

Is imagination more important than knowledge?

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Berlin, 1929. The poet and journalist George Sylvester Viereck has charmed an interview out of an initially reluctant superstar physicist¹. He asks: "How do you account for your discoveries? Through intuition or inspiration?" Albert Einstein replies:

"Both. I sometimes *feel* I am right, but do not *know* it. When two expeditions of scientists went to test my theory I was convinced they would confirm my theory. I wasn't surprised when the results confirmed my intuition, but I would have been surprised had I been wrong. I'm enough of an artist to draw freely on my imagination, which I think is more important than knowledge. Knowledge is limited. Imagination encircles the world."

Knowledge versus imagination. Einstein's soundbite reflects, as soundbites often do, a deep-seated pattern in human thought. The ancient dichotomy between what we know and what we dream, intuit or sense by instinct is found, in some form, in every field of human intellectual endeavour, from rationalist versus mystic interpretations of the world's great religions and theologies through the many traditions of realism and surrealism in the visual arts to the comparison between the brutal number-crunching of much experimental physics and the feathery abstractions of superstring and membrane theory.

Einstein favoured imagination: colourful, creative, antiauthoritarian. Artists, geniuses and other rebellious spirits have often claimed it as their territory. Knowledge, that dull conviction resulting from a brush with reality, is black-and-white, logical, stable, conservative – the domain of ordinary scientists, museums and accountants. In other words, your view of which is more important will depend on your personality. The relevant distinction was best captured not by a psychology text but by a history book (of sorts): in their discussion of the English Civil War, Sellars and Yeatman famously describe the Cavaliers as "wrong but wromantic" and the Roundheads as "right and repulsive". Who'd be a Roundhead? Who won the Civil War?

Like many dichotomies, this one is an oversimplification. We know that the brilliance of great artists was grounded in years of hard training; we know of creative scientists, excitingly imaginative museums, even creative accountants. Throughout our development as a species we have relied on a blend of imagination and knowledge. Both are valuable. What then is the relationship between them?

¹ The interview was published in the Philadelphia *Saturday Evening Post*, October 26th, 1929.

Metaphors are plentiful. Knowledge is a stepping stone to imagination; it stands to imagination as honeycomb does to honey; knowledge and imagination are enemies, or independent strands in the web of our mental lives. The Oxford English Dictionary, that colossus of knowledge, states that imagination involves "forming a mental concept of what is not actually present to the senses". But the full flavour of Einstein's soundbite eludes this definition. I can form a mental concept of what I ate at last week's dinner party, though it is no longer present to any of my senses (even those obscure but useful ones which signal the state of my bowels). Imagination is something more than memory, something novel: adding a movie star to the guest list, removing clothing from the guests (or, for the adventurous, both).

Einstein's words place imagination and knowledge in opposition, implying that knowledge should concern what is present to the senses. But knowledge is also a stored and shared repository of publicly acceptable thoughts, many frozen into physical symbols (written or spoken), transmitted through time and space. Knowledge coded, stored and expressed using symbols can, because of the entrancing flexibility of symbol systems, be broken up and reassembled in a myriad novel combinations. It is this act of recombination which underlies the power to imagine. As thinkers from Hume to Chomsky have concluded, our imagination is and must be grounded in our knowledge. The more memories we accumulate, the more material we have to work with, the richer and stranger are the fruits of our imagination.

Imagination, however, is not just the recombination of stored experiences. Such recombination happens every night even in organisms blessed with much less cortex than human beings. What distinguishes us is our capacity for controlled and wakeful dreaming. This is a useful survival aid, helping us to solve problems, anticipate challenges and conceive alternatives. But we have turned imagination into much more -- a good in itself. Like money, sex or drugs, we use it to satisfy our needs, flaunt our wealth and status, tighten our social bonds, or distract us from realities we'd rather avoid.

The comparison with drugs implies the risk of addiction, and indeed, our urge to imagine, and to consume the products of other people's imagination, can sometimes become extreme. Reality, coated as it is with the Darwinian chill of being nothing special, can be a bleak place, especially for those who lack the essential antidote: love. When depression sets in, an individual may lose the strength to use imagination to counteract the automatic, overwhelmingly negative thoughts characteristic of the condition. The products of others' imaginations provide an alternative.

A best-selling page-turner or high-octane movie draws us into another world. These fakeworlds, from the fantasy of Harry Potter to the horror of Hannibal Lecter, have two ingredients in common which makes them attractive to millions. Firstly, they provide an opportunity for "losing" oneself in an absorption where consciousness of self-as-independent-entity disappears: a sweet, safe, temporary death. Secondly, fakeworlds deny Darwin, confirming Eliot's aphorism that "humankind cannot bear very much reality". In a fakeworld the hero or heroine is special and recognised as such by others. An uncaring universe cannot destroy them, indeed, they are the universe's centre. Voldemort focuses on attacking Harry Potter, Lecter on tantalising yet protecting his adversary Clarice Starling. Identifying with a person who interests such potent beings does no harm to the self-esteem. In some individuals such

cognitive massage can become an obsession in a world where the public ideal is super-confidence.

Here again we see the complementarity of imagination and knowledge. At both group and individual levels, knowledge facilitates community and continuity, while imagination facilitates change. For those who feel they have no community, knowledge may be devalued relative to imagination. Knowledge binds us to a sometimes oppressive existence; imagination helps us escape it. However, imagination evolved as a tool for facilitating survival. Imagining, we take a step beyond what we know into the future or into another world. We see alternatives and possibilities; we work out what we need to reach our goals. Unhooked from reality, imagination no longer serves these life-enhancing purposes. Without new knowledge to feed it and keep it in check, it can become sterile and even dangerous: in Hume's words, "naught but sophistry and illusion". Schizophrenia, paranoid or grandiose delusions, and the rarer but equally frightening conditions of erotomania² or Capgras syndrome³ are among many examples of what can happen when imagination goes out of control.

Another way of thinking about the balance between knowledge and imagination (the "K/I ratio") is to consider them as private or public, individual or group. Wittgenstein famously argued that language is essentially public, requiring consensus about the use of its symbols in order to maintain consistency in meaning over time. One might say the same about knowledge: it must derive from experience in a way which can in principle be reproduced by others. Imagination is a private thing, the leap of a single brain from established fact to exciting novelty.

Again the dichotomy is too simplistic. Knowledge strengthens group bonding, but the emergence of new knowledge in, for example, the sciences can threaten a group's very existence. Imagination can challenge rules and traditions by putting information together in novel ways; yet shared acts of imagination can also help to strengthen intra-group bonds. Try day-dreaming: generate for yourself a coherent story of your own invention, follow it through from beginning to end. Unless you are a professional storyteller you will probably find it extremely difficult to avoid drifting off into other thoughts, falling asleep or, if you're very unlucky, sliding into psychosis. We think of ourselves as the only species capable of controlled dreaming, but in fact it is hard to keep control unless we make our dreams public. The greatest acts of imagination – from Bach's Cello Suites or Milan Cathedral to *Star Wars* or Gunther van Hagen's *Bodyworlds* – require not only creation but admiration; they depend for their impact on being heard, seen and understood within a cultural context built up over hundreds of years by thousands of people.

Was Einstein right? Is imagination more important than knowledge? As our realities become more complex we seem increasingly to prefer imagination, but that

² In erotomania, also called de Clerambault's syndrome, an individual erroneously believes that his or her love for another person is fully requited. This often leads to extremely obsessional behaviour including harassment, stalking and even murder.

³ In Capgras syndrome, believed to result from disconnections between brain networks processing emotion and those involved in face recognition, sufferers become distressingly convinced that carers, family and/or friends have been replaced by robots or impostors.

preference is culture-dependent. Imagination flourishes when its products are highly valued. Leisure, wealth and a degree of political stability are prerequisites for the freedom essential to creativity and for the use of artistic products as indicators of social status. Producers of fantasies also operate within political constraints. Imagination can be highly political, as Orwell, Koestler and Solzhenitsyn demonstrated; too overt an attack on the *status quo* can bring retribution from the authorities, in totalitarian regimes especially. Industries of knowledge may be controlled for the same reason.

When a society feels under threat, shared knowledge, exalted as "culture" or "tradition", may be valued more, raising the K/I ratio. Resources previously dedicated to artistic creativity may be diverted into attempts to protect the society or to acquire knowledge about the changes it is experiencing, leading to reduced artistic output. Art in Renaissance Florence provides an example. Between the Milanese siege of 1401-2 and the French invasion in 1494 a period of relative political stability was the context for some of the greatest paintings and sculptures of the Renaissance. In the chaos of the early 16th century, as power fluctuated between Medici and republican governments, comparatively little great art was produced. Political theory, however, blossomed with the publication of Machiavelli's *The Prince* and *Discourses*.

In other words, unsurprisingly, the K/I ratio is culture-dependent. In medieval Europe, contributing towards a cathedral allowed the rich to display their status to the world. These days, they may collect artworks or buy gratuitous numbers of fast cars. Even within a single society, the preferred K/I ratio in any given domain will depend on the domain in question and on the person making the assessment. Einstein's career, and to some extent his entire self-definition, depended on his rejecting the old establishment of 19th-century physics and creating a new paradigm. No wonder he preferred imagination.

This brings us to another aspect of the complementarity between knowledge and imagination: the K/I ratio changes over time. A new branch of the sciences, for example, may begin with a few mavericks (low K/I ratio) whose research gradually wins acceptance, attracting new recruits at an increasing rate until, in Thomas Kuhn's classic phrase, a paradigm shift occurs and allegiances transfer wholesale from the old establishment to the new. A period of stability follows in which knowledge is assembled (rising K/I ratio) in support of the new ideas. Creative output falls, stagnation gradually sets in. Problems which emerge are ignored by all but a few ... and so the cycle begins again.

As for science, so for religion. Cults often start with an act of radical imagining, what Anthony Wallace calls a "mazeway resynthesis": elements of current cultural understanding (the "mazeway") are recombined into a new and dramatic form which seems to promise solutions to previously insoluble problems. Yet cult doctrines, born in the fiery freedom of imagination, solidify into the restriction of dogma, rejecting any information which does not fit. Members who break away may form new sects; those who remain find their environment increasingly stultifying. Of course, the analogy is not complete: cults can self-destruct in a way that sciences generally do not. But the pattern of growth, stability and attrition seems to be a fundamental one for human groups across many different fields of endeavour.

To conclude, personality, culture and no doubt other factors contribute to the complexity buried in Einstein's soundbite. Is imagination more important than knowledge? It depends on whom you ask, what you ask about, and when.