

SCIENCE CAN BE MORE FUN THAN FUN

Work is more fun than fun. – Sir Noël Peirce Coward, playwright, composer, director, actor and singer (1899-1973).

The supreme accomplishment is to blur the line between work and play. – Arnold J. Toynbee, historian (1889-1975).

Why is science not always perceived as fun and play? Surely, it ought to be. Part of the problem, I believe, is that we think of science too narrowly. What is science, what is the scientific method, who should practice science, when, and for what purpose? We tend to answer all these questions very narrowly and very conservatively. We think of science as complicated and difficult to pursue, to communicate, to teach and, therefore, to learn. This is a great shame, and needs to change. I am endeavouring to make a small contribution toward such a change by writing a regular column for the online portal *The Wire Science*. As a first step, I have called my column 'More Fun Than Fun'. My articles are being translated into Kannada by Shri Kollegala Sharma. The Kannada text is published in *The Wire Science*, and is being narrated by Dr. J. R. Manjunatha in the daily Kannada science podcast "Janasuddi". It is my hope to inspire students and teachers to change our perception of science.

In each short article, I try to show three things. First, science is fun. Second, almost anybody can practice science. Third, that science can contribute to all spheres of human knowledge. I also focus as much on the process of science as on its products because I believe that the journey is more important than the destination. I am trying to convey the message that science is not just a set of ready-made gifts that scientists offer to the rest of the world. Instead, science is a way of life that we can all practice, and be both happy and wise. Through examples of scientific research that almost anyone armed with curiosity and a spirit of adventure could have done, even without sophisticated laboratories and big grants, I hope to democratise science. It is my hope to show that none

of us have to be content with being mere consumers of knowledge. Everyone, especially young students and amateur scientists, can become producers of knowledge in science. But there is only so much that a passive column can accomplish. As teachers having the privilege and responsibility of shaping young minds, you can of course do much more, and hence this message to you.

Box 1. Check out:

1. My column 'More Fun Than Fun':
 - In English: <https://science.thewire.in/the-sciences/more-fun-than-fun-science-stories-raghavendra-gadagkar/>.
 - In Kannada: <https://science.thewire.in/the-sciences/raghavendra-gadagkar-column-kannada-podcast-kollegala-sharma-janasuddi/>.
 - Narrated by Dr. J. R. Manjunatha in the daily Kannada science podcast "Janasuddi": <https://anchor.fm/kollegala/episodes/4-1-ek0ils/>.
2. Shri Kollegala Sharma's article 'Why does science communication excite me?': <https://indiabioscience.org/columns/opinion/why-does-science-communication-excite-me>.
3. My answer to the question posed by the French Academy of Sciences on their 350th birthday: https://insa.nic.in/writereaddata/UploadedFiles/PINSA/2016_Art109.pdf.
4. Alison Gopnik's book *The Gardener and the Carpenter*: <https://us.macmillan.com/books/9781250132253>.

On their 350th birthday, the French Academy of Sciences invited the presidents of many science academies across the world to address the following question: 'What tools do we need to understand the universe?'. My answer was that we cannot predict the future of the universe and, therefore, we cannot know what tools we will need in the future. All that we can and need to do is to nurture the human mind, the minds of future generations of humans. This is the single most important tool that will allow us to invent and construct whatever other tools we might need at any time in the future, to face any contingency,

good or bad, pleasant or otherwise. And the “we” here refers primarily to teachers.

Our present system of education is, however, rather flawed – we feed students with facts rather than teach them how to think. We destroy their curiosity and creativity, and replace them with ‘knowledge’. Sometimes I find that the less educated a student is, the brighter and more intelligent she is; the more likely to be able to solve problems *de novo*. I often joke that I have to ‘cure’ my students of their education, before I can nurture them into thinkers and problem solvers. You have the power to change this. In her book entitled *The Gardener and the Carpenter*, the child psychologist Alison Gopnik laments our over-emphasis on goal-directed ‘Exploit Learning’, and our neglect of playful ‘Explore Learning’. Nowhere is this more damaging than

in science education. Gopnik’s advice is that we should not be like carpenters – shaping children to fit the model of an adult that we have in mind. Instead we should be like gardeners – providing a protected and nurturing environment for children to flourish and realize their potential. This was her advice for parents, but I think it is even more apt for teachers.

Whether as science teachers, communicators, or researchers, we must ponder the words of Glenn T. Seaborg, scientist, Nobel laureate (1912–1999): *“There is a beauty in discovery. There is mathematics in music, a kinship of science and poetry in the description of nature, and exquisite form in a molecule. Attempts to place different disciplines in different camps are revealed as artificial in the face of the unity of knowledge”*.



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