SANG TAN/AP PHOTO

Anti-vaccination protesters in London in 2007.

EPIDEMIOLOGY

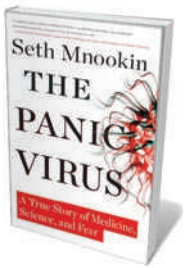
Epidemic of panic

Autism's broad diagnosis has fuelled fears about vaccines despite no evidence for a link, finds **Melvin Konner**.

Groundless suspicions that vaccines cause autism have an alarmingly long shelf life. The issue flared up again earlier this month, when an investigative report in the *British Medical Journal* documented fraud in a retracted 1998 paper in *The Lancet* by UK gastroenterologist Andrew Wakefield. It had alleged a link between the combined vaccine for measles, mumps and rubella (MMR) and autism. The anti-vaccine community once again defended Wakefield.

In just 50 years, we have moved from experts blaming parents to parents blaming vaccine scientists and paediatricians. As a boy in the 1960s, I worked at a school for children with autism, few of whom had language skills. In those days, parents were often held responsible for autistic behaviour — 'experts' referred to emotionally cold 'refrigerator mothers' and to 'double-bind mothering', which supposedly gave a child conflicting messages. The school where I worked, founded by US educator Carl Fenichel, opposed such theories, and I came to reject them, too.

Some parents of children with autism, unable to accept the question mark that science still places over the illness, think that they have found an answer in inoculations. In his disturbing chronicle, *The Panic Virus*, US writer Seth Mnookin looks into the anti-vaccine movement. His analysis is serious and gripping. Although diagnoses of autism are on the increase, all the evidence points away from vaccines being the cause. Yet calls to reduce or ban vaccinations in childhood remain strong. Public insistence on doing unjustified studies of vaccine effects, already well studied, simply diverts funds away from promising avenues such as genetics. Anti-vaccine sentiment also causes the needless spread of deadly diseases, such as measles and whooping cough, by reducing the coverage of mass immunization programmes. Immunization with the MMR vaccine peaked at 91% in the United Kingdom in 1997 and began to decline after the Wakefield *Lancet* paper. It was as low as 80% in 2003, but had crept back up to 86% by 2010. A level of 95% is considered adequate to protect those who are not immunized (herd immunity) so outbreaks are not surprising.



The Panic Virus: A True Story of Medicine, Science, and Fear
SETH MNOOKIN
Simon & Schuster: 2011. 410 pp. $26.99

Vaccine refusal can cause local immunization rates to fall, as implicated in measles epidemics in Britain, the Netherlands and Germany, and in the current whooping-cough epidemic in California. This epidemic, the state's worst in 50 years, has a dual demographic of undocumented Hispanic immigrants and people from rich white communities in which vaccine refusal is common. The disease has killed at least ten infants who were too young to have been immunized, and will spread to other states.

Possible causal links between vaccines and autism have been extensively studied, and none has been found. Mnookin describes how a panel convened in 2000 by the US Institute of Medicine (IOM) reviewed all the available data. As the finger of blame had shifted from thimerosal, a mercury-containing preservative, to the individual measles or mumps vaccines themselves, the panel carefully considered all possible causes.

The IOM is a respected independent arbiter, but even it took special care to ensure that none of its panellists — authorities on statistics, epidemiology, ethics and various medical fields — had been involved in vaccine development, testing or consulting. In 2004, the panel concluded that there was no evidence of a connection between vaccines and autism. The hate mail that the panel subsequently received led to an FBI investigation.

Among other evidence, the IOM considered a study of more than 530,000 children born in Denmark in 1991–98; a comparable national study in Sweden; large UK and US sampling studies; other well-designed studies; and all the studies on which anti-vaccination claims had been based. None of the studies in the last group was found to have merit, and the properly designed studies led the panel to favour rejection of the claims. There was no greater incidence of autism or autism spectrum disorders (ASDs) in vaccinated versus unvaccinated children, and the removal of thimerosal from vaccines had not reduced diagnoses of ASDs, which continued to increase.

The reasons for the autism increase are uncertain. Changing diagnosis is one possibility — as suggested in the book *Unstrange Minds* (Basic Books, 2007) by Roy Richard Grinker, a social anthropologist whose daughter has autism. Highlighting autistic traits to physicians, extending its diagnosis to milder and latent

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forms and a shift away from descriptions of 'mental retardation' to the less stigmatizing and more treatable ASDs may have increased its recorded incidence.

Mnookin's anti-vaccine cast includes the anguished parents, physicians, lawyers, celebrities and organizations that encouraged scientifically baseless beliefs. The best-known medical figure in the tale is Wakefield. Despite the UK General Medical Council ruling that he can no longer practice medicine in the country because he ordered medically unjustified procedures on children with autism, he is still considered a hero to some.

Citing cognitive research, Mnookin shows how repeating claims makes them seem true even if they are groundless, how belief in a hypothesis biases judgement and how ignorance of statistics breeds false inference. He could also have cited studies on false memories, which are easy to create and may help explain some parents' belated recollection of a temporal link between an inoculation and a child's first autistic symptoms.

Vaccine opponents point out that science can never be absolutely certain, especially about a negative. But it is close to certain that vaccines do not cause autism and that non-vaccination leads to epidemics. This suggests a course of action even if there are small doubts. Mnookin accepts that vaccines do occasionally cause harm; for example, attenuated live viruses can (rarely) cause serious cases of the illness being inoculated against, and an uncontrolled high fever can result in brain damage. Although there is no evidence that these risks include autism, he supports the no-fault system that compensates parents who can show that a child became seriously ill after a vaccination and was left with a listed medical condition, including autism.

Vivid stories about vaccines causing autism must be countered by equally vivid tales of the disability and death wrought by anti-vaccine sentiment. Herd immunity shields children whose parents reject vaccination's tiny risks, up to a point. But if many avoid vaccination, 'herd' protection is lost and others suffer. That includes teenagers and adults whose immunizations have worn off; children who are inoculated but still vulnerable (no vaccine is perfect); and infants who are too young for vaccination. Mnookin's description of the death of a four-week-old baby in Louisiana from whooping cough, caught from an unvaccinated older child, is painful to read.

Mnookin's careful science and compassion for both sides are examples for all journalists, and *The Panic Virus* should be read and pondered. ■

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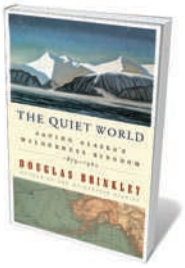
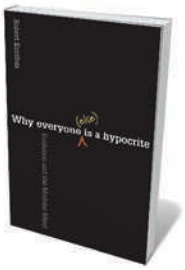
Books in brief

Academically Adrift: Limited Learning on College Campuses
Richard Arum and Josipa Roksa UNIVERSITY OF CHICAGO PRESS *256 pp. $70 (2011)*
With rising numbers of students paying increasing sums to attend university, two social scientists' finding that they learn little when they get there is sobering. In their study of 2,300 students at 24 institutions in the United States, Richard Arum and Josipa Roksa demonstrate that undergraduates displayed little advancement in a range of skills including critical thinking, complex reasoning and writing. They suggest that the many social distractions of campus culture hinder learning.

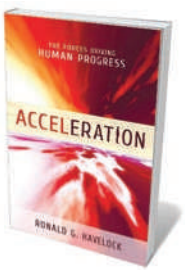


The Quiet World: Saving Alaska's Wilderness Kingdom, 1879–1960
Douglas Brinkley HARPER *592 pp. $29.99 (2011)*
The pristine Alaskan wilderness is at the centre of a tussle between environmentalists and the extraction industries. It has long been so, historian Douglas Brinkley reminds us. He documents attempts by the US federal government from 1879 to 1960 to protect wild areas of the state — including Mount McKinley, the Tongass and Chugach national forests, and the Coastal Plain of the Beaufort Sea. Drawing on new archival material, he describes the colourful characters who established the Arctic National Wildlife Refuge in 1960.



Why Everyone (Else) Is a Hypocrite: Evolution and the Modular Mind
Robert Kurzban PRINCETON UNIVERSITY PRESS *288 pp. $27.95 (2011)*
We are all hypocrites, according to psychologist Robert Kurzban. Because of the different ways in which various regions of our brains have evolved, he explains, our actions are riddled with inconsistency. Using humour and anecdotes, he reveals how conflict between the modules of the mind leads to contradictory beliefs, vacillating behaviours, broken moral boundaries and inflated egos. He argues that we should think of ourselves not as 'I' but as 'we' — a collection of interacting systems that are in constant conflict.

Hot: Living Through the Next Fifty Years on Earth
Mark Hertsgaard HOUGHTON MIFFLIN HARCOURT *352 pp. $25 (2011)*
Concern for his daughter's future drives journalist Mark Hertsgaard to consider the impacts of climate change over the next five decades. Focusing on the United States but including reports from around the world, he explains how Chicago's climate may come to resemble Houston's, how coastal cities such as New York will have to tackle rising sea levels and frequent storm surges, and how water shortages and altered crop yields will affect people around the globe. He argues that human survival will depend on citizens to push for government action.



Acceleration: The Forces Driving Human Progress
Ronald G. Havelock PROMETHEUS BOOKS *363 pp. $28 (2011)*
Countering fears about humanity's survival, social psychologist and knowledge-transfer consultant Robert Havelock argues that progress is accelerating. His focus is the creation and dispersal of knowledge, the increasing rate of which he tracks from the Stone Age to the present. Rather than worrying about particular threats such as global warming and nuclear proliferation, he argues that in the long term, the sharing of information across global society is a force for good that enhances well-being.