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Theatre can be a powerful means of communicating the excitement and richness of science.

In an influential lecture at the University of Cambridge in 1959, the British chemist and novelist, C. P. Snow drew attention to the ever widening chasm between the sciences and the humanities in post-war Britain. He asserted that "... the intellectual life of the whole of western society is increasingly being split into two polar groups" – literary intellectuals on one side and physical scientists on the other.

Half a century later, in a distinctly warmer part of the world i.e. India, it would appear that the situation has not changed significantly. Of course, not being an intellectual by any stretch of imagination prevents me from commenting on the "intellectual life" of Indian society but I certainly think that the polarity that Snow pointed out is alive and kicking in our schools, colleges and daily lives.

In India, the hard lines between science, humanities and arts are drawn deep and early. Formally, this occurs after the Class 10 board exams, when students necessarily have to make a choice between Science, Arts or Commerce. From this point onwards, the rigidity of the formal education system offers little space to a 16-year-old who has a passion for say, both painting and physics (assuming that such s/he is interested in anything at all, after the brutal cramming of the previous 10 years). Unlike foreign universities, where one may easily combine a major in engineering with a minor in film studies, such possibilities are remote here. Is it any wonder that we rarely encounter the likes of Steve Jobs who inte-

grated engineering and calligraphy to develop the marvellous user interface of Apple products?

An increasingly specialised world forces us down straight and narrow paths that lead to a diminished appreciation of the richness of both the sciences and the arts. Yet, when the two converge the results can be unexpected and interesting. In the last few months, I have had the opportunity to be a part such a convergence. The amateur theatre group, that I sometimes work with, staged two plays about science and scientists – Copenhagen by Michael Frayn and Life of Galileo by Bertolt Brecht.



Scene from the play 'Copenhagen' by Michael Frayn's

Both plays are based on true incidents and feature historical characters. Copenhagen is a dramatised account of a mysterious meeting between two giants of modern atomic physics – Werner Heisenberg and Niels Bohr. The meeting took place in Bohr's house in Copenhagen in September, 1941 at the height of

the Second World War, at a time when Denmark was under German occupation. Heisenberg was one of the few physicists who had stayed on in Hitler's Germany unlike Einstein, Wolfgang Pauli, Max Born and many others who had crossed over to the Allies. Heisenberg, a deeply patriotic German, was accused of trying to build the atom bomb for Hitler, an allegation that he refuted time and again. Bohr on the other hand, was part of the Manhattan project that actually built the Allied atomic bombs that were ultimately unleashed upon Hiroshima and Nagasaki.

In a Rashomon like narrative structure, the play flits across time and space, interpreting and re-interpreting that fateful meeting between Bohr and Heisenberg, as multiple attempts are made to answer the crucial question – why did Heisenberg meet Bohr in Copenhagen in 1941? Each dramatic interpretation presents a different answer to the audience. Among others, the explanations include:

- 1) that Heisenberg tried to appeal to Bohr's conscience as a scientist hoping that he would be able to influence the allies to stop the Manhattan Project,
- 2) that Heisenberg tried to pick Bohr's brains to understand the physics of fission so that he could build the bomb himself and
- 3) that he came to explain how he was preventing the Nazi scientists from building the bomb and why he had to stay on in Germany.

The play operates at many levels – personal, political and scientific. It explores the personal and professional relationship between Bohr and Heisenberg, once friends and colleagues, but now pitted against each other. It brings out the very human dilemmas before the scientist, who engrossed in his research doesn't care "what the truth will lead to" but suddenly discovers that he is forced to care because of his innate humaneness.

Michael Frayn's *Copenhagen* is an incredibly complex and nuanced work – a three-hour long play liberally peppered with references to abstruse concepts such as the uncertainty principle, Schrodinger's Cat, matrix mechanics, the diffusion equation and so on, which make it a bizarrely difficult and intellectually demanding experience for any audience. When the play opened we were fairly sure that people would start leaving after half an hour.

Yet much to our surprise, we had packed houses and people sat attentively (the odd yawn apart) through the play. Audience members terrified of science said that they had no idea that atomic physics could be so interesting. Yet others said that they were fascinated by how history had come alive before them. Students with advanced degrees in science remarked how they had finally understood what quantum mechanics



Scene from the play 'Life of Galileo' by Bertolt Brecht

was really about (although this must be taken with a pinch of salt).

On the other hand, Brecht's *Life of Galileo*, which describes Galileo's struggles against the Church to establish the doctrine of heliocentrism, is much more accessible. To begin with, the science bits are mostly about stellar and planetary motions – much easier on the mind than quantum mechanics. The storyline is linear, there are light moments and the themes are



epic and dramatic – the battle between science and superstition, the power of the state versus the power of ideas, the needs of the flesh versus the yearnings of the soul, love versus integrity and so on.

However, it is a very verbose and a very long play that runs for nearly three hours. Not your usual Saturday night entertainment in an age where Twitter-length attention spans abound. Once again we were queasy when the play opened and once again the audience surprised us with their numbers and continued presence. What delighted us the most was the number of children who attended and how several of them later remarked that they had enjoyed the play.

Children are the best and most honest of critics. They don't care for names. Brecht and Galileo might as well be Martians in pink suits to them. If they get bored they make it amply clear very quickly. I wondered what would make a child of eleven or twelve sit still for three hours, to watch the story of a discovery that any eight year old knows about.

The answer of course, lies in the power of storytelling. And theatre tells the story of science in a different way altogether.



Classic Stage Company's staging of Bertolt Brecht's "Life of Galileo"

In school text books, Galileo's epic struggles are reduced to a single page of dry text with perhaps a diagram or two. But Brecht, in his masterly prose, explores many different dimensions of science and

scientific thinking – the rejection of authority ("truth is the child of time, not of authority"), the hollowness of theory without experimental evidence ("would you care to observe those impossible and unnecessary stars through the telescope"), the test of repeatability when validating theory ("fifty times the man weighs his pieces of ice") and the responsibility of science towards humanity (when Galileo describes scientists as "inventive dwarves").

Theatre can be a powerful means of communicating the excitement and richness of science. But what makes it a unique medium is its ability to uncover the messy human emotions that accompany the discovery of the cold and elegant equations that explain our world – the conflicts and the choices, the disappointments and the euphoria of people whom we know of, but do not really know.

Theatre provides the possibility of bridging the divide between science and art that Snow spoke of. Can it stimulate both the right and left brains and help develop more well rounded children? Can it excite more young people into considering science as a profession as opposed to engineering, medicine or management? Can it persuade painters in taking a greater interest in the science of colours? The experience of science theatre in India is too recent and the scale too tiny, to even attempt any answers.

But to my mind, the real value of theatre to science lies elsewhere.

We live in a country where superstitions and irrational thinking abound and frequently surface in many unpleasant ways – in the form of mobs stampeding to worship milk drinking Ganeshas, Chief Ministers who feed crows to ward off evil, lovers separated by uncooperative horoscopes and children who are made to fear eclipses.

If the theatre of science can provoke people to think about the world in which they live, in a scientific and rational way, it will have played its part well.

The author thanks Prakash Belawadi of the Centre for Film and Drama (CFD) for his valuable insights and suggestions.

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My Point of View

I was never the ideal student through my school days, ranked around thirty second once in a class of fifty four. Made it to cultural captain in my twelfth year and was evidently more interested in music and the arts. Got in through a college entrance exam and got my first whiff of the Fine Arts, a whiff that was to change my life forever.

And so I devoted five academic years to the arts, the first three of which really mattered. My mind was reeling with a rush of new information, I was interested in history and culture and suddenly... it all made sense. Here was a field of study so multi-disciplinary in nature that it linked everything else and made it significant. I exited my Master's programme receiving proficiency awards and a Gold Medal to my name.

There are few that have the luxury of loving their 'job' and I am one of them. I teach Visual Arts and lecture at both school and college. I particularly love teaching the International Baccalaureate program as the syllabus allows flexibility that is conducive to teaching art. I begin my class getting to know my students and slowly zone in on particular areas of art that interest them. Depending on the careers they want to pursue or their specific fields of interest, I chart out possible projects and workshops. Having a limited number of students in my class enables individualized teaching.

Through slide show presentations, videos, movies and libraries- art theory and art history are introduced. The students learn about the elements of art, basic perspective, design principles and work on several other exercises to hone their skill and sensitivity to media. They explore art history, art movements and the evolution of art across different cultural perspectives and are encouraged to draw parallels and make connections. Strong importance is placed on research and analysis in the IB where the student produces an investigation book at the end of two years summing up observations, documenting procedures and exploring new ideas.

Class demos familiarise the students with the common media and through trial and error we explore some not so con-

ventional media such as wire, packing tape, and several others that defy classification! The students are also encouraged to experiment with textiles, installations, happenings and performance art. News paper clippings, gallery tours and visits to artist communities such as Cholamandal Artist's Village help enhance a student's contemporary knowledge and keep them well informed of new and emerging media. At the end of two years they present their artworks and investigation books to an external examiner in a personal interview and are graded for the same. The results have been fairly remarkable considering the initial tentative steps.

I have had the occasional student join the course under the mistaken impression that art is 'easy'. We plod along and manage. But for those that are ready to take the plunge- they find themselves a new language, a powerful voice that is bold enough to pitch their opinions at the public and watch for reactions.

I look forward to my classes with a bunch of eager students from whom I have more to learn than teach. I take great joy in watching their faces light up when they've had their private epiphanies, walking around dazed by the gravity of an art concept they've suddenly assimilated. Some are enthusiastic to a point where I receive calls at any point of the day... or night might I add. X-ray sheets resulting from a broken bone turn into lamp shades, old watchmen's bicycles become part of an installation, thrown away bottle caps become a potent public message, art is a wonderful thing!

- Anisha Verghese

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