

Book Review

Depth from Breadth

Book Review: *Body Heat: Temperature and Life on Earth*. Mark S. Blumberg, Harvard University Press, Cambridge, Massachusetts, 240 pp. \$22.00

You've seen the movie (Kasdan, 1981). Now read the book (Blumberg, 2002). It's *Body Heat*, by Professor Mark S. Blumberg. The book's seemingly immodest subtitle, *Temperature and Life on Earth* is, in fact, apt. This illuminating volume covers the map. It is, in part, a treatise on temperature as a physical force that enables and shapes life. It also is an exposition and exploration of the results of this force, as seen in the behaving bodies—human and nonhuman—all over the world.

The grand themes that represent much of organismal life on Earth—eating, sleeping, sex—serve as anchors for explorations of the heat within us. Blumberg instructs and illustrates with research stories that feature flowers, worms, termites, reptiles, penguins, polar bears, humans, and rats, of course. Consider a sample of topics: temperature-dependent sex determination, thermal aspects of breathing in infants and their implications for Sudden Infant Death Syndrome, how studies of “behavioral fever” in lizards led the way to understanding the physiological cascade by which interleukin and prostaglandin decrease the availability of the nutrient iron to pyrogenic bacteria that produce human fever, the nonthermal “heat” of piquant foods, and the production of thermal illusions that attract insects, just to cite a few of the enticing tales of natural history and laboratory investigation that comprise this volume.

This is not a textbook nor is it empirical monograph. There are no graphs and only a handful of photographs and illustrations. Rather, the chapters are thematic essays, built around broad and basic topics: body-temperature homeostasis, sleep and rhythms, metabolism, sensation

and perception. Sometimes these themes are constructed by a series of research stories, each contributing a substantive point or two, while in other cases the theme emerges from a historical narrative or a familiar, real-life example. Blumberg treats us to some fine, stylized essays. Significantly, the first chapter (“Temperature: A user's guide”) provides useful surveys of elementary thermodynamics and methods for measuring heat; we meet Daniel Fahrenheit, Anders Celsius, and William Thomson (who later became Lord Kelvin). Physics and physiology are then blended in a smoothly written overview of heat transfer: conduction, convection, radiation, evaporation, and the Surface Law. We're ready for organismal and behavioral biology! And off we go, exploring topics so diverse that it would be utterly mind boggling if not for the unifying theme of temperature.

Is this handsomely produced volume especially relevant to the readership of *Developmental Psychobiology*? For several reasons, I think that it is. The author is “one of our own:” Mark Blumberg has been raised within the ranks of our international society. He is a regular contributor to the annual meetings and to this journal. His own research is seminal and appropriately represented in the book (supporting discussions of behavioral thermoregulation, rat vocalizations and copulatory patterns, the molecule leptin, brown fat metabolism, and sleep). Thus, I think that readers of this journal will find much material that is directly applicable to developmental psychobiology. Indeed, we readers of *Developmental Psychobiology* should enjoy a privileged perspective; we are well positioned to appreciate many of the book's concepts and examples. There is a simple, but sophisticated discussion of ontogenetic adaptation, thought-provoking consideration of genetic explanations of organismal phenomena, and overviews of reproductive strategies involving precocity and altriciality. In short, this volume offers much that applies directly to the field of developmental psychobiology.

The extraordinary range of topics could create a confusing barrage, but this is avoided because the book is well crafted. We travel on paths of observations and ideas, often initiated by a mundane example or a childhood reminiscence that evolves into a thoughtful discussion of a

surprising dataset. We begin to get a “feel” for how life is united by basic principles and common mechanisms—solutions to common problems of maintaining a living body in a dynamic, thermally challenging world. We organisms are locked, by chemical bonds, to an existence within a remarkably narrow temperature range. Too high or too low, and the chemical reactions that define life will break down. But life arose and discovered ways of persevering. The rest is history—evolutionary history—and this book is about the fruits of such evolution of life on Earth.

In this age of acute specialization and reductionism, *Body Heat* is an anomaly. Perhaps the book’s most important message is not stated explicitly but is transmitted implicitly. Mark Blumberg demonstrates that broad scholarship begets deep understanding. He does this by formula. We are shown some basic principles; these are explained directly and simply. Then, by applying these principles to a broad array of observations, we are shown unity among seemingly disparate phenomena. We see that the complexity of life need not be tamed by reducing life to minute units with the hope that they will be simpler and someday add up to the whole show (Neither of which are true.) Blumberg’s breadth and penchant for parsimony is a wonderful reminder of the power of integrative thinking. He applies common principles to phenomena on vastly different scales: the cooling rates of the planet Earth and of rat testicles, or the movements of nematode worms controlled by their amphid receptors and enduring human practices of thermal baths, as evidenced by the Roman remains on Masada and the spas we favor today. We see many examples of unity as he spans the humanities, arts, and sciences as well as connects what we often consider to

be separate levels of analysis. Blumberg’s treatments do not take us “up” or “down” different levels. He deals with both molecular and molar topics, to be sure, but they are not vertically organized. Rather, they are demonstrations of common principles that exist on the various levels of analysis.

After you read the book, see the movie. Lawrence Kasdan wrote and directed a masterful film noir; the twists and turns of the suspenseful drama practically ooze within the omnipresent heat. Glistening skin, soaked shirts, perpetually moving fans, and cold cans of beer pressed against sweaty necks are constant reminders of the relentless heat in the southern settings. You’ll appreciate the physical and physiological significance of the images after reading Mark Blumberg’s book. You also may recognize the artistry by which the various indices of heat are used to create the sultry sense of the film, and you will surely recall Blumberg’s observations on thermal metaphors that pervade our language. Most readers should find *Body Heat* a source of intellectual enjoyment as well as a useful resource for presentations, explications, and esoterica to impress, amuse, and delight.

REFERENCE

Kasdan, L. (Wtr., Dtr.) (1981). *Body heat* (with William Hurt, Kathleen Turner). The Ladd Company.

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