Bureaucratic Gravity

Newton's Tree Takes Root in India

By J V NARLIKAR

IN 1666, during the year of the great plague in England, there was an exodus from towns to villages. Isaac Newton, then a young scientist in his twenties, had moved to his native house, the Woolsthorpe Manor in Woolsthorpe near Grantham in Lincolnshire. The story has it that while contemplating under an apple tree in his garden, Newton was hit by a falling apple, and the event set him wondering why an apple falls down and not sideways or up. And from these contemplations evolved the first major discovery of modern physics, the law of gravitation.

The Newton legend, which has been narrated by no less a person than Voltaire in his *Philosophie de Newton,* is traditionally recounted in school texts. There are doubts as to its authenticity, however. David Brewster, Newton's first biographer discounted it in 1831. All the same, later searches into Newtoniana revealed an account by Dr Stukely who had dined with Newton in Kensington on April 15, 1726. Stukely writes about how they "went into the garden and drank tea, under the shade of some apple trees, only he and myself... he told me, he was in the same situation, as when formerly, the notion of gravitation came to his mind. It was occasioned by the fall of an apple..."

Whatever the details, the legend must have had some basis in facts. Certainly, Newton's home did have an orchard and he must have sat under an apple tree, whether or not an apple actually fell on him. So far as the law of gravitation is concerned, although the fall of an apple may have triggered his thoughts in that direction, the credit for its genesis by Newton must go to the astronomical data on planets and the Moon. It was from Kepler's laws of planetary motion that Newton could deduce the inverse square law of gravitation.

Difficult Problem

Nevertheless, in terms of legends, the Newtonian apple takes its place alongside the apple of Adam and Eve, and the apple that led to the Trojan war.

What happened to the apple tree in Newton's garden? Its fate is well documented. Brewster saw it barely alive in 1814. It died shortly after, probably in a severe storm. The wood from it was taken to make a chair for the Woolsthorpe Library. However, its lineage continued. Graftwood from it had been taken previously and used for propagating a new tree in Lord Brownlow's garden near Belton. From this tree, graftwood was taken and propagated further. It came via the Royal Botanical Gardens at Kew to the Brogdale Horticultural Trust (BHT) in Kent, where it is available today.

I came to know of this descendant of the famous apple tree in a round about way. While lecturing at the Australia Telescope National Facility (ATNF), I showed some slides of the campus of the Inter-University Centre for Astronomy and Astrophysics (IUCAA). One slide had the statue of Isaac Newton sitting in contemplation under a banyan tree. An apple is part of the statue, lying at Newton's feet. "Newton is worried, how an apple fell off a banyan tree", I joked. A problem no doubt more difficult to solve than the law of gravitation.

After I returned to India, I received a letter from Ron Ekers, the Director of ATNF, telling me that I could ease Newton's problem by planting an apple tree behind the statue and that a genuine descendant of the original tree could be acquired. Ekers went on to give me a blow by blow account of the immense difficulty of getting the tree past the severe plant quarantine regulations of Australia. But their tree is now growing outside the Visitor centre at the Parkes radio telescope.

Helpful Officials

Inspired by the Australian example I set out on my own crusade to get the descendant of Newton's apple to IUCAA. First I started by asking if an apple tree would survive in Pune. The experts, though surprised at my desire to grow an apple tree in Pune, first shook their heads but later admitted that the tree would grow although I may not get any fruit from it. They even offered to get me plants from Shimla. However, I told them that I wanted THE tree with the illustrious ancestor.

Enquiries in Cambridge, where Newton's College, Trinity and the newly- established Newton Institute have this tree, finally led us to the BHT. The BHT officials were very helpful and offered to send us the graftwood by post. However, like the Australians, we too were to encounter hurdles of the Indian brand.

Our first attempt was in 1994. The BHT sent us a letter that they had posted the item. Registered post? No. Ordinary airmail. Enquiries at the foreign post office were fruitless. Without a receipt they could not locate anything. So we could do nothing but wait and hope.

However, as luck would have it, we were to have a distinguished visitor from England, the famous astrophysicist, Sir Fred Hoyle. Sir Fred brought two graftwood from the BHT which we planted behind Sir Isaac. Shortly thereafter the original packet also arrived by post.

However, the plants did not survive the Pune heat. So we decided to try again, this time with grafted plants which the BHT suggested, would survive better. They sent six in March 1995, again, alas, by ordinary airmail. We repeated our enquiry with the foreign post office with similar results. The post office assured us, however, that they will inform us as soon as the plants arrive. Which they did. Only their letter dated March 9 was despatched three months later and was in our hands in June! If it is any consolation to know, the post office delays its own letters too.

Fruitful Efforts

The letter told us to collect the plants after fumigating them. But what is the use, we thought, if they are already dead? Still, our horticultural consultant, ever an optimist, said, let us try and see. So we brought back the lifeless plants and planted them. And lo and behold, two of them sprouted with new leaves. Unfortunately, they too did not last the year. I do not know, whether to blame the weather or postal bureaucracy.

But the Brogdale egged us on. They agreed to send new grafted plants in the autumn of 1996 so that they have the advantage of the cool environment in the Pune winter. But now the bureaucracy caught up with the exercise well and truly. The BHT were told that before they sent any plants to India, they would need documents and certificates from us that the plants will be harmless to India. It took us several weeks of enquiries as to what documents are needed, who issues them, what guarantees are to be given and so on. The ball kept being tossed between Pune, Rahuri and Mumbai while autumn was fast approaching. Finally we were told that only Delhi can solve our problem.

At this stage I almost gave up and thought of writing to the BHT to delay sending the plants to 1997. But then I remembered a friend who was at the right place at the right time. Mr Virendar Chopra at the AGRI answered my SOS and mobilised support for completing all the formalities in time.

And so the descendent of Newton's apple tree has arrived in India and taken its rightful place behind the master scientist. So far it is doing well.