

Secret Lives: Biodiversity of the Indian Institute of Science Campus. Natasha Mhatre. Indian Institute of Science Press, Bangalore. 2008. 229 pp. Price: not mentioned.

Even the most urbanized of landscapes have provided opportunities for valuable biodiversity to persist. Patches of natural habitat wherein such biodiversity persists are unfortunately squeezed from all sides that they survive precariously in the form of islands. Islands of biodiversity that range from tiny household gardens to sprawling institutional and privately managed campuses characterize most Indian cities. The latter are of particular interest to nature conservationists as many are old and undoubtedly storehouses of ecological history and biodiversity relics. Numerous examples can be cited of organisms, unexpectedly encountered and observed within urban campuses, that have proved to be new to science, evidence of extended geographical ranges and cases of rediscovery of a presumed extinct species.

At a time when urban planners are being sensitized about the need to preserve and restore islands of biodiversity what is definitely lacking in most cities is authentic, simple-to-understand information on living organisms and their ecology. It is heartening that academic institutions established on campuses that are amongst the last storehouses of native Indian biodiversity, have taken the lead in preparing user-friendly guides to living organisms. The Indian Institute of Technology, Madras is certainly a forerunner in publishing simple, low-priced, illustrated biodiversity guides to the campus. Two books published in 2008 as a part of the Golden Jubilee series of publications together illustrate and describe 400 species of plants and animals. Care Earth prepared the two books after systematically documenting the biodiversity of the campus starting 2006.

The city of Bengaluru (Bangalore as I know it) known for its exotic gardens has also been in the forefront in nurturing amateur and professional naturalists. Bengaluru's cult of bird and tree watching is well known and the campus of the Indian Institute of Science has traditionally been the most popular naturalists' destination. During the past 30 years, the campus has had numerous naturalists, including the late Salim Ali, cherishing its rich biodiversity. I recall the nine years spent on the campus (1983–92) when the Centre for Theoretical Studies (CTS) and the Centre for Ecological Sciences (CES), came up with ingenious ways and means of sensitizing the faculty, students and visitors of the Indian Institute of Science to its biodiversity. The weekly calendar of events brought out by CTS carried a 'Bird of the Week' depicting a common bird with a simple sketch and a brief description. There were also efforts to sensitize residents and visitors to the flora of the campus. Major roads and lanes were named after trees. Roadside trees that attracted immediate attention soon carried names on them. A small vacant space opposite CES was planted with plants (mostly trees and lianas) from the rainforests of the Western Ghats that came to be known as the CES mini-forest! An illustrated guide to birds titled *Of Feathers and Colours* authored by me was published in 1992 in association with the Interline Publishers.

Secret Lives is an outcome of the years of biodiversity sensitization that the Indian Institute of Science has passionately nurtured. Needless to state that I feel elated that a student of CES has come out with this fascinating publication. I have seen many excellent 'table-top' books on biodiversity from various parts of the world. Nevertheless, this one is special. Few good nature photographers have had the capacity to write. This is not an over-statement as I have attempted to help (and failed) a handful of wildlife photographers who have an array of well-executed photographs sitting on them unable to put them together in the form of a popular book.

If I may make a few remarks on the structure and contents of the book, these are what I might say. Whereas I entirely agree with the author in saying long lists of species mean different things to different people, and that they have been avoided, I feel there are a few gaps that

could have been easily filled had the text been reviewed and edited with a broader understanding of the ecology of the campus. First of all, the species that have been portrayed have evidently been selected based on the quality of the photograph without paying due attention to their ecological significance. Example, anyone who steps into the Campus during the day is welcomed by the calls of the White-cheeked Barbet, which in my opinion is also amongst the most numerous of birds here. This bird is missing in the book. Then, there are no lizards!

My second comment is about the way the book is organized. It is interesting that the author chose to arrange the plates and text in way that they start with habitats, discuss biology and then ecology and conservation. What however does not emerge in the book is the fact that much of the campus is human-modified sustaining a biodiversity dominated by organisms that are non-native and potentially invasive. It is known that when the original rock and scrub vegetation of the campus was converted into a cozy woodlot, species of birds like the Laughing Dove disappeared. The flamboyant Rock Lizard and the elusive Slender Loris have nevertheless persisted. The Giant African Snail is an invasive alien species and a worldwide threat to terrestrial plants and animals. The Five-striped Palm Squirrel (if the animal in the photograph on page 199 is really that) is also proving invasive. A brief section highlighting the biodiversity transformation that the campus has experienced in the last 30–40 years would have further enhanced the quality of the book.

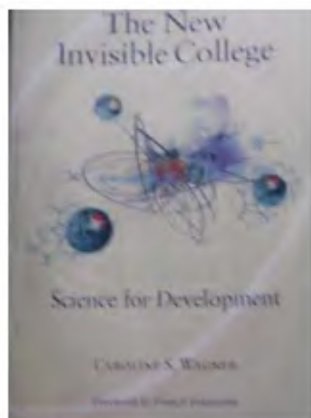
My third and last comment is that the book does not really address the biodiversity of the campus. Biodiversity implies magnitude and organization. It would have helped if the author had provided a summary of the number of species (species richness) amongst better-studied classes of organisms. While there is remark on the 90 species of ants found, there is virtually nothing on other animals or plants. How many birds have been reported till date? How many mammals are known? What about the diversity of butterflies? How many species of plants on the campus are non-native? These are questions that naturally cross the minds of readers of the book.

My remarks notwithstanding, the book is a fabulous one. The photographs are superb. I greatly appreciate the talent and

dedication behind the work. I must also congratulate the Indian Institute of Science and those behind the actual production of the book for the high quality of the product. If it is a priced publication, the publishers should evolve a better marketing strategy so that the book receives wider publicity. Just as the copy that I have reviewed has become a valuable addition to Care Earth's library, many would like to possess one.

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The New Invisible College: Science for Development. Caroline S. Wagner. The Brookings Institution, 1775, Massachusetts Avenue NW, Washington DC 20036, 2008. 157 pp. Price not mentioned.

The central thesis/argument the book makes is that 'Science operates at the global level as a Network – an Invisible College'. This, the author visualizes is fundamentally changing the structure of science in the 21st century. The rise of networked science makes knowledge creation more efficient and creates opportunities for developing countries to participate in global scientific activity and tap resources to solve local problems. But the author cautions that in order to take advantage of the networked structure, countries need to design new science policy framework that moves beyond national orientation. In advancing these arguments, the author uses both qualitative and quantitative perspectives.

Francis Fukuyama's foreword provides a perfect setting for this book. He succinctly provides a glimpse of the changing landscape of science and articulates why this book is important. The book has three parts. Part I covers three themes: The emergence of the new invisible college (Chapter 1); The topology of science in the 21st century (Chapter 2); Network character of science (Chapter 3). Part II makes an analytical introspection of the network dynamics. Three themes cover this section. Tectonic shifts: The rise of global networks (Chapter 4); The virtual geography of knowledge (Chapter 5); Scientific capacity and infrastructure (Chapter 6). Part III dwells upon how the emerging configuration requires innovative policy framework and governance. These aspects are covered under the title 'Governing the new invisible college' (Chapter 7). Appendix explains the construction of the index used by the author to assess scientific capacity. For scholars, the Notes section in the end is a rich source of reference material.

To advance the different arguments, the author brings in concepts that span a wide disciplinary matrix; borrowing extensively from network theory and innovation studies. For a lay reader the concepts are introduced in a manner that can be easily assimilated. For example, the author uses the language of network theory to visualize the structure of invisible college (Chapter 3, Networked science). Using this world view, the author argues that invisible college is a complex adaptive open emergent system (p. 35). But to provide readers a deeper insight into the meaning of each of the concepts, she uses the metaphor of a forest. Later when other network concepts are introduced such as scale free network, power law that are common language in network theory but are esoteric concepts for others (p. 39); the author moves beyond the metaphor of forest to explain mathematical underpinning behind these concepts. This innovative style makes the arguments more compelling.

The book also provides glimpse, evolution and functioning of scientific activity across the world through empirical and qualitative investigations. Concepts such as preferential attachments (that defines collaborations), weak links, lock-in, path dependency, cumulative advantage are used to construct the story. As

interactions (among different fields) grow more complex and become institutionalized, a new area/subfield emerges. Even though the activity within the invisible college is largely self-directed, it is not random. It follows identifiable patterns and rules. Social capital (shared ethical values, mutual trust) is instrumental in emergence and fruition of collaborations; it motivates scientists to self-organize into teams and share resources to solve scientific problems.

Wagner advocates some key issues for developing countries to participate in global science. Each nation including advanced countries has to enter the global system as participants so that valuable information (reciprocity) or/and resources (complementarity) can be exchanged. Developing countries need to identify and exploit unique local conditions; require to link to larger world community but not at the expense of local connections. The new emerging structure of science requires new governance of science that can facilitate knowledge creation and problem solving by involving experts from different countries and diverse disciplinary backgrounds. Developed and developing countries should re-design their science policy framework that can accommodate the new structure that views science and technology as an emergent networked system that can facilitate global scientific exchanges rather than being directed only towards strengthening national assets. Science policy should take into account the different levels at which scientific network operate, align incentives to increase opportunities for local participation and democratize decision making about scientific investments and resource allocation.

Although the author's views are compelling, there are other dimensions that cannot be ignored. The book does not take into account the changing contours of knowledge production. Increasingly it is being observed that the locus of knowledge production is becoming enlarged with firms and other actors apart from universities actively participating in this process. This is more so with the advent of science-based technologies. There is reference to new modes of knowledge production, interactions among different actors ('triple helix'), but these are not expounded further.

Science is going through new tensions. A substantial portion of public science is becoming private knowledge. Firms treat