

BOOKS & ARTS

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A Palestinian confronts an Israeli policeman, but 'psychological' barriers make violent behaviour infrequent.

A close look at conflict

Psychology, neuroscience and physiology are missing from a new sociological study of violence.

Violence: A Micro-Sociological Theory

by Randall Collins

Princeton University Press: 2008. 584 pp.
\$45.00, £26.95

Margo Wilson & Martin Daly

Violence matters. It has been scrutinized by numerous researchers, from anthropologists to zoologists. Yet virtually all the discoveries and insights so accumulated — including those from sociology — get short shrift in this ambitious book. Author Randall Collins discusses “at least 30 types of violence”, from bullying and domestic violence, through staged fair fights and contract killings, to gang fights, sporting brawls, riots, police brutality and warfare. He draws on a vast opportunity sample of photographs, documentary films, and participant and witness accounts. Nevertheless, his agenda is tightly focused. He gives all these phenomena the same two-component ‘micro-sociological’ analysis.

First, Collins describes the action in some

detail — facial expressions, body postures, approaches and retreats, the brandishing and use of weapons. It is refreshing that he should tout the value of watching one’s study animal, for with a few notable exceptions, such as Erving Goffman, sociologists have evidently done too little of this. The ethological study of confrontation and aggression has a long and fruitful history in non-human animals and human beings, especially children. Statistical studies (using sequential analysis) of social interactions are well developed and have yielded significant results. The risks of subjectivity and arbitrariness have been countered by careful quantification and by assessing inter-observer reliability. Collins’s descriptive agenda would benefit from attention to the efforts of these predecessors.

The second component of Collins’s ‘micro-sociological’ analysis is an attempt to explain what is happening in terms of inferred emotional states and processes. The hypothesized emotional processes — ‘entrainment’, ‘interac-

tion ritual chains’, ‘forward panic’ — are central to the book’s theory and are apparently original. Unfortunately, Collins does not define them sharply, nor does he make an explicit case for their validity.

One big theme of this book is that “violence is hard”. Collins makes a persuasive case for there being psychological barriers to violent behaviour that make it infrequent, inefficient and emotionally fraught. For example, he reviews at some length the substantial evidence that only a minority of soldiers fire their weapons or otherwise strike in combat situations, and that even fewer do so effectively. Similarly, in street riots or demonstrations, only a small minority are actively violent.

However, Collins creates a straw man when he asserts that all existing explanations “assume violence is easy once the motivation exists”. This is a fair criticism of Hollywood portrayals, but not of the scientific literature, in which the infrequency of damaging violence has been much remarked on in studies of both human

and non-human conflict. Collins rightly stresses that confrontations seldom progress beyond threat and bluster, and he is right to ask why. His answer is, at best, shallowly descriptive: "No matter how motivated someone may be, if the situation does not unfold so that confrontational tension/fear is overcome, violence will not proceed." Factors that allegedly facilitate overcoming this "tension/fear" are the expressions, postures and behaviour of the other party, numerical or technical advantage and the support of an audience.

Again, much of this is not news. Threat displays, bluffing and audience effects on violence all have literatures of their own. It is 35 years since John Maynard Smith and George R. Price provided, in these pages (*Nature* **246**, 15–18; 1973), a game theoretical analysis of why threat displays are common and damaging violence is rare. Posturing conveys information about both fighting ability and the individual-specific

value of winning a contest. Violence is "hard" because it endangers the perpetrator as well as his target.

Sociologists often defend the autonomy and importance of their discipline by disparaging 'psychologizing'. To his credit, Collins realizes that phenomena such as emotions are essential components of a satisfactory explanation of human behaviour. Yet, perhaps to retain his sociological 'cred', he eschews consideration of current knowledge in psychology, physiology and neuroscience. He ignores a vast body of emotion research with direct implications for his theory, and much highly relevant work on the relative importance of situational versus individual attributes in the variability of behaviour. Moreover, Collins resurrects the notion that motivation is a sort of 'energy' that can be dammed up only to spill over into irrelevant activities, without acknowledging the devastating critiques by Robert Hinde and others that

led to the rejection of such Freudian/Lorenzian models in the 1960s. Collins's goal of characterizing the micro-dynamics of social interaction is laudable, but he is blinkered by disciplinary parochialism.

Does Collins really have the 'theory' his subtitle promises? If so, it is not one from which any testable hypotheses flow — theory here seems closer to its meaning in the humanities than in the sciences. Reading the book in this spirit, one finds keen observations and persuasive interpretations of aspects of police violence, domestic abuse, gang fights and the behaviour of men at war. But the road to a scientific understanding of violence is interdisciplinary. ■

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The invisible revolution

Nanosciences: La Révolution Invisible

By Christian Joachim and Laurence Plévert
Seuil: 2008. 182 pp. Can\$31.95, €18
(in French)

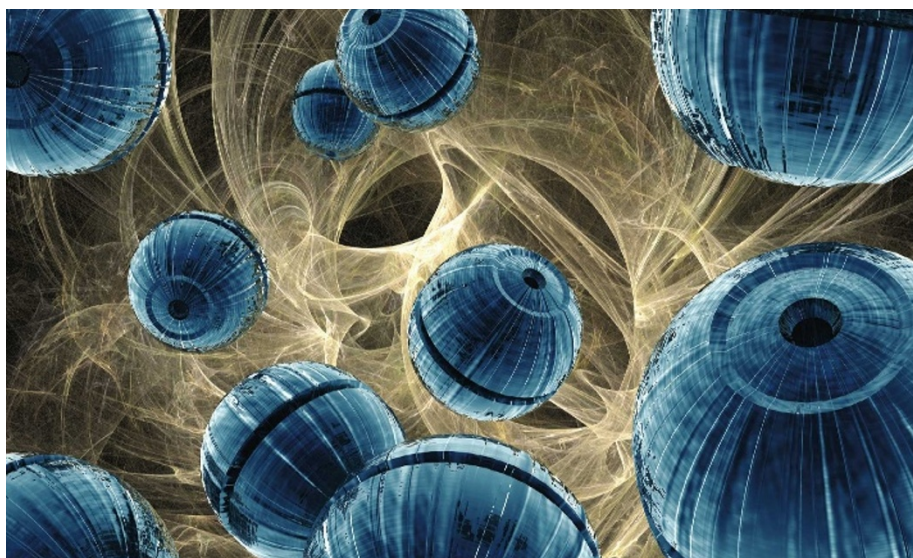
Vincent Dusastre

Nanotechnology was originally defined in the 1970s as the science of manipulating atoms and single molecules. Its remit has since expanded to embrace all technologies capable of building structures at the scale of a billionth of a metre. How and why did this change happen and has it affected the field's development?

Politics and big business caused the shift, according to physicist Christian Joachim and journalist Laurence Plévert. In their French-language book they argue convincingly that this more inclusive definition has also altered the initial goals of nanotechnology research.

Richard Feynman's 1959 lecture, 'There's Plenty of Room at the Bottom', touched on the difficulties of controlling matter at the atomic scale. But the term nanotechnology was first coined by Norio Taniguchi, at Tokyo Science University, in 1974. This was about the same time that Ari Aviram and Mark Ratner, at IBM, proposed the idea of a single-molecule rectifier.

In the early 1980s, the invention of the scanning tunnelling microscope, which could image and manipulate single atoms, made it possible to design nanoscale machines from individual atoms and molecules. Joachim, who worked as a young researcher at IBM at that time, takes us on a nostalgic personal journey from single molecules to today's molecular machines, such as organic molecules capable of moving and performing calculations. Given the visual interest of the tiny machines, it is a



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Molecular-scale machines could one day have medical applications such as removing cancerous cells.

pity that his gripping story is not illustrated.

Until the 1990s atomic manipulations were developed with sustainability in mind. Hope was that building machines from the bottom up, atom by atom, rather than top down, etching them from larger blocks, would minimize the energy and materials expended in manufacturing. US industrial lobbies then broadened the definition as a way of accessing public funds earmarked for materials and chemistry research and development. These lobbies convinced the Clinton administration to launch the National Nanotechnology Initiative in 1999, which fostered energy-intensive top-down techniques for fabricating and sculpting objects less than a micrometre in size.

The initiative's generous funding boosted

industrial development and innovation in globally competitive areas such as microelectronics and biotechnology. For fear of being left behind, funding agencies worldwide, including in Europe and Japan, quickly adopted similarly broad definitions. More recently, nanotechnology has ventured even further. It is now portrayed as a key and novel way of tackling the world energy crisis and water shortage. Yet top-down production is intrinsically wasteful of materials and energy.

The drive to miniaturize has been with us a long time. Joachim and Plévert chart the progression from ancient Greek astrological clocks to James Watt's steam engine to the discovery of the electron and finally today's microelectronics. The authors explain clearly that, when