the out-patient clinic as a necessity since the patient ‘expects’ some general health boosters. Even a routine supplement of vitamins and tonics in an average family of a husband and a wife, two old parents, an unmarried or widowed aunt, a younger brother and 2–3 children would take care of some 15–20% of the income of this municipal office clerk for a family of that size! Late Ramaswathy of National Institute of Nutrition used to wryly remark that if everybody had their recommended dose of green leafy vegetables, Hyderabad would not be green for the next decade! Pursuit of health is to be made sustainable and that forms an important beginning in the exposure to medicine as a profession.

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Scope for formulating quality standards of food grade silver

In the Indian subcontinent, silver foil has been used for centuries to garnish and embellish several food items, especially various types of sweets, desserts, chewable betel leaf, mouth freshening herbs and spices such as cut, sliced and sweetened areca-nut and dried dates, aniseed, green cardamom, chewing tobacco, etc. Silver foil is also used in some of the special mughlai cuisines, which at times are literally covered in silver foil. Various feasts and traditional weddings also involve serving of dishes and desserts decorated with silver foil. The culinary use of silver foils in Indian food can be judged from an estimate that the country has been converting up to 275,000 kg of pure silver into edible silver foil each year.

The Prevention of Food Adulteration (PFA) Act of India, permits the use of food grade silver leaf and requires that this shall not contain less than 99.9% of silver. The European Council allows silver on quantum satis basis and has prescribed only a minimum silver assay of 99.5%. The purity required for silver in Indian legislation and EC may mean to leave a respective margin of 1000–5000 ppm for co-metals or contaminants. This margin can easily get reduced, if a higher purity of silver is to be provided. Silver of purity grade as high as 99.999% is commercially achievable. However, purifying silver beyond the present purity requirements may not be cost effective and even 99.5% serves the purpose. It could hence be advisable to allow addition of some silver alloyable safe filler metals such as iron, tin, zinc or even copper but at the same time strictly legislate limits for toxic metals such as arsenic, cadmium, lead, mercury and the total heavy metal content which are prescribed in case of all synthetic food grade colours world over and even for aluminium powder and sheets under EC.

In a recent study1 on the quality of silver foils, appreciable residues of nickel, lead, chromium and cadmium were detected. Over half of the analysed silver foils had lower silver purity (82.5–99.8%) than the PFA of India stipulated requirement. The dimensions (length 6–11 cm, width 8–12 cm), thickness (0.21–0.46 μm) and weight (20–44 mg) also showed lot of variations. It is also desirable that only blank fresh paper sheets be used to hold foils instead of the prevalent practice of using old newspaper or printed waste papers through which there are chances of the ink ingredients getting onto the foil.

Looking at the continued use of silver foils, it appears reasonable that Food Policy/Regulatory agencies should take up the issue of silver and prepare or enlarge its quality specifications by prescribing the limits for filler and toxic metals. This step shall encourage the manufacturing units to use the desired purity raw materials so as to save unwarranted exposure of consumers to bio-cumulative toxic metals such as lead and cadmium and ensure the availability of safe and uniform quality of this food additive.


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Life sciences research in India

Nature1 carried a supplement entitled ‘Nature outlook India: Reaching for the top’. It is an unequivocal recognition of coming of age of India’s life sciences research. The editorial highlights the phenomenal growth of India’s economy, success of biotechnology companies and the growth of basic research institutes. India is truly at a critical juncture to build a scientific and technological future, it avers.

Inder Verma applauds India’s biotech and pharmaceutical companies for having undertaken novel challenges. He observes that, in the past, life sciences research in India had been constrained by funds and equipment, but not anymore. He is particularly impressed by a spate of excellent papers appearing in top-tier journals by scientists in India. He is also appreciative of the role of DBT and government’s support for science. He however laments...
the state of affairs in universities still operating in a feudalistic way and lack of interdisciplinary research. He thinks that time is ripe for the burgeoning life sciences research in India and the acid test would be the percolation of the benefits of biotechnology and modern biological sciences down to the poorest of the poor.

K. S. Jayaraman details the biotech boom of India with facts and figures to the hilt. This year the Indian biotechnology enterprises, together crossed the US$ 1 billion mark. Nobody can deny contributions of Indian biotech majors – Biocon posted revenues of US$ 150 million in the current year, Shantha Biotech with its indigenous recombinant hepatitis B vaccine almost routed the multinational giant GlaxoSmithKline (GSK) and Serum Institute is credited as being the world’s largest producer of diphtheria, pertussis and tetanus vaccines. Currently there are close to 300 companies registered under the biotech sector and achievements of some of the lesser ones are no less impressive. The setting up of The Centre for Genomic Applications (TCGA) at New Delhi’s Mathura Road with capability of three trillion operations per second by the Chatterjee Group in association with CSIR and DST is in line with the likes of Sanger Institute (UK). However the challenges, which need to be addressed are – innovation in the pharma sector in the face of the new WTO order, availability of low cost indigenously manufactured scientific equipment and appropriately trained skilled manpower.

Another article brings out the travails and tribulations of one of the biggest clinical trials in the world, for cholera and shigellosis, which are being conducted under the supervision of NICED (National Institute of Cholera and Enteric Diseases) scientists in Kolkata. India is strategically placed in terms of availability of affordable medical services and is poised to become the hub of contract research organizations (CROs) for conducting clinical trials for drugs. Although it has its own downside, expansion of infrastructure for the said purpose is going to benefit the research organizations, the technically qualified personnel and the public alike. I once asked a friend of mine, a member of faculty at IIT Delhi – ‘I wonder if career in biology would ever become an alternative to the blue-eyed discipline of engineering and medicine?’ Pat came the reply – ‘it already is!’ Though not exactly same, more or less similar sentiments have been echoed by Mariangka Sur (Massachusetts Institute of Technology), who suggests a number of measures to improve the research performance of our universities. Preferring to refrain from flogging a dead horse, I must say that lately research funding to Indian universities, especially to life sciences departments, has substantially improved.

From other chapters in the supplement, one gathers the impression that the scientific establishment in India is seized of problems faced by the scientists and all efforts are being done to clear the rough-shod. The major government agencies which are saddled with the responsibility of overseeing funding and monitoring research in India are in the process of fostering better coordination and red tape is being cut to size. Scientists may be spared from the agony of preparing 30 hard copies every time they think of submitting a research project and regulations are being enacted to encourage women scientists.

From the pages of this supplement one may also glean major activities of some of the best research institutes of our country such as their thrust areas, publication records, patents granted, faculty profiles and in the process, get inspired to emulate them. A chapter on AIDS (The coming epidemic) in the same supplement may have a sobering effect though. It seems that major efforts are underway to contain the epidemic though the odds are against us.

Satyajit Mayor’s (National Centre for Biological Sciences, Bangalore) ‘Coming Home’ epitomizes what it is to work in a state-of-the-art life sciences laboratory. After having worked for fifteen years in some of the best institutes of the ‘El Dorado of science’ he does not seem to regret, even for a minute, to have joined back home. This speaks volumes about the transformation, which our research institutions have undergone of late. After having taught long, to some of the best and not so best students, I know that there is emerging a genre of young postgraduates in science who are looking up to role models like Satyajit Mayor and the likes in other institutes. And this may prove to be the turning point in the already fired up science scenario in India.


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Need for legislative impediments to avoid mass harvesting of bryoflora

One of the main targets of the millennium is biodiversity conservation, combating desertification futhered by sound water management to ensure environmental sustainability. The Himalayan region is a reservoir of a large number of medicinal and aromatic plants. This is largely because of the diverse ecological and climatic conditions existing in the area. Although the Himalayan region occupies only 15% of the country’s geographical area, it accounts for about 30% of the endemic species in the Indian subcontinent. Bryophytes are ecologically important, diversified plant communities that differ morphologically and physiologically from vascular plants. Although bryophytes form a minor component of the total biomass of biota, they play an important role in nutrient cycling. The percentage occurrence of mosses in India is quite high when compared to any other plant group. About 27.5% of the world’s mosses and 11.26% of liverworts are present in India. Bryophytes form an important and striking part of the cool and humid Himalayan scenario. They impart a lush greenery and verdant cover in every possible shade of green tinged with a hue