

The Role of Science Fiction in The Present Age of Science



Jayant Narlikar

Literature is the expression of society, said Charles Nodier. Robert, Lord Lytton stated that a nation's literature is always the biography of its humanity. Quotes like these tell us that the writings of various kinds at any given epoch give us a flavour of the society where they are produced. Today, often referred to as the age of science, scientific literature should indicate the level of scientific developments at the present times. Science writing in general can be broadly classified into the following categories:

1. Research papers on various scientific topics. These appear in specialist journals or in technical textbooks. A typical paper may be read by a very select group of specialists in the field, including research scholars.
2. Review articles which are aimed at a wider section of readership. They carry accounts of recent developments in a particular field of science, without going into great details which the reader can pick up from publications of type 1.
3. Articles and books which carry accounts of

a scientific field aimed at the educated layperson. These do not require a high level of technical knowledge, and seek to convey the important developments in that field as perceived by a large section of the society.

4. Encyclopedias, dictionaries and similar compendia which carry short accounts of diverse topics, to help the newcomer to the field.
5. Science fiction which includes stories and novels (even exercises in poetry) that have a scientific core but are otherwise fictional accounts of events based on that core.

I have contributed to scientific literature under all these categories in a small way. So what I have to say will be based on what I have read of works of others and in a much smaller way on my own personal experience. Since I am addressing a group of sci-fi writers and others interested in science writing for general dissemination, I will concentrate on the sci-fi aspect in the above list.

But let me make a statement, with which I hope, you will agree. In the above list the earlier items require technical knowledge of advanced order and so one may conclude that writing of this kind would be very difficult, more difficult than writing of the more popular kind. Quite the reverse is true! An expert in the field wishing to report research findings would express that information in a terse fashion...since the space for publication in a journal is at a premium and the author knows that the peers who would read that paper would be familiar with the technical jargon. So our expert does not have to spend time on ensuring how the writing could be made reader-friendly. On the other hand, popular science writing including science fiction needs to be in a format that the reader has no difficulty in following. Even more so for science fiction, since there the writing would be in competition with other (non-scientific) fiction and there is the danger of the reader putting it aside if it is burdened with too much pedagogical material.

Why write science fiction?

I have heard some distinguished literary experts say that anything written with a motive behind it is not good literature. I do not agree with this view, just as I do not share the view that real mathematics originates in totally abstract ideas. Although pure mathematics is an abstract discipline, it invariably originates through some concrete problem or puzzle in the real universe. Likewise, it is customary for the novelist to issue a disclaimer in the preface to the novel that all characters in it are imaginary and bear no resemblance to any living person whatsoever. In actuality this may be true, but most character lines drawn by any author are based on the totality of his or her experience of real life. Thus some trait of a known person gets into the character sketched in the novel even though the rest of the sketch may not be so. So it is with a work of literature: the author may have some message to convey in writing the book.

In the case of science fiction there can be many possible motives. One may be that the

author wishes to convey some crucial scientific idea but in the story mode rather than as a textbook. Indeed, one can compare this approach to the medicinal pill which is sugar coated in order to hide the bitter taste of the real medicine. People by and large are 'scared' of science. They automatically assume that anything that pertains to science will 'go above their head'. This fear of science is due in a large measure to the way we are taught science at school. The less said about that the better!

I may narrate a personal experience in this context. I was once scheduled to deliver a talk in the prestigious Vasant Vyakhyanmala of Pune. The topic of my talk was futuristic: 'The world, a hundred years from now'. I was planning to present the forecasts of future technologies as made at the time. That morning I met a college professor of Sanskrit in Pune. He knew me well and so had dropped in to say 'Hello'. As he left, he assured me that he was planning to attend my talk that evening, even though he was afraid that he would not understand a word of it. Like science, it seems that scientists also are objects of awe and fear!

Nevertheless, I feel that one should try to present science in story-mode wherever possible. Just as the classic Panchatantra stories evolved out of the purpose of training some 'unteachable' students the art of living, one should try to present science in fiction form even though some of the readership is 'scared of science'.

There was another, rather unusual motive that inspired the distinguished astrophysicist Fred Hoyle to write his first sci-fi novel. In the early 1950s, Hoyle had the idea that interstellar space has regions that contain chemical molecules. He wrote scientific papers on this topic and sent them for publication in reputed scientific journals. They all came back, rejected. For, the research journals have a peer review system for judging the suitability of a paper for publication. In the 1950s most astronomers believed that the interstellar space contains hydrogen atoms only. They could not reconcile their beliefs to the idea that molecular structures

can survive in space. So Hoyle was faced with a black-out on his ideas. Undaunted, he wrote a science fiction novel called *The Black Cloud*, in which he proposed the concept of vast clouds of molecules occupying the interstellar spaces. The novel was immensely successful as a science fiction enterprise. At the end of the 1950s decade, however, millimetre wave technology had advanced to a level where astronomers could probe the interstellar space with millimetre wavelength radiation received by suitably designed dish-antennas. The analysis of the radiation revealed that it had been emitted by specific molecules in interstellar clouds, precisely as Hoyle had anticipated in *The Black Cloud*. Today the existence of such giant molecular clouds is taken for granted. Yet one can say that this was a case of sci-fi anticipating real science.

Sci-fi and reality

The example of Fred Hoyle's science fiction tells us that there are, albeit rare, instances of science fiction anticipating real situations, if not contemporarily, then at a later stage. The writings of Jules Verne are classic in this sense. His novel on travel to the Moon, for example, anticipated by a century, the reality of Apollo 11 mission of 1969. The writings of H.G. Wells, and later by others like Arthur C. Clarke, Isaac Asimov and Ray Bradbury also contain perceptive references to situations that developed later. Although not in science fiction, but in a futuristic essay Clarke had written about the possibility of geo-stationary satellites playing a role in communications technology. That was in 1945. The reality of such a technology came about some four decades later when man had succeeded in making rockets that could launch satellites in such orbits.

At a more modest level, I may add that in 1976, I had written a story on the possibility of a comet approaching the Earth on a trajectory which would lead to a head on collision. How to save the Earth from such a catastrophe? Scientists successfully launch a spaceship with a nuclear device that explodes near the comet, changing

its trajectory. In the late 1980s, NASA was seriously considering an action of this kind in the problematic situation of a comet or a satellite on a collision course with the Earth. In fact today there is a Spacewatch mission with a dedicated telescope whose job is to study the trajectories of all such solar system objects so as to find out if there is the likelihood of any of them striking the Earth. If such a possibility were to be found, then preventive action as described above can be taken.

But perhaps it is more than a cliché to say that 'good science fiction of today is the reality of tomorrow'. I recall being present in the audience in the Beckman Auditorium at Caltech to listen to a debate between Fred Hoyle and the famous sci-fi writer Ray Bradbury. The topic under discussion was: *The Message of Science Fiction: Prophetic or Profane?* At this talk, Bradbury pointed out that a person of his generation, born around the time of the First World War, had lived to see many achievements of science translate from fiction to reality. Nuclear bomb, man on the Moon, fast but compact computers, jet travel, easy worldwide communication, etc., were on the pages of science fiction when Bradbury was born. They became reality in his lifetime.

So one can say that in the fast moving world of today, the miracles of science and technology are translating science fiction into reality. By the same token, we can argue that whatever is being written today on pages of science fiction, may become reality of tomorrow.

Good and bad science fiction

What I just said applies not to all science fiction. Indeed, it applies only to a small fraction of it, which is 'good'. This brings me to what is 'good' and what is 'bad' in science fiction. Of course while I give my own definitions, I am conscious that my views may not be shared by all.

Good science fiction is generally based on science extrapolated from what is known, at a level that can be foreseen to be within the realm

of the possible. Computers, biotechnology, nanotechnology, etc. are fields today that provide ample opportunities to gaze into the crystal ball to decide where they will be in the decades to come. Not all our guesses will be right; yet what we foresee may not be inconsistent with what we already know.

I would like the sci-fi literature to be also conscious of the science-society interaction. Thus there are issues like stem cells research, cloning, etc. in biology, researches into nuclear devices, the spying capability of remote sensing satellites, which raise moral and social questions. By imagining future scenarios, a good science fiction story could alert us about possible dangers. We have already seen how the possibility of knowing the sex of the unborn child can raise horrendous issues, a possibility that I had written about in a science fiction story in the 1970s.

The Jules Verne novel *Round the World in Eighty Days* reads like an adventure story until at the end the reader discovers in a dramatic fashion the scientific fact about the shortening of the day as one travels East because of the West to East spin of the Earth. Thus science is introduced in a very subtle way. I feel that the success of science fiction lies in how subtly and 'painlessly' the reader is made aware of science.

Sometimes, especially in the context of astronomical time scales, the reader needs to be made aware of the rather short durations that our lifespans occupy in comparison with the cosmic time scales. Rather than explicitly state this fact, the underlying plot of the story should bring it out in a subtle way. I was conscious of this requirement when I wrote the story about the explosion of a nearby supernova, the ejecta of which hit the Earth at a later time. The supernova explosion is a comparatively short-term phenomenon. Yet I had to show that it related to nearly three millennia of us humans. The reader should judge if the plot meets the requirement I just laid down.

I now turn to what I think is 'bad' science fiction. As I mentioned above, one can and should take some liberties with known science.

Any such liberties need to be justified within the context of the plot of the story. However, there are several sci-fi stories written and read that do not satisfy this requirement. One example may suffice.

In one science fiction novel from the West, which I read recently, there were space ships travelling across the Galaxy within a matter of a few years. Astronomy tells us that the fastest known entity so far known to physics is light and that takes nearly a hundred thousand years to travel across the diameter of the Galactic disc. The typical time scale relating to distances across the Milky Way is thus of the order of a thousand years. I can accept a faster-than-light space ship provided some background is given of the technology it is based on and how it circumvents the restriction imposed by special relativity. No such discussion was given. To me therefore this was no better than a fairy tale based on the cosmic background. After all, in a fairy tale the fairy gives the prince magic boots that take him anywhere instantaneously!

For the same reason, I am not a fan of films of the Star Wars type. There is no science involved in those films. The plot is like any other adventure movie, with strange beasts and interstellar spacecrafts in place of horses and cabs of the typical Western.

Horror often masquerades as science fiction. This genre of stories can be more harmful to the growth of healthy science fiction. For, it may generate irrational fear about science and the devices science makes. As I have mentioned before, good sci-fi can warn the society against the harmful applications of a technology; but that warning is based on a reasoned argument, not on irrational fear. In fact horror-based stories may seek to legitimize the paranormal or pseudo-science.

Plots based on aliens on flying saucers or living in the Bermuda Triangle keep appearing under the garb of sci-fi. So far as the former are concerned, there has so far been no evidence that a flying saucer with aliens has visited the Earth. One can still imagine that some UFO may be of

this kind and base a plot around it. Then it is the responsibility of the author to give credible arguments for his proposed scenario. One does not see this responsibility being discharged in such plots. So far as the Bermuda Triangle is concerned, it is like flogging a dead horse. It is now recognized after scientific studies that the claims made for this triangle were far-fetched and not based on factual evidence.

I think the worst offender as bad sci-fi, is a story that shows plain logical inconsistency in its statements. I saw one story, for example, in which a scientist is abducted by aliens in the Bermuda Triangle. The news is reported in the media as it was the first such disappearance in the triangle area. In the same story, however, it is claimed that regular abductions by aliens had been taking place for several years!

Finally, I should state that there will undoubtedly be literary aspects on which also the sci-fi can be judged. A piece that is excellent in its scientific idea, has a very plausible plot may fail on the grounds of bad characterization, insufficient power of expression, etc. Likewise, a piece that does well on the literary counts may fail on the scientific aspects mentioned earlier. In such opposing scenarios, I would give greater importance to the scientific over the literary aspects. For, in the last analysis, one is judging a piece that claims to have a science-base. I would use a similar criterion for judging a historical

novel for example. It should not take too many liberties with history!

Concluding remarks

In the increasingly science-dominated world, good science fiction has an important, I would say an indispensable role to play. The gifts of science are many and not all are benign. It is the society that has to judge whether it would go for destructive nuclear bomb or a harmless nuclear reactor, for rapid communication of information or using information for curtailing personal liberty, for biological research to eliminate diseases or to create Frankenstein's monsters.

Proper appreciation of the emerging force that is science is therefore necessary. Science fiction can be a useful tool for enlightenment of the society towards this appreciation. In India this genre of writing is relatively new and so not set in grooves that the sci-fi in the West has. I do hope that our small community of science fiction writers will grow and promote good works in different languages all over our country.

I extend to you all my very best wishes.

*Inter-University Centre for Astronomy and
Astrophysics,
Ganeshkhind, Post Bag no. 4,
Pune 411 007, Maharashtra
e-mail : jvn@iucaa.ernet.in*

