

# ARVIND GUPTA: SCIENTIST TURNED TOYMAKER

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It's an unrelentingly hot summer day in Pune. Arvind Gupta's space in Pune University's IUCAA campus looks like a laboratory from a Roald Dahl story. A hydraulic crane made of disposable syringes and saline tubes, a water squirter made of a drinking straw, a periscope made of pencil boxes, a levitating pencil, puppets that climb on a wall. And these are the inhabitants of a single shelf in this colourful, crowded room.

Toymaker, writer, scientist, engineer and bibliophile - Gupta wears epithets with disarming humility. Dressed in a lavender khadi kurta and brown corduroys, carrying his famous 'toy bag'. Anyone who has met him has doubtlessly noticed this Army surplus canvas bag, filled to bursting point with every manner of odds and ends. Things that most of us would discard as junk - discarded wool and buttons, used straws, matchboxes, rubber slipper soles, pencil stubs, empty ballpoint pen refills. The bag has traveled with him to over 1500 schools and 20 countries.

Arvind Gupta moves continuously. There is rarely a still photograph to be had. When he pauses, it is to pull out an interesting newspaper cutting, or carry out a quick demo - make a tone-changing flute, for example. His toymaking is always accompanied by riveting stories about people, about the world around us, about science. His official job at the Muktangan Vigyan

Shodhika is to figure out ways to make science irresistible to children via low cost science toys that they can make on their own. Another ongoing effort is to make educational books and resources freely available online and to translate books on education into various Indian languages. Here are excerpts of our conversation.

## TELL US ABOUT LIFE BEFORE YOUR CURRENT AVATAR AS CHIEF TOYMAKER...

AG: I come from Bareilly in Uttar Pradesh. Thanks to a very supportive family, I had the luxury of a good school education, and went to IIT Kanpur after that. I joined Telco, Pune, in 1975 - when I was twenty two years old. Telco was a great place to work - I cherish the experience - but I got tired of making trucks. I went on to work with the Hoshangabad Science Teaching Program; and then the UGC, NCERT, National Book Trust and other organisations for the popularisation of science, taught at Mirambika Free Progress School (Delhi). I moved back to Pune four years ago with my wife Sunita. She teaches Sociology at Fergusson college.

## WHO HAVE BEEN YOUR PERSONAL HEROES?

AG: While I was still at Telco, I took a break and worked for six months with Laurie Baker - my college





A young enthusiast is introduced to the hydraulic crane powered by syringes and saline tubes

day icon. Unlike most architects who spit on tradition, Laurie's work was always in harmony with it.

He used to say, "When you look at a village house, look at it with humility and respect – you probably can't improve upon it with all your knowledge, because it has come from a thousand years of R&D. It has emerged out of the needs of the people, out of materials available to them, it has sheltered them for centuries."

Another thing about Laurie Baker, he was a man of such humour - most people in the social sector look like they are carrying the weight of the world on their shoulders! Baker is definitely one of the greatest human beings I have met.

(AT THE MUKTANGAN VIGYAN SHODHIKA)  
WE DO NOT DEAL WITH CURRICULUMS. WE  
DEAL WITH IDEAS. SHOWING POSSIBILITIES  
WITH SIMPLE MATERIAL IN OUR OWN LIVES.  
IF YOU CANNOT MANAGE THAT, YOU  
SHOULD QUIT SCIENCE.

#### HOW DID MUKTANGAN VIGYAN SHODHIKA START?

AG: Prof. Jayant Narlikar of IUCAA invited me to start working with the science centre here as a visiting scientist. Muktagan Vigyan Shodhika was funded by the legendary Marathi writer, PL Deshpande - a friend of Prof. Narlikar's from his Cambridge days. I was not immediately ready, but realised that a loner cannot do too much. Being with a small group empowers you. So I mulled over Prof. Narlikar's proposal and eventually decided to join.

I must say that I now have the best team one could ask for Vidula (Mhaiskar) is a microbiologist by training, she worked at Stanford for four years. Ashok (Rupner) comes from the village Surodi - his parents work on the fields, and he was the first child in his village to get an MSc. Together, we've found an inspired corner in this organisation.

A lot of our work is backward integration. Great work has been done by people across the world. Our job is to make it simple, make it do-able with common materials that you'd find all around you. Even the simplest raw material has the potential to open up possibilities, open up your mind.

**MOST PEOPLE IN THE SOCIAL SECTOR LOOK LIKE THEY ARE CARRYING THE WEIGHT OF THE WORLD ON THEIR SHOULDERS.**

We conduct hands-on workshops for children. We have conducted two hundred of them this year. All our workshops are free - the only thing children need to bring along is newspapers and a pair of scissors. They take back whatever they make. Students of Municipal schools and girl students are given priority.

We have just one mission - to get the gleam back into a child's eyes. We do not deal with curriculums here. We deal with ideas. Showing possibilities with simple material in our own lives. If you cannot manage that, you should quit science.

**WHAT ABOUT THE ROLE OF SCIENCE CENTRES ACROSS THE COUNTRY?**

AG: Most science centres, sadly, thrive on making simple things difficult. People import all sort of ideas and apparatus, but do not look at their own backyards for ideas or material. Guards with batons patrol these centres - intimidating children instead of inviting them to explore.

Science centres seem designed to intimidate. The signal they sent to children is - "You don't have these lasers and fancy shining instruments, so what will *you* be able to do?" You should be able to say to a child, "Go and pick up an empty matchbox or Frooti pack, I'll teach you how to make things".

Children have such dexterous fingers - that is why this experimenting, playing and making of toys works well with them. They *like* playing with things that they have made themselves.

**DO HANDMADE TOYS MANAGE TO HOLD THEIR APPEAL IN A WORLD FILLED WITH SLICK READYMADE TOYS?**

AG: Parents are constantly telling their children to be careful with their toys - not to break them. So much so, that I know of a child who kept aside the expensive doll that came out of a box, and started playing with the box instead. With the box, she had no fear of being admonished. She could imagine the box to be whatever she wanted it to be - not so with the doll who already came with a name, a face and readymade accessories. *(Laughs)* I firmly believe that the best thing a child can



Inhabitants of colourful shelves



Levitating pencil, and some of the books Arvind has written

do with a toy is break it. Why does a child want to break a toy? Because she wants to see "Iskey pet mein kya hai?" (What's in its stomach?) Unless she satiates this curiosity she isn't satisfied. Children are eternal discoverers. Good toys must *invite* dissection. If the dissection goes 'wrong' or the toy cannot be fixed again - the heavens are not going to fall!

**WHAT WORK HAVE YOU DONE WITH MOBILISING EDUCATIONAL RESOURCES AND BOOKS...**

Such tiny countries around the world have done such path breaking work with books and translations. But we have to the tune of 40 crore Hindi-speaking people, for example, that have no good reading material in their mother tongue. There is such paucity of good resources. In a population of more than one billion

**WHY DOES A CHILD WANT TO BREAK A TOY? BECAUSE SHE WANTS TO SEE "ISKEY PET MEIN KYA HAI?" (WHAT'S IN ITS STOMACH?) GOOD TOYS MUST INVITE DISSECTION.**



A tantalising tabletop invites you to get your hands dirty

people – there are next to no decent public libraries. An organization that has printed over a thousand science books in Malayalam once invited me to one of their book exhibitions. Their books are meant for lay people. When I saw the publications, I told them “I don’t like the books you print – these are not good books.” They said, “Since you are so critical – why don’t YOU do some books for us?” I told them that I would.

This was in 1998, around the time of the Pokhran blast. I am a very positive person most of the time. People say I always rub a bit of my enthusiasm onto them. But the Pokhran matter got me very depressed. I looked round and there seemed to be no anti-war books in this country. It was then that I came across a Japanese story called ‘Sadako and the Thousand Cranes’ – a true story about a girl named Sadako Sasaki, who was diagnosed with leukemia as aftermath of the bomb dropped on nearby Hiroshima

when she was two year old. Sadako heard of a legend that making paper peace cranes would grant her a wish. She made a thousand cranes with the hope that she would get better again. Sadako died at the age of twelve. The story brought tears to my eyes. I knew I had to translate it. We now have 10 -12 such anti-war books, amongst hundreds of other translated titles in print and online.

**YOU HAVE LABOURED TO CREATE AN IMMENSE STOREHOUSE OF RESOURCES ON YOUR WEBSITE...**

**THERE ARE SO MANY INSPIRED TEACHERS IN THE UNLIKELIEST PLACES. DESPITE TEACHER TRAINING AND TEACHER SELECTION METHODS, NO SCHOOL HAS A MONOPOLY OVER GOOD TEACHERS. AND THESE TEACHERS STRUGGLE AGAINST SUCH ODDS AND STILL END UP DOING A GREAT JOB.**

We share 99.9% of our genes with the rest of humanity. The genome project has demonstrated this. All racist theories of white versus black versus brown have been thrown out of the window. If people only had a chance - they would be as good as anyone else.

Our people are as good or as bad as anyone anywhere in the world. There are so many inspired teachers in the unlikeliest places.

THE RESPONSE OF CIVIL SOCIETY SHOULD BE TO *SHARE*. NOT FOR MONEY, BUT FOR THE *LOVE* OF SHARING.

Despite teacher training and teacher selection methods, no school has a monopoly over good teachers, they're randomly distributed. And these teachers struggle against such odds - and still end up doing a great job. Tilak had said 'Swaraj is my birthright, and I will have it' - I have similar views on the sharing of knowledge. Copyrights were made in the caveman's era - I am copyleft in that regard. *(Laughs)* There are books that have been out of print for years - you couldn't buy them in a store if you wanted to. Someone would be doing everyone a favour by digitizing these and making them available again. The whole act of computers is about cutting, pasting, *sharing*. One of the good things APJ Abdul Kalam did in his tenure in the Rashtrapati Bhavan was that he got almost 25,000 books digitized.

Pune is supposed to be the Oxford of the East - but if you walk into any big bookstore, all you will find are ABC guides and management trash. Where is that gem on education that you are looking for? And if this is the state in cities, what are the people who are in smaller towns and villages supposed to do? The need to share knowledge is enormous.

The response of civil society should be to *share*. Not for money, but for the *love* of sharing. Whatever I do is a small effort towards doing just that. □

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Arvind Gupta has written several books which have been published by the Eklavya Educational Society and National Book Trust, amongst others. *Little Toys, Ten Little Fingers, String Games, Matchstick Models and Other Science Experiments, Pumps from the Dump, The Toy Bag, Toy Treasures* are some of his most acclaimed books. Many of these books have been translated and printed in various Indian languages.

WWW.ARVINDGUPTATOYS.COM has downloadable resources on education philosophy, science, toymaking etc.



Gupta's famous canvas 'toy bag'

"For any of us who grew up with dry pedants teaching us science, the excitement and frolic of science just completely passed us by. People like Arvind Gupta are a perfect antidote to that. He is animated with the joy of discovery, illuminated by his delight at fashioning stuff out of junk. Best of all, he's the consummate communicator. I've seen him with 7-year-olds, and with graduate engineers, and one thing was alike. All of them were lit up by his energy and enthusiasm. The other day, he packed in a lecture hall at IIT, no standing room, and he had them mesmerised. As an adult, spend an hour with him, and you start to see new possibilities on how science can be, and should be, taught. Imagine how wonderful it is to be a child and spend time with this genial science wizard! I hope to follow his lead in my own science work with children."

SRIDHAR RAJAN,  
Volunteer, Mirambika Free Progress School