Baby boom: new arrivals at a London hospital in 1945.

PUBLIC HEALTH

Tracing the social roots of health

Andrew Steptoe applauds a cogent exploration of Britain's groundbreaking longitudinal birth-cohort studies.

Helen Pearson's fascinating *The Life Project* examines the history and legacy of the British birth-cohort studies, the first of which launched 70 years ago. These longitudinal investigations follow large samples of people 'recruited' as infants, periodically gathering data relevant to social and psychological development, schooling, employment and mental and physical health.

These studies — of, collectively, some 70,000 people — have played a crucial part in identifying how socio-economic circumstances drive inequalities in health and development. They have informed health, education and social policy, and provided a template for the 'life course' approach to health and development, studying how early experiences shape later outcomes. They are the envy of the world, and have contributed to topics as diverse as the perinatal determinants

of adult health, the establishment of free nursery places for British 3- to 4-year-olds and the drive to promote adult literacy and numeracy.

Pearson, *Nature's* chief features editor, reveals that the studies emerged haphazardly. The first — the National Study of Health and Development (NSHD), following 5,362 people born in England, Scotland or Wales in 1946 — was stimulated by 1930s concerns about the falling birth rate, but began, ironically, at the start of the post-Second World War baby boom. The National Child

The Life Project: The Extraordinary Story of Our Ordinary Lives
HELEN PEARSON
Allen Lane: 2016.

Development Study (NCDS), following 17,000 people born in 1958, aimed to address perinatal mortality, and collected data on deaths as well as live births. Perinatal health was also a major issue for the British Cohort Study (BCS70), following 17,000 born in 1970. The Millennium Cohort Study (MCS) follows 19,000 people born in 2000–02. Pearson also covers the local Avon Longitudinal Study of Parents and Children (ALSPAC) in southwest England — which focuses on 14,000 women recruited while pregnant in 1991–92, and their children. In addition, she looks at the Life Study, which was planned to begin in 2012 but never got off the ground.

Along with providing key information about maternal and neonatal health, the studies evolved wider remit. James Douglas, first director of the 1946 study, set the standard by collecting data on social and economic conditions, father's occupation, diet, health, temperament and behaviour, as well as birth weight and infant health and survival. Each cohort developed its own identity, a product of the principal investigators' interests and the era in which it was launched. As the NSHD's cohort turns 70 this year, the study is embracing detailed measures of brain function, cardiovascular activity and physical capability. ALSPAC, begun by epidemiologist Jean Golding in the era of molecular medicine, included collection of DNA and other biological samples from the beginning. BCS70, by contrast, is collecting biomarkers for the first time this year, when its participants are 46.

The NCDS moved towards social issues such as education when formidable educational psychologist Mia Kellmer Pringle took the lead. Its findings on the enduring impact of social and economic adversity on child development have fed into national debates about social mobility and cycles of deprivation. The MCS, initially led by demographer Heather Joshi, is now being used to investigate emerging twenty-first-century issues, such as the growth of childhood obesity, parental involvement in learning and the impact of birth season on educational attainment.

Some of the studies have had a bumpy ride, as Pearson relates. The 1946 cohort is overseen by the UK Medical Research Council (MRC), and this ensured regular assessment throughout childhood. But contact was not maintained with the 1958 sample, so participants had to be traced from scratch for data sweeps at ages 7 and 11. The BCS70 launched with funding from 23 organizations, then was virtually appropriated by the ebullient but eccentric paediatrician Neville Butler. He was able to continue the study by cobbling together funding from diverse sources such as wealthy aristocrats, philanthropists, actors and celebrities. He designed many of the data sweeps himself — and published results sporadically. The study almost fell off the map until it was rescued by the Social Statistics

Research Unit at London's City University in 1996. Perhaps even more extraordinary was the MCS, a mainly political initiative by the government of then-prime minister Tony Blair, devised to celebrate the millennium. Funding was not agreed until early in 2000, so planning was rushed and the design far from ideal: when the participants were recruited, the babies were already nine months old.

Pearson concentrates on social history rather than research findings, although she does highlight impacts on social and educational policy and medical practice. This is wise, because the science is difficult to synthesize: thousands of papers have been written on the studies' biomedical, social, economic and educational ramifications. Pearson inserts stories of participants such as Steve Christmas of the 1958 cohort, who overcame the disadvantages of a limited education with hard work and determination. These provide vivid accounts of growing up in different decades, and the roles of educational opportunity and psychological outlook in shaping lives.

As Pearson explains, the studies have had to fight for funding, owing in part to a tension between the need to maintain a sequence of measurements to understand how people change as they age, and the need to generate new hypotheses and collect new data in every funding period. At one time or another, each investigation was at risk of disbanding.

Which brings us to the melancholy tale of the Life Study. Planned by paediatric epidemiologist Carol Dezateux to begin in 2012 with

"Findings on the enduring impact of social and economic adversity have fed into national debates."

80,000 participants, the project aimed to take detailed measurements including data on air pollution, mobile-phone use and water quality; samples of blood, urine, saliva and faeces; and

recordings of behaviour. It was immensely complex, balancing the demands of medical and social scientists, and costs spiralled. Recruitment finally began early in 2015, but uptake was low, and the UK Research Councils withdrew funding within months.

It seems likely that there will be no new national birth cohorts any time soon. Yet it is encouraging that major funders such as the MRC and the Economic and Social Research Council have recognized the value of such studies. They are an important national research resource, and *The Life Project* does a great service in bringing them and the people at their heart to life for a general readership. ■

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Books in brief

Dark Territory: The Secret History of Cyber War

Fred Kaplan SIMON AND SCHUSTER (2016)

Beyond the bombs and drones of on-the-ground warfare, a shadow conflict is playing out in a virtual theatre of war. Covert cyberattacks — the hacking of digital systems that control everything from dams to centrifuges in uranium-enrichment facilities — are a new norm. Pulitzer-prizewinning journalist Fred Kaplan's taut, urgent history traces the dual trajectory of digital surveillance and intervention, and high-level US policy from the 1980s on. In 2014 alone, he reveals, almost 80,000 US security breaches occurred — an artefact of the very network connectivity that enriches the country's economy.

Being a Beast

Charles Foster PROFILE (2016)

Humanity's obsession with animals spans shamanic 'possession' by wolves and a hefty tranche of children's literature. Charles Foster's contribution might just stand alone. In his exquisitely strange, often hilarious chronicle, the writer recounts neuroscientific self-experiments centred on immersion in the sensory maelstrom experienced by iconic British species. He gets down and dirty, chomping earthworms and sleeping in a homemade sett (badger); honing his olfaction and attempting to hunt voles (urban fox); and parachuting (swift). A bold, unsettling try at comprehending the rest of life on Earth.

Meathooked

Marta Zaraska BASIC (2016)

From char siu to boeuf bourguignon, meat has us hooked, proves journalist Marta Zaraska. Starting 1.5 billion years ago, when one bacterium first engulfed another, she zips through the evolution of human carnivory and examines the enduring pull of animal flesh by way of genetics, developmental biology, chemistry and nutrition. Zaraska negotiates the complexities nimbly, from meat's pivotal part in building our big brains to the 1,000 substances that underpin its cooked odour (3-octen-2-one, for instance, smells of "crushed bugs") and the unpalatable influence of the industry on research.

Raptor: A Journey Through Birds

James Macdonald Lockhart FOURTH ESTATE (2016)

Fifteen species of raptor — from hen harrier to red kite — form nuclei for the crystalline narratives of this meditation on the British wild, a winner of the 2011 pre-publication Jerwood Award for Non-Fiction. James Macdonald Lockhart grew up knowing birds through photographs shot by his great-grandfather, Seton Gordon. His own understanding of raptor ethology shines. His journey — intercut with passages by Victorian ornithologist William MacGillivray — flings us into skies where a hobby 'concertinas' the air, or a marsh harrier's ruff give it the air of an Elizabethan grandee.

Eco-Homes: People, Place and Politics

Jenny Pickerill ZED (2016)

We have the science, technology and political will to build eco-housing — as well as to retrofit our not-so-green abodes. What stops us? The greatest hurdle is often cultural adaptation to a new norm, concludes environmental geographer Jenny Pickerill in her cogent sociopolitical work. Focusing on self-build eco-housing, Pickerill looks at more than 30 case studies from a range of countries, along with lessons learned on construction materials, geography and climate, gender, costs and the right policy for rapid rollout. **Barbara Kiser**