

Book Review

The Tangled Wing: Biological Constraints on the Human Spirit by Melvin Konner, 2nd edition. Henry Holt, New York, 2002.

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In the 1970's, people at Harvard interested in human behavior behaved like members of rival high-school cliques. Under the banner of sociobiology were biologists Bob Trivers, a brash young genius, Ed Wilson, synthesizer and visionary, and master anthropologist Irvan DeVore whose many students, such as Sarah Hrdy, Steve Gaulin, John Tooby and Barbara Smuts, were beginning to carry the revolution forward. They were challenged by the vaunted leaders of neighboring fields such as geneticist Richard Lewontin and paleontologist Stephen Jay Gould, evolutionists who for both scholarly and political reasons were scornful of the new pronouncements about human behavior. Supported by social scientists mistrustful of biology in any form, these skeptics wore their left-wing politics on their sleeves and raked the sociobiologists with accusations of bias and incompetence.

Anthropologist Melvin Konner found himself in this cauldron after returning from two years of living with !Kung San foragers in Botswana. The intellectual in him was quick to appreciate the merits of the newly confident natural selection theory. But he saw its faults as well. The nascent sociobiology was far too simple: it ignored the details of how the body made the mind. Konner, poet and physiologist that he was, wanted to give the emotions a fuller role partly because of their inherent importance for understanding adaptive behavior, and partly because emotions often don't follow simple rules: they can lead people to behave in weirdly constrained or maladaptive ways.

There was another difficulty too. Konner's time with the !Kung San had steeped him in realities that weren't easily reconciled with the world of the selfish gene, at least as it was portrayed a quarter-century ago. In the Kalahari, writes Konner, "only intractable violence is more repugnant to San than selfishness, and the former is so strange it is classified more as mental disorder than sin."

This was the background for the first edition of *The Tangled Wing*, which Konner published in 1982. Perhaps I exaggerate his sense of scholarly dissonance, but certainly *The Tangled Wing* received much praise for its resolution of the

tensions among a starkly clear evolutionary biology, a rich and messy physiology, and a humanistic desire for a nuanced world. Beyond the simple rivalries that politicized the field *The Tangled Wing* established the case for an integrated biology true to natural selection but respectful of the wet details, from gene and hormone to the ethics of sharing, mutual dependence and organic social harmony.

Now twenty years later, Konner has rewritten his magnum opus. His aim is not to advance original ideas or to critique the field. It is, as before, to describe the foundations of human nature using well-established concepts and the most promising of new ideas.

He explicitly adopts the four major perspectives that Niko Tinbergen recommended and which complete biologists now prefer (adaptation, phylogeny, mechanism and ontogeny). Biology moves so fast, and these four perspectives are normally so separate, that the task was ferociously difficult. It required every chapter to be extensively rewritten in the light of a broad series of fast-moving science, and then to have its results distilled into readable stories and even original concepts. But Konner succeeds. Among a plethora of books that survey the ways in which natural selection theory helps us understand ourselves, *The Tangled Wing* provides a unique combination of encyclopedia and art, and in both areas it is exceptional. Of all such works it goes deepest into the body, and widest to the soul.

Any of the seven chapters on emotions – which make up the central third of the book - can illustrate how well *The Tangled Wing* combines big-picture questions with technical expertise. Take *Fear*, which like other chapters has the science framed by pages of anecdote and vision. “We have dropped into the bowels of the beast,” begins Konner, “where the snarl curls, poised to provocation.” He opens with the blood-curdling terror of a Vietnam veteran’s war memories, then asks what a caribou feels when feeding calmly on a wolf-dotted tundra. “A clench of fear that persists but is transcended? A transient fear when the wolf appears on the horizon, which subsides and is followed by calm? A continuous mild fear below the surface of the action, quickly intensified by certain of the wolf’s movements?” The questions, elegantly precise, are never answered but they lead us to the web of ethology, endocrinology and neurology that occupies the heart of the chapter. Konner deals with each freshly.

Take the escape response, half a billion years old, which as “a delicately timed firing sequence of billions of nerve and muscle cells” is known to ethologists as a Fixed Action Pattern. But “the word *fixed*,” writes Konner, “makes them seem more rigid than they are. The original German word for these behaviors was *erbkoordination* – “legacy coordination”,” a term that Konner recommends because it speaks of “preplanned leeway” rather than fixed or rigid behavior. Konner knows enough ethology to have helpful ways of discussing old questions such as the relationship between nature and nurture.

But it’s physiology that engages him most. We start gently, learning that strong

stimuli to the amygdala induce the expressions of fear in cats, then slide rapidly around the limbic system before becoming enmeshed in confusing controversies among the leading neural theorists. Konner deals adroitly with the technical complexities by summarizing them in science-speak before returning us to a more comfortable level. “So how might a zebra that has once been chased and almost eaten by a lion become afraid of the setting in which the lion’s cough was heard? It needs its hippocampus to match up the sound with the smells at a certain water hole and the light emblematic of dusk. ... Thus the hippocampus lets the amygdala know there is reason to fear, even in the absence of a single, glaring, unambiguous sign.”

Cortisol, adrenaline, dopamine and testosterone play their roles in fear, partly clarified by knock-out (and knock-in) gene studies in the 1990’s. Hebb’s discrepancy theory explains much in the development of fear, though not all the complexities in Kagan’s shy-bold dimension of children’s temperaments, nor in rhesus monkeys socially “immunizing” each other against fear, nor in the cross-cultural differences in Ainsworth’s Strange Situation. Konner ruffles through a deck of such cards, a magician of the lab and field. Towards the end of the chapter he uses adaptation to pull a hand together, starting with Nesse’s ideas for why we show continual, general fear: natural selection had to make us afraid, and we are left with phobias more debilitating than we need. There’s clinical significance here, says Konner, as he takes us into a critique of Freud’s *The Problem of Anxiety*. He finds sufficient merit in Freud to integrate his best bits with current behavioral biology, such as the GABA and serotonin system, and the respective effects of Valium and Prozac. And just as our heads are spinning with too much science, he eases us back to reality with a beautiful description by his late wife, Marjorie Shostak, of the palpable fear that was felt by a group of !Kung on a particular night that a lion was close. “Now, hours later, the talk went on – unusual for that time of night. Fear moved from group to group like wind in the treetops. ... Surely, I told myself, they had a plan.” The scene from the Kalahari ties the science together, because, says Konner, “we are – not metaphorically but precisely, biologically – like the doe nibbling moist grass in the predawn misty light; chewing, nuzzling a dewy fawn, breathing the foggy air, feeling at peace, and suddenly, for no reason, looking about wildly.”

Fear could be easily expanded to a short book. Like every chapter in *The Tangled Wing*, it is dauntingly rich, elegantly composed, and startlingly novel in the completeness of its synthesis. This bravura performance comes with conclusions that can be challenged, such as Konner’s conviction that xenophobia comes from irrational fear, or that “violence is what we do from our fathomless anger against death.” It also has occasional slips, often trivial but nevertheless unnerving. So it is reassuring that the facts can be checked. There are 200 pages of printable references to be found on an accompanying web-site, so that *The Tangled Wing* can be confidently used by professionals as an entry to a more

specialized literature. The first third of the book (“Foundations of a Science of Human Nature”) has eight chapters on topics from Human Evolution (“The Crucible”) and Adaptation to Sex and Language, and these are as sound as those on emotions. Like the natural history of a well-described habitat, Konner’s science gives each chunk of knowledge its niche.

The Tangled Wing certainly succeeds as reference, but it’s not where Konner is aiming. He wrote for generalists who cherish science and art in concert, and who want to know why biology matters. So his final chapters tackle moral philosophy and spiritual questions about who we are. Occasionally his concrete analysis gives way to optimistic vagueness, such as when he says: “We must once again experience the human soul as soul, and not just as a buzz of bioelectricity;” or “we must restore wonder;” or “we must choose, and choose soon, either for or against the further evolution of the human spirit.” But Konner’s desire to reconcile science and feeling is mostly specific and rooted, as when he discusses the ozone layer or water shortage. If his impatience sometimes emerges, it is easy to be sympathetic. Through more than 400 pages *The Tangled Wing* shows a man of balance juggling a love of literature with knowledge of physiology, and combining the rebel with the conventional scientist. Passion is the central topic of the book, it imbues the writing, and it is only right that Konner should end with it. Konner’s humane appeal for a workable social world that takes biology seriously is popular science at its lyrical best.