

Editorial*

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Resonance – journal of science education dedicates this issue to all the teachers as “Teachers Day” is celebrated on 5th September, across the country.

This land of ours has always kept teachers on a high pedestal. Children are taught early on, “Mata, Pita, Guru Deivam”. Many of us would swear how our teachers have guided us in our life. I grew up for a few years at my uncle’s house as he was a school teacher. I was fond of my Tamil teacher in the Government High School in Sathyamangalam. He was a Gandhian and a strict disciplinarian, who taught us Tamil grammar. In college, the physics demonstrator showed me the way to scholarship. One of the professors at the University mentored me all the way until he passed away recently. I remember fondly my thesis supervisor and my post-doctoral supervisor. Each one of my teachers taught me certain values at every stage of my life. As I became a teacher myself, my students became my teachers. As my children were growing up, they taught me many things. Learning is a lifelong process. When learning stops, we stop living.

I am happy that the September issue features Professor D S Kothari, a scientist, teacher, administrator, and humanist as his student and the author of the Article-in-a-Box, Professor Amit Roy puts it. Kothari played the role of a teacher beyond the boundaries of Delhi University. Roy recalls how he was privileged not only to be selected in the first batch of science talent scholars by Kothari but also to be taught quantum mechanics by him at Delhi University. I fondly remember Professor Kothari walking through our physics lab when he was the Chairman, University Grants Commission (UGC).



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Having lost his father, he grew up with the support of his father's friend and went to Allahabad and Cambridge on scholarship. His story is truly inspirational for the younger generation.

I am particularly pleased that a diagram from the work of Kothari with Chandrasekhar adorns the cover page of the issue. It is reproduced from Gamow's book, *The Birth and Death of the Sun*. A picture is worth a thousand words. I leave it to the reader to discern as much he/she can from the figure. When I was a student, I wondered why we use Greek alphabets as symbols and not Tamil alphabets. Chandrasekhar showed long ago that it was possible to use Tamil letters in science literature.

Kothari was a multi-faceted personality. In addition to teaching and guiding research in Delhi university, he was able to advise the government on defense matters. It would not be an exaggeration if we say that he laid the foundations for defense research in the country. He was definitely a guiding light as the Chairman, UGC.

He went beyond thinking about stars and galaxies. He thought deeply and talked about the complementarity of mind and matter. You may like to read the article about the mind behind the Hebbian synapse by Shriya Palchaudhuri.

In keeping with the research interests of Kothari, Priya Hasan raises the question, "Will Betelgeuse explode?" and goes about answering it.

When we pursue higher studies and become teachers, the first day in the class is often a disaster. But we learn quickly. As we learn to pursue our research and guide PhD students, we learn to balance between teaching and research. We learn to teach things from what we research on and use the concepts that we explain to our students to further our research. Some of my own research papers have come out of my classroom teaching. In this issue of *Resonance*, Rajyaguru, a young faculty member shares his experience as a beginning teacher and a researcher, and how he has learned to combine both to his benefit. As a friend of mine puts it, faculty members in academic institutions are hired to teach and are promoted on the basis of their research. As a result, many



young colleagues tend to neglect the teaching part without realizing the opportunity they have to enthuse and encourage an entire generation. The biography of the Nobel Laureate S. Chandrasekhar points out how he used to drive early in the morning to the University of Chicago to teach a class of two students, and the whole class got the Nobel Prize (much before the teacher did)! What more can you ask?

Many of us (are happy to) teach undergraduates out of a chosen textbook. We believe in making them do the exercises at the end of each chapter, emphasizing on the need to get the concepts clear. In many universities and colleges, the professor prepares his/her own notes for the course and eventually publishes a textbook that reflects the state of the art. It is not easy to do that for the first course in physics. P C Deshmukh has done that in his book on *Foundations of Classical Mechanics*. The beauty of the book is explained by Dipanjan Chakraborty in this issue.

You might have watched people playing with the Hula Hoop. Kushal Lodha and coauthors discuss the physics of a particle on a rotating hoop in this issue.

Is electron a particle or a wave? Since it has a mass and a charge, it must be a particle. Since it diffracts like X-rays, it must be a wave. In the classroom section, Chetan Kotabage discusses G P Thompson's experiment of electron diffraction.

If you thought that the September issue of *Resonance* is all about physics, I do not blame you. But I want to assure you that there is a bit of mathematics, a bit of biology and a bit of chemistry in each issue. Many of us who have written our own computer programs would recollect our experience in writing down the algorithm, drawing a flow chart, and then writing down the computer program in whatever language we chose to write it in. Often one wonders how efficient it would be and how error-free it would be. You can always find a smart guy who can rewrite your code, and make it more efficient. But can you prove if a given program is the shortest? Read the article by Arindama Singh to find out how.

If you had read the August issue of *Resonance* and found out



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what a beautiful model system *Drosophila* is, I suggest, you read the September issue to find out how *Hydra* is a powerful model organism, particularly when it comes to regeneration.

Many of my friends used to complain about inorganic chemistry because they had to memorize many reactions. However, I was always fascinated with the periodic table and the systematization of inorganic chemistry. N Rajesh explains to us how he could make inorganic chemistry fascinate his students.

Overall, the September issue of *Resonance* is all about mind and matter and men and women who matter!

