AUTUMN BOOKS

NEUROSCIENCE

The mother lode of invention

Dan Jones compares three studies on the origins and fruits of human creativity.

Locating the wellsprings of creativity is a challenge on a par with teasing apart the origins of consciousness. Ecologist E. O. Wilson, however, has a simple starting point. In *The Origins of Creativity*, his 30th book, he declares that we as a species are defined by creativity — an “innate quest for originality” driven by an “instinctive love of novelty”. The idea is echoed in *The Runaway Species*, by composer Anthony Brandt and neuroscientist David Eagleman, a lively exploration of the software our brains run in search of the mother lode of invention. Meanwhile, physicist Mario Livio examines the inquisitive nature of geniuses in *Why?*.

Wilson’s bald assertion raises obvious questions. Why do humans alone have such creative potential? What happens in the brain and mind during the creative process? Why are some people so astonishingly creative?

The Origins of Creativity

EDWARD O WILSON

Liveright: 2017.

The Runaway Species: How Human Creativity Remakes the World

DAVID EAGLEMAN AND ANTHONY BRANDT

Catapult: 2017.

Why?: What Makes Us Curious

MARIO LIVIO

Simon & Schuster: 2017.

However, a detailed exploration of evolutionary origins, cognitive neuroscience and the psychology of creativity is not forthcoming. This book, packed with anecdotes and personal reminiscences, is more a meditation on how our genetic and cultural nature shapes our experience of the world, and how that in turn influences the form and content of our creative output. Wilson considers the

relationship between science and the humanities, and calls for a “third enlightenment” that fuses the empirical strengths of the former with the imaginative ways of capturing human experience nurtured by the latter.

He argues that the humanities, predicated as they are on exploring the human condition, need to ally with what he calls the Big Five disciplines: anthropology, evolutionary biology, neurobiology, palaeontology and psychology. The creative impulse, writes Wilson, did not spring into life 10,000 years ago as some suggest, but dates back more than 100,000 years, to the birth of modern humans. A tripling of brain size over the 3 million years before that had endowed *Homo sapiens* with increased social intelligence and empathy, paving the way for symbolic language. Indeed, Wilson traces the origins of the humanities to “the nocturnal

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firelight of the earliest human encampments”, around which people gathered to gossip, establish status and form alliances. His view is that until a better picture can be drawn of prehistory, the humanities — which lack a full causal explanation of the human condition — will continue to exist in an anthropomorphic “bubble of sensory experience”.

Wilson seeks to redress that balance by exploring how findings in the Big Five can enrich our understanding of culture. Clearly a cinephile, he uses films to illustrate how literary and dramatic narratives cluster into archetypes shaped by our evolutionary history and the suite of emotions it has bequeathed to us. So our love of the hero, a protagonist who has to overcome great challenges or outwit powerful enemies, is the “instinctive product of endless prehuman and primitive warfare”. Likewise, our penchant for ‘pair bond’ archetypes — think Ridley Scott’s 1991 *Thelma & Louise* or Akira Kurosawa’s *Stray Dog* (1949) — springs from our instinctive appreciation of “altruism and cooperation”. And Wilson argues that our evolutionary past shapes many cultures’ aesthetic preferences. Gardeners “from the temples of Kyoto to the baronial estates of England”, he writes, choose trees that share

features with the acacias of the African savannahs (short trunks, broad canopies and small, divided leaves), which offered protection from predators and were useful observation towers.

Wilson touches on gene–culture co-evolution, and defends his controversial embrace of group selection (M. A. Nowak *et al. Nature* **466**, 1057–1062; 2010). He believes that the equations of inclusive fitness theory are flawed, and that there’s no evidence for kin selection, nor any need to invoke it to explain social behaviour. It’s a stimulating ride, but it fails to pin down the origins of creativity.

The title of Brandt and Eagleman’s book perhaps reflects some of that elusiveness. *The Runaway Species* is beautifully produced, illustrated and written. It sweeps the reader through examples from engineering, science, product design, music and the visual arts to trace the roots of creative thinking to three key mental skills: bending, breaking and blending.

Bending describes the representation of some element in unusual ways. Architect Frank Gehry warps the lines and planes of a building into waves and curves; Albert Einstein bent how we look at the fabric of the Universe with his theories of relativity. Breaking involves fragmentation and reassembly. We see it in Pablo Picasso’s 1937 painting *Guernica* and Johann Sebastian Bach’s *The Well-Tempered Clavier* (1722–42), in which part of an established theme is cut out and repeated with variations. Blending combines sources, exemplified by the genre-mashing sampling of beats and melodies in hip hop.

Creative people constantly find new ways to bend, blend and break the world’s cultural archive. They also “proliferate options” by making variants of a given work: Ernest Hemingway drafted 47 versions of the ending to his 1929 novel *A Farewell To Arms*; Picasso painted 58 works inspired by Diego Velázquez’s *Las Meninas* (1656). Creative people are also bold: innovation, as any entrepreneur knows, is a risky business.

Brandt and Eagleman also explore how creativity might be nurtured from boardroom to classroom, in “the sweet spot between unstructured play and imitating models”. Like Wilson, they conclude that creativity springs from a restless brain bored by monotonous input. Compared with other species, they write, humans have “more brain cells between sensation (what’s out there?) and action (this is what I’m going to do)”, which allow us to

contemplate situations and possibilities, and “move from the reflexive to the inventive”. The book contains little cognitive neuroscience to show how any of this happens, and no serious evolutionary account of why the brain is like this. Thus *The Runaway Species*, too, fails to pinpoint the source of creativity, or why humans are singularly endowed with it.

The yen for the new that both books see as key may explain why companies keep churning out smartphones, but does it get to the bottom of the creative drive? At least as important is curiosity, avers Mario Livio in *Why?*, an energetic look at the psychology and neuroscience of our inquisitiveness.

Geniuses are often relentlessly curious about almost everything, contends Livio. He traces this through the lives and works of Renaissance polymath Leonardo Da Vinci and physicist Richard Feynman, as well as interviews with modern scientists and crossover figures, from Freeman Dyson to guitarist-cum-astrophysicist Brian May, of the band Queen. Livio finds that although curiosity can be piqued by novelty, it’s also sparked by encounters with complex phenomena (how does this work?), uncertainty (which choices will lead to desired outcomes?), and conflict (how does this fit in with what I already know?).

Sometimes, curiosity pulls us towards big, abstract questions about the workings of nature — Isaac Newton on gravitation, or Charles Darwin on evolution. Or it leads to solutions for practical problems, such as the methods for protein and DNA sequencing invented by two-time

Nobel prizewinner Frederick Sanger. Often, the same person will shift between these levels: Einstein also worked on designs for refrigerators, cameras and microphones, as well as patenting a blouse (as *The Runaway Species* taught me).

Read together, these three books remind that, despite the astounding scope and richness of human creativity, we still lack a broad scientific framework for thinking about its cognitive and evolutionary wellsprings. And although the development of artificial intelligence gathers pace, it’s still too early to say whether it will offer us world-changing ideas. What’s sure is that, in an era of climate change, intractable inequity and geopolitical instability, creative solutions are an imperative. ■

Dan Jones is a freelance writer in Brighton, UK.
e-mail: multipledraftsltd@gmail.com

CREATIVE PEOPLE BEND, BLEND AND BREAK THE WORLD’S CULTURAL ARCHIVE.