

inequality, and the despair of unmet expectations that it has induced in many white Americans, is almost certainly behind the opioid crisis in small towns and rural areas. There, life expectancy is declining much as it did in the final years of the Soviet Union, where rising alcohol addiction took a grim toll.

Inequality is even more serious for African Americans, for whom neglect and mistreatment in medical care, education, housing and criminal remand have resulted in an average lifespan half a decade shorter than that of white people in the United States, although the gap is closing.

Among the biggest global problems Diamond mentions are the risk of nuclear war and the fact of climate change. Here, his answers are conventional. No one knows what to do about nuclear weapons, maintained as they are under the pretence that they deter the very disaster they are designed to produce. On climate change, Diamond recognizes the double challenge of reducing greenhouse-gas production while meeting the rising expectations of the developing world. But he fails to recognize that substituting renewable energy for fossil fuels without a major expansion of nuclear power will merely decarbonize the existing supply. Without nuclear power, the doubling of demand projected for the developing world in the next 30 years will be met mainly through coal — or, at best, natural gas, which produces fully half as much carbon dioxide as coal when it burns.

Diamond's historical analyses hold up better than do his contemporary assessments. Energy from fossil fuels supported the West's transformation from subsistence to long-term prosperity; today, it threatens to cook our goose. The nation-state system, embedded in international anarchy, has never dealt well with global threats. So far, the response has mostly been denial and timidity: tragedy of the commons indeed.

I read *Upheaval* with appreciation for its historical sweep and its generally informed speculation. If the world is going to hell in a handbasket, Diamond has not given up hope that we can change course. ■

Richard Rhodes's latest book is *Energy: A Human History*.

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MEDICINE

Sorrows of psychiatry

Alison Abbott probes a history on the fraught nexus of mental illness and biology.

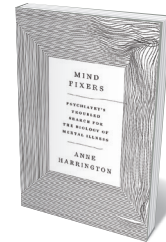
In January 1973, *Science* published an article called 'On being sane in insane places'. The author, psychologist David Rosenhan, described how he and seven other healthy people had reported themselves to a dozen psychiatric hospitals, claiming to hear voices uttering odd words such as 'thud' or 'hollow' — a symptom never reported in the clinical literature. Each person was diagnosed with either schizophrenia or manic-depressive psychosis, and admitted; once inside, they stopped the performance. They were released after an average of 19 days with diagnoses of 'schizophrenia in remission' (D. L. Rosenhan *Science* 179, 250–258; 1973).

One research and teaching hospital, hearing about the study, declared that its own staff could never be so deceived. It challenged Rosenhan to send it pseudopatients. He agreed, but never did. Nonetheless, the hospital claimed to have identified 41 of them.

Psychiatric hospitals, it seemed, could recognize neither healthy people nor those with mental illnesses. Rosenhan's study exemplifies much of what went wrong in twentieth-century psychiatry, as biologists, psychoanalysts and sociologists struggled for supremacy. Science historian Anne Harrington takes us through the painful history of that struggle in the enthralling *Mind Fixers*, which focuses particularly on the United States.

She reveals the shameless hubris of many of the prominent battlers. She fails, however, to acknowledge promising approaches in biological psychiatry, particularly very new insights about brain circuitry as a potential target for treatment. Many neuroscientists today are very aware of past mistakes in overclaiming the power of theories and drugs. In my opinion, Harrington's omission weakens the case for her pessimistic conclusion.

She begins in mid-nineteenth-century Europe, with a new experiment to give people with psychosis rest and care, with no



Mind Fixers: Psychiatry's Troubled Search for the Biology of Mental Illness
ANNE HARRINGTON
W. W. Norton (2019)

restraint, rather than the standard brutality and neglect of the conventional 'lunatic asylum'. It visibly failed.

By the 1870s, asylums had become overpopulated, and gave up all pretence of being therapeutic. They began to supply post-mortem brains to any scientist wishing to investigate a possible anatomical basis for mental disorders.

These turned out to be unrevealing. Harrington describes how the failure encouraged Sigmund Freud to turn away from neuroanatomy in the 1890s to develop his theory that mental disorder is rooted in biography — specifically, early-childhood sexual fantasies. These, Freud thought, needed only to be drawn out by intense psychoanalysis to achieve a cure.

At the same time, Harrington shows, the German psychiatrist Emil Kraepelin began a large-scale, systematic survey to categorize symptoms such as hallucinations or extreme moods. Without proper diagnostic criteria, he reasoned, clinical science would never make progress. In 1899, he published the sixth edition of his influential textbook *Compendium of Psychiatry*, which distinguishes disorders — particularly, psychoses such as schizophrenia and affective disorders including manic depression, now known as bipolar disorder. (Kraepelin was also interested in eugenics, like many intellectuals of the time.)

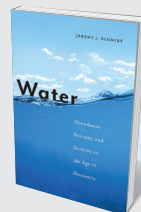
In the following decades, biologists and Freudians cut separate paths, for good or ill. Certain discoveries, such as the findings in 1897 and 1913 confirming that syphilis causes late-onset psychosis, bolstered biologists' view that mental disorders were brain-based. Some



The Value of Everything

Mariana Mazzucato PENGUIN (2019)

A crisis faces capitalism, argues economist Mariana Mazzucato. She reveals that we value those who extract wealth over those who create it. Noting that the debate is economic, social and political, she pinpoints the urgent need to reform how we define value in a fast-changing world.



Water

Jeremy J. Schmidt NEW YORK UNIV. PRESS (2019)

Humans both consume too much water and fail to benefit from it equitably. Geographer Jeremy Schmidt's multidisciplinary study shows how historical US approaches to water management have gained global reach, leading to problematic biases. [Mary Craig](#)



tried out crude therapies, such as inducing fever through malaria infection. They applied electric shocks to people's brains (the only such therapy still used, although in a more controlled form and only for treatment-resistant depression), and they invented the dire 'treatment' lobotomy (see C. Lüscher *Nature* 555, 306–307; 2018).

Worse followed. Theories that mental illnesses were hereditary led to an egregious US programme in the 1920s and 1930s in which 28,000 people deemed mentally deficient were sterilized. The Nazi regime in Germany referenced this in support of its own eugenics programme targeting people they saw as mentally disabled, which began with sterilization and ended with murder (see S. Baron-Cohen *Nature* 557, 305–306; 2018).

As Harrington relates, the horrors of two world wars generated hundreds of thousands of cases of what we now call post-traumatic stress disorder, indicating a clear role for environmental triggers for some mental illnesses. By the 1970s, the Nazi eugenics atrocities had led most US psychoanalysts to disdain biological approaches even more vehemently, but their reasoning caused its own distress. They extended Freud's view that mental disorders were rooted in early sexual fantasies to encompass all causes of early childhood anxieties. The idea that families, particularly mothers, were to blame for unexplained mental conditions such as psychoses became mainstream. By the 1950s, psychoanalysts dominated US psychiatry teaching.

Around this time, notes Harrington, social scientists emerged as the third influential force, aligning with psychoanalysts on the purported role of 'toxic' families in causing

psychiatric disease. Yet within a decade, US psychiatrists experienced a backlash — both from patients' families, fed up with being vilified, and from the professional ranks. What's more, a 1962 study showed that two psychiatrists disagreed on the diagnosis of the same person 70% of the time (A. T. Beck *Am. J. Psychiatry* 119, 210–216; 1962).

By the 1980s, psychoanalytic approaches were in decline; biological approaches started to look more attractive. Harrington takes us on a fascinating tour of the up-and-down history of pharmaceutical treatments for

PSYCHIATRY HAS HIT ITS ROADBLOCK BECAUSE WE KNOW TOO LITTLE ABOUT HOW THE BRAIN FUNCTIONS.

psychiatric disorders. Who knew, for example, that lithium — still the mainstay drug for bipolar disorder — was once a key ingredient in the original recipe for the soft drink 7 Up, possibly included to give imbibers a lift? Harrington pays scant attention, however, to the fact that various drugs, such as chlorpromazine, allowed serious psychoses to be brought under control for the first time — albeit incompletely, and at a high cost of

harrowing side effects. The drugs also enabled the demonstration that biochemicals such as neurotransmitters are involved in mental disorders, even if their role turned out to be more complicated than originally thought.

By the 1990s, it was clear that major advances had stalled, and that psychiatrists' diagnostic criteria (for example in the US *Diagnostic and Statistical Manual of Mental Disorders*, introduced in 1952 and now in its fifth edition) were less than helpful (see D. Dobbs *Nature* 497, 36–37; 2013). The pharmaceutical industry, after a series of stymied attempts to squeeze more profit from their ageing arsenals, pulled out of psychiatry.

This is where Harrington stops. She argues, unconvincingly, that the burden of mental disorders should be divided up: psychiatrists should devote themselves to solving the problem of serious psychoses, and should concede responsibility for what she describes as mental suffering that is not a true illness to therapists and social workers.

I disagree. This is the time for all parties to join forces. What the research of the past decades has shown us most convincingly is that biology and environment work powerfully together on the brain and the mind — and that psychiatry has hit its roadblock because we know too little about how the brain functions. Professionals need to advance with respect for both the limits of our understanding and the modest knowledge we have gained in the twenty-first century. The road to better therapies might be rocky, but in my view there is little reason for pessimism. ■

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