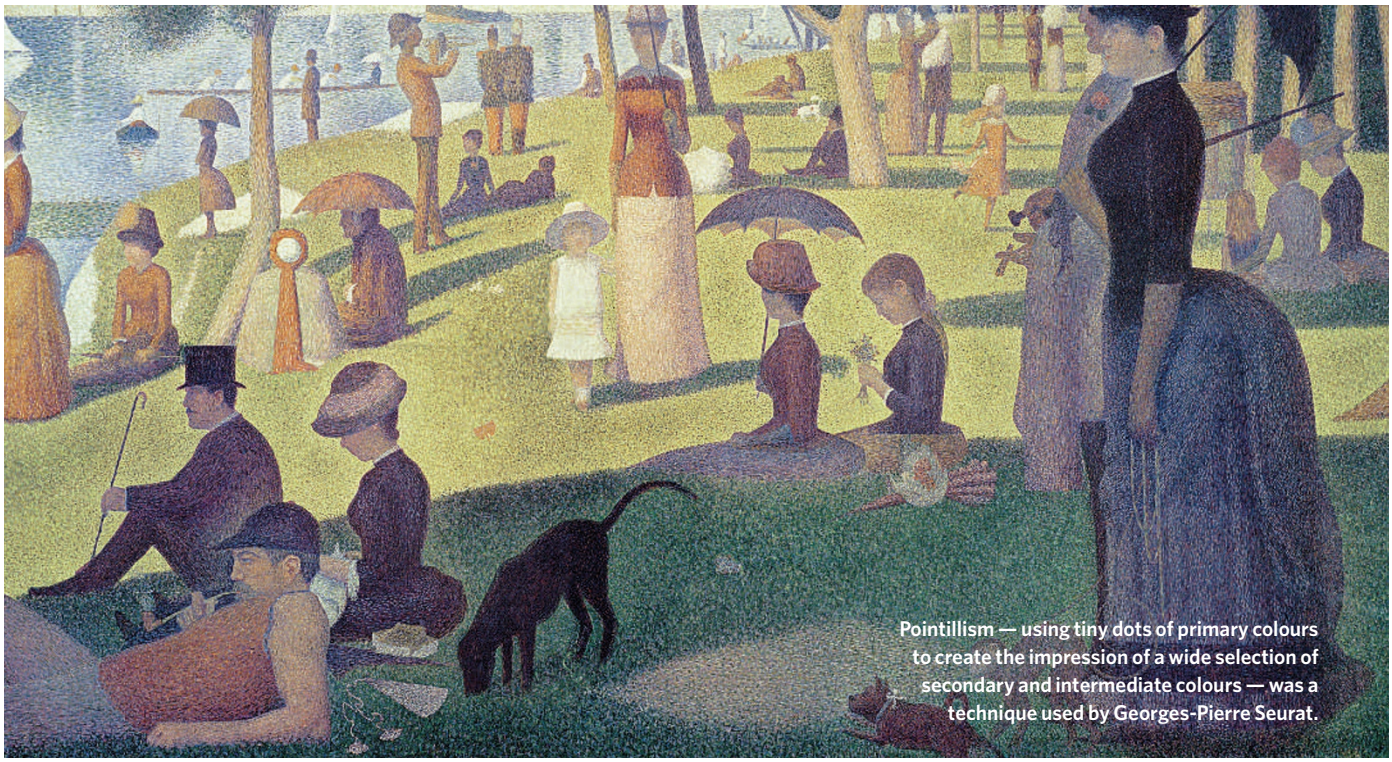
# BOOKS & ARTS



Pointillism — using tiny dots of primary colours to create the impression of a wide selection of secondary and intermediate colours — was a technique used by Georges-Pierre Seurat.

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# An illusionary rival

## Is our perception of the world a fantasy created by the brain to coincide with reality?

**Making up the Mind: How the Brain Creates Our Mental World**
by Chris Frith
Blackwell: 2007. 232 pp. $24.95, £14.99

**Siân Ede**

In *Making up the Mind*, professor of neuropsychology Chris Frith chooses as an occasional audience a fictional professor of English whom he meets at an academic party. This "opinionated" woman "doesn't accept that studying brain activity can tell you anything about the human mind", he tells us. And at intervals she pops up, a sceptical adversary, embodying some generalized idea the scientist has of his literary peers, perhaps as postmodernist obscurantists or, in this case, as a vaguely unreconstructed freudian. I am not sure how Frith (or his brain) dreamed her up, but she is the one unconvincing presence in an otherwise informative and genial book — and one longs to give her the push, or at least a plausible voice of her own.

For a start, she should already be fascinated by accounts of brain activity, possessing dog-eared copies of Oliver Sacks' books and of Richard Gregory's *Eye and Brain*. She would have been amused by the breezy confidence of Steven Pinker, Susan Greenfield and V. S. Ramachandran, made politically wary by Steven Rose, and challenged by the conflicting philosophical musings of Daniel Dennett, John Searle and Galen Strawson, who regularly feature in literary journals.

António Damásio's books would be a favoured source, and she might well be teaching her students about neuroscience as a subject for literary writing, as illustrated by Paul Broks, David Lodge and A. S. Byatt. She would have engaged with contemporary deliberations about the hard question, the illusion of self, the enigma of free will and the nature of consciousness. My guess is that she would be irritated by Chris Frith's assumptions about her intellectual prejudices and would in fact enjoy discussing his revelations in order to apply them to her own subject.

Frith's central thesis is that our brains create an illusion both of the world we inhabit and of our sense of personal autonomy while moving about in it — "a fantasy that coincides with reality". Of course, the English professor would have agreed, for haven't Kant, Wittgenstein, Merleau-Ponty and many others made similar claims, and aren't writers and artists engaged continually with the same idea?

We use our incomplete perceptions of the world as clues for building hypotheses about the way it feels and looks, drawing on information that is partly hard-wired, partly acquired and then recreated as plausible — or eccentric, in the case of people with brain dysfunction, or of those who are literary creations. Learning about the mechanics of the brain in receiving and remaking such impressions adds to our understanding of the creative imagination.

Frith provides plenty of striking examples. It is intriguing to learn why patients with phantom-limb syndrome or with brain damage can experience sensations and 'visions' that seem convincingly real to them. It is astonishing that in anyone, simply imagining an action stimulates the same brain regions that function when the action is actually undertaken.

Frith lucidly explains the mechanisms of social communication. This will strike a chord with dancers collaborating with neuroscientists on the function of mirror neurons, which are key to our ability to empathize with and mimic each other's actions. Literary practitioners would love to understand how vivid sensations are evoked through words alone and would appreciate the stories Frith tells us about patients in the one area of scientific enquiry where a subjective account of

experience is both well documented and scientifically pertinent.

Of course, scientists need to be rigorously objective too, which is why investigations are often reduced to a narrow focus. Although our English professor might accept the elimination of contextual variables, she would be most surprised by Frith's conviction that scientific enquiry can ultimately reveal "how the world truly is" through developing increasingly plausible models of it — the subject of a section in his final chapter.

Frith draws similarities between the brain's use of partial information to devise its world view and the practice of science itself. But if this is an interpretation based on illusion, does that not suggest that truth, too, is a fabrication, and is distorted by an anthropomorphic perspective? A glimpse at the history of science shows that models of how the physical world 'works' have often been debunked. Indeed, the discipline of neuroscience itself attracts a broad range of investigators — from researchers into artificial intelligence through to quantum theorists and panpsychists — whose suppositions about what 'works', and how, may be wildly different. One doesn't need to be a cultural relativist to desire a deeper level of discussion at this point.

Frith makes an innovative, if brief, speculation about the potential for a hermeneutics of neuroscience — that is, an investigation into the ways in which theories can be variously interpreted. His chapter is entitled 'How the Brain Creates Culture', but it is equally valid to ask to what extent culture creates the brain. Although some human perceptions and behaviours are undoubtedly hard-wired and autonomic, many others are acquired, not just in infancy when the brain is particularly plastic, but later in life too. The cultures we inhabit, besides the associations that we acquire as individuals, surely colour the ways in which we perceive the world — and how we form ideas about our mental processes.

Frith's approach confirms that our world picture is influenced by what Richard Gregory calls "the prevailing perceptual hypotheses", by different motivations, contexts and cognitive habits, and also, surely, by different cultural values and beliefs. This book proposes a subject that is ripe for investigation and it is one that might be productively shared by both sides, without drawing battle lines between those who are searching for one understanding of the mind and those who relish multiple explanations. ■

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# Two camps at cross-purposes

**Toxic Exposures: Contested Illnesses and the Environmental Health Movement**
by Phil Brown
Columbia University Press: 2007. 392 pp. $29.50

**Paul D. Blanc**

Reading Phil Brown's *Toxic Exposures* caused me to revisit C. P. Snow's seminal essay, *The Two Cultures*. Snow, writing almost 50 years ago, addressed what he perceived as a dangerous gulf between the world views of scientists and non-scientists. Snow's principal concern was how educational reform might bring the two camps closer. Although Brown is narrowly focused on selected human health effects (specifically breast cancer, childhood asthma and Gulf War illnesses) in relation to environmental exposure, his book implicitly concerns the ways in which scientists and non-scientists communicate and, more to the point, how they often speak at cross-purpose.

Brown comes to his subject matter from the social sciences, relying heavily on a qualitative approach informed by ethnography. He takes theoretical guidance from systematic critiques of the health-care system, such as *Professional Dominance: The Social Structure of Medical Care* (by Eliot Freidson) and *The Social Transformation of American Medicine* (by Paul Starr). Central to the thesis of *Toxic Exposures* is a construct that Brown labels the 'dominant epidemiological paradigm'.

Brown intends this phrase to serve as useful shorthand for a conservative biomedical mindset that should be rejected, a mindset in which disease is narrowly seen as a matter of treatment and where causation is of interest (if it is taken into account at all) only insofar as personal lifestyles are concerned. Here Brown may have put himself, and his readers, into a semantic double-bind. Epidemiology is inherently preoccupied with aetiology — the investigation of the causes and origin of a disease. The fairly recent emergence of 'clinical epidemiology' does indeed concern itself with treatments and outcomes, underscoring its differentiation from the parent discipline. Moreover, for most epidemiologists the supposition that personal lifestyle risk factors take exclusionary precedence over environmental factors remains to be established.

To support his argument, Brown takes a quite narrow view of what constitutes an environmental toxic exposure, basically limiting this to either an ambient air- or waterborne anthropogenic substance. Most epidemiologists are more catholic in their approach to defining the environment. Brown, for example, dismisses indoor air exposure as a valid environmental issue, without a convincing rationale for doing so. Indeed, he is explicitly critical of epidemiologists for being overly focused on indoor air quality. But this proscriptive approach does not even take into account second-hand cigarette smoke, one example of an indoor-air environmental exposure that is highly relevant both to asthma, and, as recent data suggest, breast cancer.

*Toxic Exposures* does shed light on the intersection of health research, advocacy and policy-making. Participatory research features prominently in this mix, although Brown does not purport to provide methodological guidance, and it would not be reasonable to expect this from his socio-ethnographic approach to the subject. (For a practical summary of core methods, see *Social Epidemiology: Strategies for Public Health Activism* by Julie Cwikel.) Nor should Brown be criticized for a geographical focus almost exclusive to the northeastern United States, given the logistical requirements of the ethnographic methods used.

S. DAS/REUTERS

**Arsenic-contaminated water affects hundreds of thousands of people in the Indian subcontinent.**