

would practitioners in health care, for the numerous potential applications explored.

I would challenge Martin's assumptions that superiority humour theory be understood in the context of psychoanalytical theories of psychology. This framework has more to do with social groups, social status, and social roles, and humour directed at individuals in positions of power, than the targeting of already vulnerable groups. Further, separating superiority theory from coping or arousal forms of humour is advised. Kant's theoretical interpretations apply more to incongruity humour than to relief, and I would credit Henri Bergson with ascending (from the ridiculous to the sublime) and descending (from the sublime to the ridiculous) forms of humour, rather than Max Eastman.

Chapter 11 on psychotherapy describes therapists using humour with clients (humour in therapy) but ignores therapists recommending humour as therapy (especially misses an opportunity to report on evidence from play therapy). Martin asserts that humour serves a number of important social functions in interpersonal communication, and then contradicts those remarks by insisting that there is no solid evidence for applications in psychotherapy, education, and the workplace. His repetitive commentary that there is no clear evidence of humour's contribution to improved health, or even any health benefits is overly critical and disappointing.

For many years the presumption in abnormal psychology has been that individuals would seek psychological help when abjectly miserable. Now with the advent of positive psychology, individuals are presumed to be assisted by character traits that provide a foundation of resilience. A book on the psychology of humour has the potential to achieve both, with humour as therapeutic in the face of adversity, and with humour traits or propensities providing capacities to endure severe psychological distress.

Martin's concern, that humour has *not* been regarded as sufficiently serious as to warrant a focus in psychology; or is considered too esoteric as to be subjected to systematic manipulation and investigation required of good science, continues to resonate in the scholarly community. The problem persists as researchers have failed to recognise the essentially emotional nature of humour, opting instead for a cognitive-perceptual perspective, much like psychology as a discipline.

Consistent with Martin's own assertion that research on humour must represent an enjoyable job, this book is a highly readable and extensive reporting on the nature and application of humour to enhancing and improving the quality of our lives. The basic premise that humour and laughter remain largely ignored in psychology continues to be problematic. Being able to enjoy and express humour through amusement and laughter seems to be an essential part of being human, with the capacity for repairing a fragile and overly burdened psyche. A psychology of humour (especially an integrated approach) and psychologists (especially Canadian) are helpful in recommending human cognition, emotion, and social behavioural improvements useful in alleviating human misery. Martin's book dispels all concerns by providing an integrative and interactive approach, including an elaborate and fascinating compendium of scientific investigations.

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health, and he has published more than 40 journal articles and book chapters in this area. He is currently president of the International Society for Humour Studies and is on the editorial board of the society's journal. His research has been featured in numerous national and international newspaper and magazine articles and radio and TV programmes.

Ann Marie Guilmette completed a PhD in social psychology from the University of Windsor with a dissertation topic focussed on interactive incongruity humour. She is an Associate Professor in the Department of Recreation and Leisure Studies, in the Faculty of Applied Health Sciences at Brock University, and teaches classes on play and culture as well as therapeutic benefits of humour. She published an article titled "Joking" for the *Encyclopaedia of Leisure and Recreation in America*, and is a past-president of the International Society for Humour Studies (ISHS), and the Association for the Study of Play (TASP).

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*Biological Influences on Criminal Behavior*, by Gail S. Anderson.  
CRC Press, 2007, 336 pages (ISBN: 978-1-420-04331-0, US \$94.95 Hardcover)

Reviewed by SANDEEP MISHRA and MARTIN L. LALUMIÈRE

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Nikolaas Tinbergen, a Nobel Prize winning ethologist, proposed four levels of explanations for the study of behaviour (Tinbergen, 1963). *Ultimate* explanations for behaviour involve asking questions about function (or adaptation). For example, how have aggressive tendencies evolved to solve particular problems in some circumstances? *Phylogenetic* explanations involve comparing the behaviour in related phyla. For example, what are the similarities in aggression in humans and other apes? *Proximate* explanations involve asking questions about two other levels, *causation* and *development* (or ontogeny)—that is, understanding the direct mechanisms through which a behaviour comes to exist (e.g., how does diurnal variation in testosterone affect aggression?) and the developmental course of a particular behaviour (e.g., how do aggressive tendencies change with age?). These four levels are proposed to be complementary; together they provide a complete explanation for behaviour.

We mention Tinbergen's four levels of explanations because of their importance to biological disciplines that use behaviour as a unit of analysis, including behavioural ecology, ethology, biology, and psychology. Although Tinbergen's explanations have long informed the study of the behaviour of other animals, two of the four explanations (function and phylogeny) have been largely

neglected in the study of humans until relatively recently (e.g., Daly & Wilson, 1988).

Gail Anderson, primarily known for her pioneering work in the field of forensic entomology, authored a book that joins a small but growing literature that addresses important biological questions about criminal behaviour. Although Anderson does not explicitly use Tinbergen's explanatory framework for her book, she does a remarkable job of summarising research on criminal behaviour that addresses three of these fundamental levels of explanation. Much of the book focuses on discrete proximal causes (e.g., hormones, brain chemistry, diet), as well as development and factors affecting development (e.g., genes, birth complications). Some ultimate (functional) explanations are covered in one chapter, and phylogeny is absent (for an accessible discussion of the phylogeny of male violence see Wrangham & Peterson, 1996). In the following, we briefly summarise the content of the book and offer some constructive criticisms.

The book begins with an introduction to the use of biology to explain crime, disposing of many historical and contemporary criticisms of such an approach (e.g., genetic determinism, justification of eugenics). An interactionist approach to biological explanations of crime is emphasised, making it clear that both environment and genes play an important role in all behaviour, including crime. This perspective is strongly maintained throughout the rest of the book. Anderson also rightly notes that "most behaviour is genetically predetermined to be affected by the environment" (p. 66). A background on important biological concepts, including evolution by natural selection, the nature-versus-nurture debate, genes, and inheritance is also provided in the first two chapters. Although Anderson's stated goal of the book is to address primarily proximal (what she calls "organic") biological influences on crime, the inclusion of a chapter on evolution by natural selection and its influence on criminal behaviour is welcome and useful. The third chapter clearly explains basic genetics, inheritance, and the link between genetics and evolution by natural selection.

Genetic predispositions for behaviour, and criminal behaviour more specifically, are addressed in chapters 4 and 5. Chapter 4 discusses important misconceptions about the field of genetics (e.g., cloning) and addresses the fundamentals of behavioural genetic designs (e.g., twin studies). Chapter 5 provides an excellent overview of twin and adoption studies investigating crime, antisocial behaviour, conduct disorder, attention-deficit hyperactivity disorder, general aggression, and traits related to psychopathy.

Chapter 6 addresses hormonal influences on behaviour, with an emphasis on the influences of testosterone on crime. The literature is unclear as to how testosterone affects aggression or crime in general, and the book summarises the research well. Other hormones and their influence on criminogenic behaviour are discussed, such as growth hormone, cortisol, thyroid hormones, and adrenaline.

Chapter 7, on pregnancy and birth complications, does an excellent job of addressing an important developmental window that can influence criminal behaviour. The book discusses several issues associated with abnormal in utero development and birth, including foetal development and diet, birth complications, and minor physical anomalies. The role of maternal substance use on criminality is also addressed, including important discussions of

foetal alcohol syndrome and maternal smoking. Brain chemistry and organic brain dysfunctions are addressed in the next three chapters. Neurotransmitters (chapter 8), brain injury (chapter 9), and other brain dysfunction elucidated by imaging studies (chapter 10) are well discussed in the context of criminal behaviour. In chapter 10, Anderson also briefly discusses imaging studies relevant to psychopathy.

The final chapter addresses the influence of diet, toxins, and food additives on criminal behaviour. This chapter is very interesting, especially because this topic is rarely discussed. Although this research area is in its infancy, the book summarises important work linking blood sugar levels, amino acids, vitamins, fatty acids, and general diet to behaviours associated with criminality. Other environmental influences, including exposure to heavy metals such as manganese and lead, are discussed with respect to their influence on intelligence and attention-deficits, amongst other things.

Overall, Anderson's book provides an excellent overview of biological influences on criminal behaviour and behaviours or traits associated with crime such as aggression, impulsivity, conduct disorder, attention-deficit, and hyperactivity. She also includes some oft-ignored, but important content, such as coverage of evolution by natural selection. Finally, Anderson effectively emphasises the importance (if not the necessity) of considering biology in explaining criminal behaviour, without making it seem like such a perspective excludes social factors (in Tinbergen's framework, social factors are proximal factors). In fact, she repeatedly suggests that biological research has the greatest potential to lead to prevention and treatment advances.

The book is not without its faults, however. At times, the text is quite simplistic, particularly for a target audience of senior undergraduate university students. One would think that the false nature-nurture dichotomy, for example, would be addressed and dispensed with by at least the early undergraduate years of university, but perhaps we are too optimistic. Because the study of the biology of behaviour is so often misunderstood, Anderson probably made the right choice to "start from scratch."

A few important concepts were not covered in this book. For instance, the difficult concept of heritability is not defined or explained, even though Anderson reports heritability estimates in chapter 5. Heritability is a concept that is often misunderstood, even by seasoned faculty in psychology (ask your colleagues what is the heritability of the number of fingers on one's hand, and most will mistakenly answer "very high, close to 100%," when the correct answer is close to zero). The emerging and productive field of molecular genetics could have received more attention. The notion of psychopathy did not receive the discussion it deserves: Psychopathy represents something distinct from general criminal tendencies, something that probably deserves its own explanation (e.g., Lalumière, Harris, Quinsey, & Rice, 2005; Lalumière, Mishra, & Harris, 2008). Finally, the interesting chapter on ultimate explanations was forgotten during the discussion of proximate factors. Certainly, many environmental conditions mentioned in chapters 6 to 11 have been recurrently present throughout the evolutionary history of *Homo sapiens*, and would have created significant selection pressures. Is it not reasonable to expect that the brain has evolved to adaptively respond to these environmental inputs? It has not escaped the notice of some that criminal behaviour often involves the acquisition of tangible and intangible "things" (material resources, status, reputations, sexual access) that

would have had a significant effect on reproduction in ancestral environments (e.g., Daly & Wilson, 2001).

We recommend this book as a comprehensive and critical introduction to the biology of criminal behaviour. Biology has long been neglected in the investigation of criminal behaviour, and little work has been done to address all of Tinbergen's fundamental levels of explanations with regard to criminal behaviour. Anderson's book represents another step in furthering the scientific and lay understanding of this important social problem.

Gail S. Anderson has a PhD in medical and veterinary entomology and is a Professor of Forensic Entomology in the School of Criminology at Simon Fraser University. Her research interests are in forensic entomology and the application of forensic science in law, which includes terrestrial and marine decomposition and colonisation, impact of arson on forensic evidence, insect development, and oviposition. Broader areas of research include patterns of homicide, poaching, and the wild-life trade. She serves as a forensics consultant to the Royal Canadian Mounted Police and city police across Canada. Amongst her many accolades, she was listed in *TIME* magazine as one of top five innovators worldwide in criminal justice and recently received the Derome Award from the Canadian Society of Forensic Sciences.

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*Handbook of Emotion Regulation*, by James J. Gross (Editor).  
 Guilford Press, 2006, 654 pages (ISBN: 978–1–59385–148–4,  
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Reviewed by LOUIS A. SCHMIDT

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The purpose of this edited volume is to bring the reader and the scientific community up-to-date on the burgeoning field of emotion and particularly how it is regulated. The origins and maintenance of two of the most pervasive psychiatric disorders today, mood and anxiety, both involve problems with the regulation of the emotion of fear. It is the emotion of fear that is conserved across mammals in its behavioural expression, elicitation, systemic physiology, and neural circuitry. Although emotion was long viewed in a pejorative sense in the scientific community, there has been a significant change over the last two decades in how we view and understand emotion. Recent theoretical and methodological advances in the field of neuroscience have informed how we view and reason about emotion. There are now theoretical models that allow us to derive testable hypotheses, and new technologies in place to test these hypotheses and reproduce findings. Gross very nicely captures the range of topics and issues surrounding the topic of emotion and emotion regulation in this edited volume.

The book comprises 30 chapters divided amongst seven traditional sections within psychology: foundations, biological bases, cognitive foundations, developmental approaches, personality process and individual differences, social approaches, and clinical outcomes. Notwithstanding the first section on foundations, each section contains approximately five chapters written by leading experts in the area. Each chapter is very readable and thorough. Unlike many handbooks that face the danger of being somewhat disjointed and out of use even before their publication date, given that experts often write chapters that are too narrowly focussed, this handbook is an exception to that rule. Gross has done an excellent job of integrating and synthesising the various chapters, giving meaning across the entire book and encouraging the contributors to write chapters that will not go stale within a year or two of publication. Attention to this detail is particularly important given the enormous and rapid growth in the field of emotion.

Each of the major sections provides very good coverage of the historical and contemporary extant literature. Of the seven sections, three come to mind in which the coverage could have been enhanced. Although the section on the biological bases of emotion and emotion regulation provides an exhaustive and very timely coverage of recent work on humans, there is relatively scant work reviewed on nonhumans. There is one excellent chapter by Davidson and his colleagues (chapter 3) that provides coverage of nonhuman primates, but this chapter is the only one. Overall, this entire section could have been improved with a chapter specifically dedicated to a review of nonhuman animal work and models of other mammals. In fact, I was a bit surprised by its absence given that so much of the growth in the field has been the result of nonhuman animal work.

The section on developmental approaches is another area in which an additional chapter or two covering some of the de-