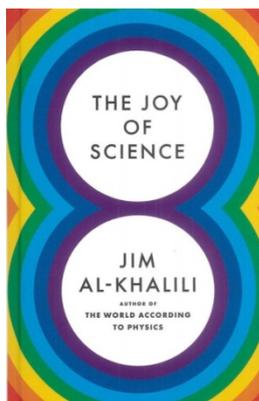


## BOOK REVIEWS



**The Joy of Science.** Jim Al-Khalili. Princeton University Press, 41 William Street, Princeton, New Jersey 08540 and 99 Banbury Road, Oxford OX2 6JX. 2022. xviii + 200 pages. Price: US\$ 16.95. £ 12.99. ISBN 9780691211572.

‘Science is a way of thinking much more than it is a body of knowledge’, wrote Carl Sagan, one of the most illustrious popularizers of science. Simplifying the intricacies of science in a format that is best understood by the public is like mastering an art. That is one aspect, but we may also want to make our compatriots appreciate the role of science as a reasoning strategy that will help people take evidence-based decisions against the current onslaught of fake news, conspiracy theories and manufactured ‘truths’ – the downside of the information revolution. Not that the irrationality that produces a warped worldview in the victims’ minds is new, but the dissemination of such mind-influencing material becomes exponentially faster and reaches millions of consumers in seconds, thanks to information technology. We also observe how disinformation weakens human rights and many elements of democracy.

The scientists who became celebrated communicators in the western world like Carl Sagan, Stephen Hawking, Steven Weinberg, Stephen Jay Gould, Carlo Rovelli, Richard Dawkins and Neil deGrasse Tyson or our own Yash Pal, Pushpa Bhargava and Jayant Narlikar have been hammering on one single predominant idea. That is about developing a knack for critical thinking using the time-tested and highly successful methodologies followed in science. The author of the book ‘The Joy of Science’, Jim Al-Khalili, a theoretical physicist and one of the foremost science communicators/commentators of our times, continues this noble legacy of his predecessors and contemporaries in an exemplary

way. He is also a presenter for a much-followed radio programme, ‘The Life Scientific’ on BBC. Written during one of those Covid lockdown periods, in this short book that can be read in one sitting, Al-Khalili, weaves an inspiring tale upholding the need for adopting rationality and a scientific approach in our lives. He argues that a scientific approach is ‘one of humankind’s great riches and the birthright of everyone.’

The ‘Joy of Science’ highlights the efficacy of scientific methods to be used in myriad life situations, that too in a world full of contradictions and complexities where each of us requires taking the best possible decision – not an easy thing to do under given circumstances. Several features like falsifiability, repeatability, readiness to admit mistakes and scope for improving the quality of outcome stand out in the practice of science. These are also the features that distinguish scientific methods from the existing alternate ways of thinking, like the practice of religious ideologies. Most importantly, any outcome will be tested again and again against evidence. If the result or conclusion fails to hold up against evidentiary data, it is discarded, and the whole methodological exercise starts all over again until the result objectively mimics the reality out there. The ‘Joy of Science’ presents eight pithily written lessons in eight chapters on how ‘we can import the best features of the scientific process into our wider decision-making and opinion-forming processes in daily lives’.

Worldwide, including in the advanced countries, pseudoscience is everywhere, whether denying the science of climate change or the theory of evolution that explains the secret of diversity we see around. The Pew Research Center reports that in America, one-in-five adults reject the theory of evolution that explains the origin and development of life on Earth and believe in God-mediated creationism. India is no exception in providing a fertile ground for pseudoscience to prevail, including sometimes the Government Departments. This often leads groups of scientists from around India to criticize the proposals sharply and demand their withdrawal by the Government and redirect funds for more legitimate branches of scientific studies. A former Indian minister of Higher Education wanted to remove the theory of evolution from the school curricula because, as he says, no one ‘ever saw an ape turning into a human being’. More than 2000 scientists signed a petition calling out the Minister’s statement that lacks any scientific basis. We have also

seen attempts from the votaries of pseudoscience pushing unproven potions and pills to misguide the people on boosting their immunity against COVID-19. In a world weighed down by misinformation propagated by climate-change denialists and anti-vaccination advocates, the book underscores the need to push back such misrepresentations of facts, amplified through social media platforms or what is termed as ‘infodemic’ by the World Health Organization.

How do you explain the refusal of politicians and administrators to move away from a blind belief even while it is stacked against scientifically proven facts? We realize that we are against a whole load of cognitive biases that encourage pseudoscience. Al-Khalili discusses several of these biases that sustain this mental decrepitude – the refusal to see the objective reality and the tendency to cling to one’s initial belief even after receiving contradictory evidence. Al-Khalili discusses one of the cognitive biases in his book: the Dunning-Kruger effect, which can be summarized as ‘ignorance begets confidence’. The less you know, the more you perceive yourself to be an expert – a combination of poor self-awareness and low cognitive ability. Conversely, the more your knowledge is, the more uncertain you become and end up as a biblical ‘Doubting Thomas’. Another source of mental inflexibility is ‘confirmation bias’, defined in the book as ‘the tendency to expose oneself only to those opinions and beliefs that confirm what one already thinks and accepts only the evidence that supports this’.

Al-Khalili reminds us why the scientific method with its embedded features like falsifiability, repeatability, the significance of uncertainty, and the value of admitting mistakes is increasingly becoming apposite in the difficult times we live in – a world that is drifting towards, as many scholars believe, ‘a post-truth world order’ a condition of our times that thrives on appeals to our emotions and personal beliefs rather than based on objective facts supported by evidence. The book guides those who want to cherish their intellectual freedom and live scientifically – to borrow his words, ‘to mitigate a fear of the unknown with a sense of promise, potential, and even excitement’.

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