

BOOKS & ARTS

Dark days at the White House

Has the George W. Bush administration manipulated science for political ends?

Undermining Science: Suppression and Distortion in the Bush Administration

by Seth Shulman

University of California Press: 2007.

202 pp. \$24.95, £15.95

John Horgan

Two years ago the journalist Ron Suskind offered a disturbing insight into the presidency of George W. Bush. In an article in *The New York Times Magazine* on 17 October 2004, Suskind quoted a senior White House adviser mocking journalists and others in the “reality-based community” who believe that “solutions emerge from your judicious study of discernible reality”. The adviser added: “That’s not the way the world really works anymore. We’re an empire now, and when we act, we create our own reality.”

I kept thinking of this statement as I read *Undermining Science*, in which journalist Seth Shulman exposes the Bush administration’s attitude towards the “reality-based community” of scientists. Shulman’s book expands on a report he compiled for the Union of Concerned Scientists (UCS), a non-profit US watchdog group. Issued in February 2004 during Bush’s re-election campaign, the UCS report, entitled ‘Scientific Integrity in Policymaking’, charged that the Bush administration “is, to an unprecedented degree, distorting and manipulating the science meant to assist the formation and implementation of policy” on a wide range of issues, including climate change, air and water pollution, wildlife protection, sex education, reproductive health, drug abuse, AIDS, workplace safety and missile defence.

The UCS also released a statement in which 62 prominent scientists accused the Bush administration of bending scientific facts to fit its political agenda. Some of the signatories, such as the physicist Richard Garwin, a designer of the hydrogen bomb, had advised Republican as well as Democratic administrations. The report and statement — now signed by more than 10,000 scientists — triggered widespread commentary. In an editorial on 26 April 2004 entitled ‘Bush-league Lysenkoism’, the normally staid *Scientific American* declared: “It is increasingly impossible to ignore that this White House disdains research that inconveniences it.”

Shulman wrote *Undermining Science* “to underscore the issues at stake in more explicit and personal language”. Actually, his rhetoric



M. HUMPHREY/AP

The administration of George W. Bush has been widely attacked over its approach to science.

is mild compared with that of Chris Mooney, whose book *The Republican War on Science* (Basic Books, 2005) lambasts not just Bush officials but Republicans in general for their attitude towards science. Whereas Mooney delivers scathing profiles of such key figures as Bush’s science adviser John Marburger, Shulman sticks more or less to recounting the facts. That makes *Undermining Science* a valuable complement to *The Republican War on Science*. Shulman’s book serves as a concise, straightforward case history of the politicization of science, ideal for courses on the history, philosophy, sociology and ethics of science.

Shulman acknowledges that other administrations have introduced political calculations into scientific and medical matters. As the journalist Stephen Hall documents in his book *Merchants of Immortality* (Houghton Mifflin, 2003), the Bill Clinton administration impeded federal research on embryonic stem cells for fear of offending religious voters. Clinton also fired his surgeon general, Jocelyn Elders, in 1994 after she suggested that sex education should include information about masturbation.

Moreover, scientists are not always paragons of objectivity. Shulman quotes Harvard biologist Richard Lewontin: “Why should we trust scientists, who, after all, have their own political

and economic agendas?” But dwelling on run-of-the-mill scientific bias in the context of the Bush administration’s behaviour, Shulman argues, “is rather like conducting an argument about the extent to which pilots normally deviate from their flight plan while riding in an airplane that has just been hijacked”. Indeed, Lewis Branscomb, head of the National Bureau of Standards under the Republican President Richard Nixon, is quoted in *The Christian Science Monitor* on 6 January 2004 as saying: “I don’t think we’ve had this kind of cynicism with respect to objective scientific advice since I’ve been watching government, which is quite a long time.”

A few key episodes recounted by Shulman give a sense of the brazenness, if not the enormous scale, of the Bush administration’s tactics. In 2004, the White House dismissed the eminent biologist Elizabeth Blackburn, an outspoken proponent of research on embryonic stem cells, from the President’s Council on Bioethics. Blackburn was replaced by Diana Schaub, a political scientist who described research that led to the destruction of embryonic stem cells as “evil”.

The White House has also staffed its scientific agencies with people who openly question the agencies’ missions and punish employees for doing their jobs. Craig Manson, assistant

secretary for fish and wildlife and parks, once stated: "If we are saying that the loss of species in and of itself is inherently bad — I don't think we know enough about how the world works to say that." In 2004, on the day after Bush's re-election, the Fish and Wildlife Service, which Manson oversees, fired the biologist Andy Eller, who had charged that the service was not fulfilling its mandate of protecting the Florida panther, an endangered species. The agency was forced to re-hire Eller after a court ruled in his favour.

Some of the Bush administration's actions have been almost comically incompetent. Last January, for example, George Deutsch, a public-affairs officer at NASA, tried to prevent the space agency's James Hansen from speaking to the press about the dangers of global warming. Andrew Revkin of *The New York Times* quickly exposed the attempt to censor Hansen, and it was soon revealed that Deutsch, contrary to what it said on his CV, had never graduated from university. Deutsch resigned and NASA administrator Michael Griffin declared: "It is

not the job of public-affairs officers to alter, filter or adjust engineering or scientific material produced by NASA's technical staff."

But the damage caused by the Bush administration's contempt for scientific facts is no laughing matter. In the two years since Bush was re-elected, "reality" — especially the reality of Iraq, which, Shulman points out, the United States invaded on the basis of erroneous technical claims — has humbled his administration. In November, as the death toll in Iraq surged, voters handed the reins of power in Congress to the Democrats. In December, the Iraq Study Group, headed by the Bush family friend James Baker, issued a scathing critique of the US occupation of Iraq. Bush's approval rating has sunk to one of the lowest levels ever recorded. The declaration of that Bush official — "We create our own reality" — has now taken on a tragic irony. ■

John Horgan is director of the Center for Science Writings at the Stevens Institute of Technology, Hoboken, New Jersey. His most recent book is *Rational Mysticism*.

usually told by cosmologists and astronomers, energy plays the central role. First there was a singularity and there was no past for it to emerge from. Then expansion. As the Universe expanded, it cooled down and various forms of matter condensed out because the disruptive thermal energy gradually dropped below the binding energies that hold constituent parts of protons, nuclei and atoms together. Tiny quantum fluctuations made some regions of the Universe slightly denser, and gravity amplified this effect, which resulted in gas clouds, stars and galaxies. Stars exploding to supernovae produced heavier elements, then our Sun and Solar System formed, and about 4 billion years ago, life emerged on Earth. But this story leaves many questions unanswered. How did life arise? Why is the Universe so complex? Could such complexities have arisen from total randomness?

Now, enter computer science. Algorithmic information theory shows that there are short, random-looking programs that can cause a computer to produce complex-looking outputs. Lloyd illustrates this with a popular story attributed to the French mathematician Émile Borel. Imagine a bunch of monkeys typing randomly into typewriters. Given enough time, it is certainly possible that one of these monkeys will type the first million digits of π or the first act of *Hamlet*. Possible, but very unlikely. Now, take the typewriters away and give the monkeys computers that recognize any random inputs not as text but as a computer program. When the computers try to execute random programs, most of the time they will crash or generate garbage, but every now and then just a few lines of random code typed by monkeys will give interesting outputs — for example, the successive digits of π , or intricate fractals. Or perhaps much more interesting patterns if the computer is the Universe itself.

This vision of a computational Universe is

The Universe's quantum monkeys

Programming the Universe: A Quantum Computer Scientist Takes On the Cosmos by Seth Lloyd

Alfred A. Knopf/Jonathan Cape: 2006.
240 pp. \$25.95/£18.99

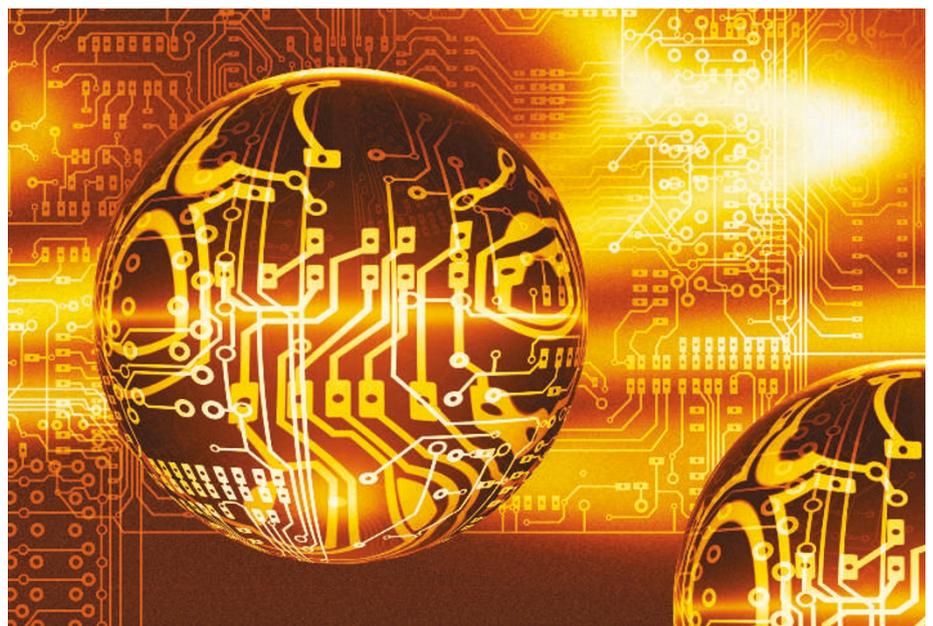
Artur Ekert

A little less than 14 billion years ago, a huge explosion gave birth to the Universe, and once it sprang into existence, the Universe began computing. The positions, velocities and internal states of every elementary particle, every atom and molecule, indeed every single physical entity register bits of information. Those bits are continually altered by physical interactions that act like sequences of logic gates — given a sufficient supply of bits and enough time, they can compute just about anything that is computable. Thus, the Universe is a computer. It is not a metaphor, it really is. More than that, the fundamental laws of physics that govern any interaction are quantum; hence, the Universe is a huge quantum computer that computes its own behaviour. It started in a very simple state initially, but in time, as the number of computational steps increased, the computing quantum Universe spun out more complex patterns, including galaxies, stars and planets, and then life, humans, you and me, and Seth Lloyd and his book *Programming the Universe*.

Like many other good stories of this type, Lloyd's book will puzzle and even irritate as much as it persuades. Lloyd writes in a lively style, weaving jokes and personal anecdotes into more technical narrative. He shares his views on cosmology, computation, quantum

physics, complexity, sex, life, the Universe and all that, and he does it well. Despite this proliferation of topics, the main message stands out and is reiterated several times — the Universe is a quantum computer programmed by quantum fluctuations, and the computational capability of the Universe explains how complex systems can arise from fundamentally simple physical laws.

Lloyd tells the story of the evolving Universe in terms of interplay between energy and information. In the conventional history of the origin and the evolution of the Universe, the story



M. KULIK/SPL

Get with the program: the Universe, it turns out, is actually a giant quantum computer.