphere in which to lay out the facts. But Rapley's monochrome recital risks sending his viewers into a climate trance, eyes glazed over by science. At one point, he starts quoting verbatim from the latest report of the Intergovernmental Panel on Climate Change; his delivery hardly changes in tone. The script's worst sin is that it fails even on its own terms. Although he sets himself up as bringing home scientific truths, Rapley in fact makes no effort to convey the human realities of acidifying oceans, rising sea levels, or two- or four-degree rises in global temperature. (The play's title makes a stab at humanizing the proceedings — *2071* is the year when Rapley's eldest grandchild will be the age he is now. But it's an awkward attempt.)

Mitchell's critically acclaimed 2012 play on population, *Ten Billion*, featured another professor, computational scientist Stephen Emmott, delivering another talk, in a stage recreation of his office. But where that was an entertaining polemic ("I think we're fucked," Emmott concluded), *2071* is sober and technical. Despite the scientific consensus behind Rapley's words, it is difficult to imagine that it will engage even a willing audience. Aiming for authenticity, Mitchell and Rapley have missed a chance to create a piece of drama that really gets under the skin of the issue; one that might seamlessly blend instruction and inspiration. But for those with an appetite for the stark facts on climate change, *2071* is just the ticket. ■

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