the seeds to smoking on two or three days for 2 to 3 hours daily according to the class of paddy, early medium or late.' They reported that this treatment was effective in breaking the dormancy of rice seeds after a minimum resting period of 15 days. Whereas normally a period of 30 days after harvest was required for achieving 50% germination, which gradually rose to 75% in 45 days. They concluded that by breaking the dormancy of rice seeds (by smoke, reducing moisture and removal of husk), the winter rice varieties can be sown after a short period of 15 days or immediately after their harvest. Subsequently, this work[6] was also cited in relation to the role of flowering glumes of rice seeds for imparting dormancy[7] and later in the context of dormancy breaking effect of smoking the seeds[8]. But its citation in the later publications could not be done and therefore it may have remained obscure to researchers of the present time, e.g. the work of Parija *et al.*[6] is not mentioned in the historical background given in the recent review[1].

These findings clearly show that earliest demonstration of smoke as a stimulant for germination of dormant seeds was reported far back in 1940 by Indian researchers, about 50 years earlier than the report by De Lange and Boucher[5]. This work and discovery from India also assumes importance in the present era of IPR regime, where it is essential to provide credit to the pioneers and document the historical aspects of research.

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Conservation of bee trees as world heritage sites

Pollinators and pollination are crucial in the functioning of almost all terrestrial ecosystems, including those dominated by agriculture because they are in the frontline of sustainable productivity through plant reproduction. Pollinating insects are declining worldwide, resulting in pollination crisis for (food) crops as well as wild plants and loss of natural biodiversity. Possible drivers for the decline of insect pollinators include habitat loss, intensive land use, pollution including pesticides, loss of genetic diversity in honey bees, detrimental bee keeping practices and climate change. This demands a response from land managers, conservationists and political decision makers to the impending 'global pollinator crisis'. Understanding the causes of pollination failure in plants can aid in the successful conservation and recovery of rare plants, maintenance of crop yields and sustainable use of wild plant resources such as forest timber. Feasible conservation strategies involve efforts to protect or restore plant resources and native pollinators, and setting up protected natural areas, which will ensure food provision, mating and nesting sites for pollinators.

It has been estimated that, worldwide, close to 100 crops are pollinated by honey bees. The global value of animal-mediated pollination is US$ 153 billion. Animal-mediated pollination contributes to the sexual reproduction of over 90% of the approximately 250,000 species of modern angiosperms. This interaction diffusely affects human survival through its roles in sustaining much of the biodiversity on Earth and contributing to the integrity of most terrestrial ecosystems.

The plight of pollinators is causing worldwide concern. Not only are population numbers of many formerly abundant species dwindling, some species are disappearing altogether. Pollinators are a necessity for ecosystems around the globe. Pollination is not only mutually beneficial to the interacting plants and animals, but also serves humanity directly through the yield of many crops, and indirectly by contributing to the healthy functioning of unmanaged terrestrial ecosystems. Without them, the world as we know it would not exist. Despite these facts, we have allowed their populations to decline to alarmingly low levels.

It is encouraging that during the recently concluded Fourth International

Figure 1. ***a***, A view of the bee tree in Ramagovindapura Village. ***b***, Detailed view of colonies on a branch.

Insect Science Congress held in the University of Agricultural Sciences, Bangalore between 14 and 17 February 2013, experts from more than 35 countries participated. In addition to discussions on various aspects of insects and their relation with the human society, one of the interesting resolutions was to declare some of the unique bee trees in a few villages near Bangalore as world heritage sites in order to protect them. Some trees of banyan and peepal have been found to harbour more than 600 colonies of rock bee, *Apis dorsata* per tree, which is more than that reported from any part of the world. A tree located around 40 km from Bangalore city in Ramagovindapura Village deserves to be declared as a world heritage site because it reflects the importance of honey bees in agriculture, horticulture and in preserving the local environment (Figure 1). A world heritage site status would facilitate agricultural stability, enhanced fruit, vegetable production, agri-tourism and livelihood security. Such conservation efforts are required throughout the country to conserve bees for food security and stability of the environment.

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Bringing back overseas Indian scientists

In the inaugural speech of the recently concluded Indian Science Congress at Kolkata, our Prime Minister has strongly advocated to bring back overseas Indian scientists for quality improvement of our scientific institutes. He emphasized that we should bring back those outstanding scientists who want to work temporarily or permanently in the country. Actually the quality of scientific institutes depends on the quality of students we attract towards science so that they can do excellent research of global standard.

During the last 65 years, India has made considerable investments for the development of S&T. During the last 8–9 years, the government has opened 5 new IISERs, 8 new IITs, 16 new Central Universities, 10 new NITs, 6 new R&D institutes in the field of biotechnology and 5 institutes in other fields. But it will take at least a decade for India to make any difference and catch up with China, Korea and Taiwan which are racing ahead in S&T. Institutes like IIMs, IITs and IISc have their own importance in professional education, but the vast majority of the younger generation should derive benefit from higher education. There is no denying the fact that the standard of our higher educational institutes as a whole has been declining and is not up to the mark to attract and generate the quality required for the nation to become a global power in the field of education. In many of these institutes, a healthy scientific environment is totally lacking causing frustration among the younger generation. A healthy scientific environment is one which is free from prejudices, bureaucratic formalities, dishonesty, false propaganda, sycophancy, political manoeuvring, etc. 'Big science' atmosphere has gripped many Indian scientists, who think that doing research with small funds is below their dignity. It is the quality of leadership, and the level of scientific honesty and transparency that is required for a breakthrough in Indian science[1]. The castigation of scientific leadership by Bhargava[2] is a bit harsh, but needs thinking that the scientific leadership, with some exception, rewards sycophancy and punishes independence, integrity, effective communication, credibility and competence. Hierarchy is perhaps much stronger and more fossilized than necessary in many institutes. The plight of the increasing number of Ph Ds produced by Indian universities who struggle hard to find academic and research positions is a glaring example of scientific illness[3]. If we have to attract brilliant scientists from abroad, we must improve quality and standard of many scientific institutes. It is rightly pointed out[4] that in the Indian science scenario heavy 'elitism' prevails and those occupying 'managerial posts' continue short-sighted policies over successive generations.

It is hearting to note that the Planning Commission is now working on a scheme to get top Indian scientists working abroad to spend some time doing research and teaching in India (www.thehindu.com). According to the plan, such 'very high quality' scientists would be offered annual emoluments of USD 100,000 in addition to all other facilities. The main point is that it would be offered to selected scientists who have achieved a degree of international distinction in areas of scientific research that fit to our national priorities. China had succeeded in attracting 1000 of its top scientists working abroad by implementing a similar type of scheme. Further, these scientists should be free from bureaucratic formalities and political interferences. However, a word of caution is necessary – if instead of 'outstanding' internationally reputed scientists some ordinary scientists are invited giving them huge emoluments, it may cause frustration among scientists working in India. Some of the specific recommendations suggested in a recent article[5] would definitely bring excellence in education and high-quality research in India, which may enable overseas Indian scientists to work efficiently.

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