daily or local newspaper without such a story, we have definitely come a long way. Science articles are no more limited to 'science pages'. For instance, climate change is not just about science. It is a combination of science, pollution, lifestyle, energy security, coastal areas, people and much more.

In early 2000s, it was very hard for a journalist to 'extract' scientific data. Data were not compiled at one source and whatever little was available, was guarded with secrecy. Things are now starting to look up. However, there still are not any ready-made science stories in India, as most research is conducted in Government-funded institutions, which are not forthcoming in sharing information. A science writer also has to be a foot soldier continuously looking out for science news, studies, discoveries and data.

For example, in 2009, a Mumbai-based research centre successfully isolated the virus strain behind the hand–foot–mouth outbreak and deciphered its etiology. Scientists found a new strain of the Coxsackievirus A6. When I requested for more information, the concerned scientist refused saying the research had to be published in an international journal first. However, I still managed to report about it. It helps to make a personal contact with the scientist and cultivate it into a life-long friendship. These 'contacts' are the lifeline of a freelancer.

Tapping freelance opportunities

Today freelance science writers have various writing opportunities to explore. Newspapers, magazines, journals, newsletters, periodicals, websites – the sky is the limit. However, the challenge for a freelancer is to be aware of such opportunities. Most publications prefer commissioning science stories to writers who have desired work experience and have reported on scientific studies in the past. Hence, budding freelance writers may face difficulty in the beginning. Networking comes to rescue under such circumstances.

Freelancers should register themselves at various listserv meant for journalists and join web groups dedicated to science writing. Such listserv/groups regularly have messages from publications/senior writers looking for freelancers. Taking up short-term internship assignments also helps. *DTE* regularly comes up with internship offers. Press Trust of India (PTI) annually recruits trainee science journalists.

Science is ever evolving. Hence, a freelancer must keep himself/herself abreast of latest scientific developments. This also helps in pitching for stories at the earliest. Since most publications have their own stable of writers, a freelancer must offer something new (with a different angle) while proposing an idea.

Payments and other challenges

Science stories require travel. Whereas most publications offer compensation (payment) against the article filed, not many reimburse travel bills. For instance, a study quantified the vulnerability of coastal zone of *Okha taluka* in Gujarat based on the projected sea-level rise scenarios of 0.5 and 1 m and warned that land area of Okha would be permanently inundated due to sea-level rise. I approached a well-known current affairs and features weekly with my story idea, which included travel to the affected villages. The idea was approved, but the magazine refused to reimburse the travel cost.

Freelancers are mostly paid on per published word basis. The rate varies between Rs 2 and Rs 5 per word. There are some publications which prefer paying a lump sum for an article. Payments usually come through only a month after the article has been published. Payment to a freelancer can never match up to the salary of a full-time journalist. However, like an employed science journalist, even a freelance science writer acts as a broker between scientists and the general public.

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Writing science for school children

Shubashree

A. S. Ganesh

Ganesh: 'Writing science for school children'. If we were to write on this topic, where would you begin?

Shubashree: Hmmm... Well, for starters, it is important to understand that children are as different as they come. They have a strong individuality and do not all fall into one group. They are unafraid to act upon their likes and dislikes, and so it is as easy to lose a reader as it is to ensure rapt attention. So, rather than imagine an audience and write for them, it is important to choose a topic that you can do justice to – you must know a fair amount of it well, you must know the logic of your article very clearly and you must be able to communicate it without complicating.

G: Fair enough. In fact, when I first set out with 'An eye for an i' – a weekly column on scientific ideas, inventors, inventions, discoveries and their impact – I wasn't exactly sure as to how it was

going to be received. So in order to gauge their interest, I let them suggest topics apart from choosing on my own. And when their responses ranged from atomic structure to black holes, brain functions to artificial intelligence, ozone depletion to what not, I braced myself for the challenge ahead.

S: Exactly! While you stand to completely lose your audience if you assume a lot of knowledge and pitch your story too high, you can be mighty embarrassed if you assume that they don't know something. This has happened to me too. Once I was standing outside my apartment and my neighbour's five-year-old son came running that side. I tried striking up a conversation with him, pointed to a set of birds sitting on a tree nearby and said, 'dekho chidiya'. The boy replied 'voh chidiya nahin babbler hai', *sotto voce*. He knew the names of many birds, having grown up in a campus where people normally went birdwatching.

G: They really do take you by surprise, don't they? So when you go about writing your articles, are there any specifics that you try to adhere to? I for one always make a list of the ideas that I want to convey, even before getting started. Also, taking into account the abundance of information at their disposal, and the varying attention spans, I keep my pieces as short as is permissible.

S: Good one! And I'm sure you will also be keeping the language straightforward; though using a big word sometimes can also engage and impress those children who love words. But to be more specific, I try to find analogies that make the telling simple even if I am talking about sophisticated concepts. For example, when I tried to explain the Western Ghats as an ecosystem, I touched upon the findings of the Western Ghats Ecology Expert Panel report of Madhav Gadgil *et al*. Though I was initially worried, it turned out to be a fascinating experience as I had to find photographs of different animals that live there and tell the story through them.

G: I can imagine! Talking about stories, I've always found it work to my advantage when I weave a story around the subject that I am talking about. Be it the urban legend about Niels Bohr and how he, as a student, answers the question of how to measure the height of a building using a barometer, how George de Mestral invented the Velcro after the burs of Burdock clung onto his clothing, or the way in which Roy J. Plunkett accidentally stumbled upon Teflon; the stories, when used as a tool, help highlight the science involved in a convenient manner.

S: I agree. While adults might get bored with them, kids do not even mind repetition and monotony, provided there is something happening. I had this experience of telling my niece a story in order to make her eat. I ransacked my brain for a story and came across this one where a man has a home with a tree in the garden. One day he comes home after walking under the hot sun and the tree asks him 'what can I do for you?' He says 'let me sit in your shade' and he sits there... Another time, after a few months pass, he says 'I am hungry' and the tree asks him 'what can I do for you?' He asks for its fruits… and so it goes on and on until the tree is reduced to a stump and even then, when the man grows old, it offers him a pedestal to sit upon and rest. The child's genuine curiosity allows to see how far one can go...

G: And it doesn't stop there. When you do it this way, you are able to bring in the human element into it, rather than isolating the science. For instance, speaking about Henry Ford enables children to understand that failures are the stepping stones to success, Lise Meitner's role in the discovery of fission serves as an example of women's scientific achievement that have gone unrecognized,... the possibilities are seemingly endless.

S: Indeed! But now that we've delved quite deep into the art of writing science for school children, don't you think you are forgetting something?

G: We've spoken about using discretion to choose the topics and we've asked them not to underestimate the children. We've mentioned the advantages of being simple and succinct, while at the same time using analogies and stories as tools to enhance the narrative and kindle their curiosity. If there is something more, I am really at a loss...

S: Well... what about why we are doing it this way?

G: Oh yes, I almost forgot! Apart from all this, we need to be bold and imaginative when it comes to the design and presentation, in order to grab the children's attention. If you feel a picture or graphic can complement your article, go ahead and use it. If a conversational style like this would help, be sure to try it out. Or if you think the entire story would do well as a comic strip, do get hold of an artist.

S: Precisely. If there is anything that you can do to communicate science to kids in a better way, do it. Make sure that you leave no stone unturned... .

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