

Back to the future II

Ranganathan¹ harks back to what a great nation India was before the 19th century. Some simple calculations can give us a reality check on how dangerous the optimism behind the editorial is.

Let us first start with economics. It is tempting to argue that with the kind of economic growth India is now registering, it will soon regain its earlier glory (when together with China, it accounted for 80% of the world GDP). At present, with about 16% of the world population (demographic weight), it accounts for about 1.6% of the world GDP (economic weight). It is therefore pulling at 1/10th of the world average (think of each country as being a train being pulled by a locomotive which is under- or over-powered). When will India begin to pull just at world average, i.e. 16%

of the population accounting for 16% of world GDP?

Let us assume that for the next n years, India will grow economically at 8%, while the world economy as a whole grows at 2%. Let us also assume that demographically, India grows at exactly the same rate as the world. Then, we can find that after 40 years, India will just reach the world average. This is obtained from the simple calculation:

$$(1.6 (1 + 0.08)^n) / (100(1 + 0.02)^n) = 16/100.$$

Being average is not much to boast about. USA has 5% of the world's population, but accounts for 25% of the world GDP (pulls five times the world average.)

Let us now turn to scientometrics. It has recently become fashionable to compare India with China. The reason why these two countries fell behind economically (from 80% of the world GDP to 10% in less than two centuries) is because they neglected science and technology. Table 1 shows a recent scientometric assessment.

Let us assume that over the next m years, China does not add any more scientists to its workforce in R&D and that India adds at the rate of 4500 a year. Then, just to catch up with what China is today: 735,000 scientists to be added, at 4500 per year, it will take us 163 years.

These two simple projections give us cause for some pause to reflect upon the 'dangerous optimism' exuded in the Guest Editorial.

Table 1. Scientometric assessment

	India	China
Science funding 2002–03 (US \$ billions)	3.7	15.5
Workers in R&D	115,000	850,000
Doctorates produced per year	4500	40,000
SCI-listed publications 2002–03	19,500	50,000
Percentage share of global publications	1.9	5

1. Ranganathan, S., *Curr. Sci.*, 2006, **91**, 1123–1124.

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Nypa fruticans needs more conservation efforts

Nypa fruticans is a mangrove palm found distributed in South East Asia and Australia. It was considered to be widely distributed in the east and west coasts of India several centuries ago¹. However, presently it is found in the Sunderbans, and Andaman and Nicobar Islands along the Bay of Bengal. Although several mangrove

plants have been taken up for revegetation of mangrove forests in India and elsewhere, *N. fruticans* has not been considered either for plantation in other mangrove sites or for conservation. Hence its plantation in other mangrove formations along both the east and west coasts of India may be considered and attempted.

1. Badve, R. M. and Sakurkar, C. V., *Curr. Sci.*, 2003, **85**, 1407–1409.

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Science and faith

Most of us would agree with Karanth¹ that if a belief of any kind brings relief to a person from any kind of suffering, it is most welcome. Most of our concerns in daily life (probably more than 99%) are outside the ambit of science. They depend on some value or social attitude.

Belief (or faith), conscious or unconscious, is necessary for us in making day-to-day decisions.

However there are small areas which are scientific. They have a well-established scientific method to be used in exploring them. Everyone, specially the

students of science, should become aware of the value and importance of this method which has been so successful in recent centuries, though restricted to a small part of our lives.

More than 30 years ago (in 1973), an interdisciplinary conference was held at