

Responsibility of Scientists towards Building Scientific Temper in Society

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WHEN WE TALK ABOUT science communication, we generally discuss “How should we communicate science?” But today, I am going to talk about “What kind of science should we be communicating?”

Typically, masses are excited about development of science and hence newspapers’ science sections (wherever it exists) are dominated by news about latest discoveries and futuristic technologies. Some of those news also find some space in private news channels. This is one kind of science communication. Many educationists would like to say primary purpose of science communication is to make the curricular science interesting for students. So one can develop some simple hands on experiments, make youtube videos, run a Q&A column in a magazine, develop a mobile app, there are many ways to go about it. That’s second kind of science communication. When I was a student, the highlight of our weekly television schedule used to be a show called ‘Turning Point’. If my memory serves right, I have seen it being hosted by Prof. Jayant Narlikar, Prof. Yash Pal and few episodes by Mr. Girish Karnad. This show had a nice blend of two kinds of science communication I just mentioned.

But there is also a third kind of science communication. To explain that, first we have to ask ourselves a seemingly simple

question, “what is science? What do you mean when you say you have learnt science? Is it just a body of facts? Is it some abstract thought which manifests itself in form of new technology? Or is it something more?” I believe science is a process which is less about the end result, but more about the journey in itself. The rigour of scientific method is the most important lesson one should take home from your science classes. Once you have done that, you realise that science is not just another subject from school, but science can be your philosophy of life. Scientific temper is just realisation of this one simple fact.

One cannot keep science confined to our school textbooks. We should learn to apply it in every action in our life. “I do something, because I have seen it gives results” may seem like a good practical approach, but it is certainly not a scientific one. Unless you try to investigate “why it seems to give results?” you will not know if it really works or is it some kind of spurious correlation or is your brain playing tricks on you, by only selectively recalling favourable data. If you want to know how spurious correlations can trick you, I recommend website of Tyler Vigen and to know how selective memory works, or what psychologists call as confirmation bias, watch YouTube videos of James Randi, a well known US based debunker of psychic powers.

The point I am trying to make here is

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General Article

that there is need for third kind of science communication. The science communication targeted towards masses which tells them that science they learnt in their school / college should be applied in their daily life with proper rigour. We are seeing a society around us where a large number of people complete the degrees in science / engineering / medicine, but never internalise the process of science. Due to their paper qualifications, masses (and in most cases those people themselves) believe that they have proper understanding of what is science and they can separate chalk from cheese, when they encounter some new seemingly scientific information. Sadly, the reality is very different. I don't have hard data to prove it, but my own experience in science outreach has led me to believe that an overwhelming majority of people who fall prey to pseudo-scientific nonsense are people with science / technology degrees. Many of them are also practicing scientists. Although it may seem counter intuitive, the logic behind it is probably not too difficult. Those who have studied other disciplines, readily accept that they have poor understanding of science and when a scientist or science communicator tells them that their beliefs are pseudo-scientific, they readily believe the 'expert'. However, in case of those with science degrees, it is much harder for them to accept that they were fooled by meaningless jargon and hence when experts tell them that they are wrong, their natural reaction is to either question the authority of experts or to invent more convoluted, meaningless explanations to cling on to their beliefs.

As a result, we have a society where educated people believe astrology is real. The horoscopes are matched for marriages, news channels spend mornings on astrology related programming and so on. In Indian context, astrology is the most overt

kind of pseudo-scientific nonsense, but it is hardly the only one. There is palmistry, feng shui, reiki, numerology and so on. But beyond these there is a new kind of monster which is raising its ugly head in recent years. In one short phrase one can call it "great ancient past". In last few years, there is rising tendency to ascribe some seemingly scientific meaning to every cultural tradition and belief. Some of these explanations are so convoluted that they may seem unbelievable even in a satire on the subject, but still there are people who propose it and there are much greater number of people who actually believe it.

We have seen our prime minister telling a conference of doctors that Ganesha's head is an example of plastic surgery. We have seen MoS of HRD telling that airplanes were invented in India by one Shivram Bapuji Talpade. We have seen Indian Science Congress accepting a 'paper' about health benefits of konch blowing. We have seen the famous Sadhguru Jaggi Vasudev, who was conferred Padma Vibhushan this year, telling why it makes scientific sense to not eat anything during eclipses or why his ashram on the 11th parallel is at the best location on the Earth, where gravity is most wonderful. We have seen IIT Kharagpur including Vaastu in its architectural curriculum or Junagarh Agricultural University claiming to find gold in cow urine. We have seen a 2 day circus (which was named as a scientific conference) sponsored by MP government, which declared that cow dung can save you from all kinds of radiation and cancer. The list is endless.

I am not making a case that everything which is ancient is bad. Our ancestors had developed a number of scientific theories which were ahead of their times. If you want to know more about it just talk to Prof. Ramsubramaniam from HSS department of IIT Bombay or Prof. Mayank Vahia

General Article

in TIFR. But the key part here is “ahead of their time”. If you start finding 21st century science in ancient literature, it becomes embarrassing. Not just embarrassing, it also eclipses genuine research on scientific development in ancient India and makes non-Indian researchers more skeptical about any claim coming out of India.

In such a situation, scientists bear responsibility of holding the torch of reason. About 16 years back, when Dr. M. M. Joshi, then HRD minister, tried pressurising UGC into introducing Astrology as a curricular subject in all universities, Prof. Jayant Narlikar, Prof. Yash Pal and Prof. P. M. Bhargava led the signature campaign of scientists against that move and forced UGC to back down. Even before that, the conference on scientific temper organised by Prof. P. M. Bhargava and Prof. Obaid Siddiqi in 1970s, with the help from Nehru Centre in Mumbai, first brought idea of scientific temper in public discourse and it eventually led to introduction of article 51(1)h of Indian constitution which stipulates that it is fundamental duty of every Indian citizen to adhere to scientific temper.

However, in present time, we the scientists seem to be failing in our duty. No doubt we had our March for Science on 9th August 2017, but I will remember the march for the fact that very small fraction of scientists from mainstream institutes bothered to show up for it. I don't understand, if not now, then when? In last four years, we have seen Dabholkar, Pansare, Kulburgi, Gauri Lankesh murdered for propagating

rationalist thought. Still we think it is not a pressing issue? Worse, we see members of scientific community encouraging pseudo-science. A so called 'spiritual organisation' destroys flood-plains of a river in the name of a 'culture festival' and has audacity to tell the National Green Tribunal that they cannot be held accountable because it was responsibility of government to stop them. Even after that many scientific institutes have thriving chapters of this Art of Living foundation? Why?

One may hold any irrational belief in your own personal life and do any pooja in confines of your own home, but if as a chair of a scientific organisation, you take replicas of satellite to Tirupati as offering before every launch, what message are you sending to the masses? It is bad enough that ministers who lack scientific training, think it is desirable to have a Committee and special source of funding for research on cow urine and cow dung, but do we have to make it even worse by chairing such a preposterous committee and lending it credibility through our endorsement?

Time has come for scientists to say 'enough is enough'. Last decade it was turn of Prof. Bhargava, Prof. Yash Pal and Prof. Narlikar to lead the charge. Now, sadly two of them are not amongst us and Prof. Narlikar has reduced his public engagements. This is the time for scientific stalwarts of next generation to step in their shoes and make voice of scientists heard. If they cannot do that, they are failing not just fellow scientists but the progress of science itself. □