

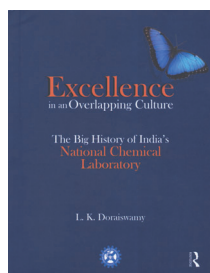
could even be made in a laboratory could now be accused of “playing God”, because now the question of the creation of humans (exclusively the domain of divine planning and the forces of Creation) is affected.

It should also be noted that the first scientific ideas about the creation of new life-forms were born in Germany in the second half of the 19th century, at a time when, as organic chemistry was beginning to develop, attempts were made to disprove, by means of organic syntheses, the idea of a “vital force” (*vis vitalis*). At the beginning of the 20th century, Emil Fischer formulated the program of “chemical synthetic biology”, in the spirit of the ideal of progress from pure imitation of nature to the domination of nature, with the ultimate goal of the chemical synthesis of life. Since then, many reports about the “creation of synthetic life” followed at regular intervals, most of them now forgotten.

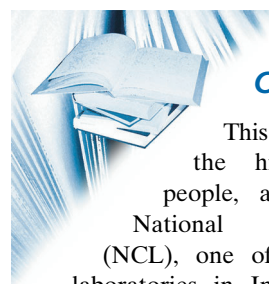
Each of the 16 chapters in the book can be read independently, and is a journey through a multitude of facts that, separately, are already familiar to each of us. However, most of us never thought of them from a broader historical and cultural perspective. For example, Chapters 7 and 8 present an excellent analysis of the media coverage of “life creation” during the last hundred years or so. They describe a time-line that extends from the report on the “chemical synthesis of life” by the German-American parthenogenesis researcher Loeb in the 19th century, via Danielli’s experiment of 1970, in which patchwork amoeba were reported as “the first synthesis of a living cell”, up to the recent experiments by Craig Venter on “artificial cells”. Developments such as the revival of the theory of rigid genetic determinism, and the attempts to emancipate SB from molecular biology, biochemistry, and genetics by emphasizing “synthesis of life” as a foremost research goal, are all brilliantly described.

This excellently written book is highly recommended for everyone who wants to understand the main protagonists, driving forces, mechanisms, and the cultural and social background of “high-impact” modern science.

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**Excellence in an Overlapping Culture**  
The Big History of India's National Chemical Laboratory. By L. K. Doraiswamy. Routledge (Taylor & Francis), New Delhi, 2010. 625 pp., hardcover.—ISBN 978-8189643003



### Excellence in an Overlapping Culture

This book is largely about the history, the work, the people, and the culture of the National Chemical Laboratory (NCL), one of the over 200 national laboratories in India that operate within the framework of some 15 scientific agencies or departments of the Government of India, most of which were set up after Indian Independence in 1947.

NCL is one of India’s finest research laboratories, and has made significant contributions, both in basic research and applied sciences, and the author, L. K. Doraiswamy, has been one of India’s foremost chemical engineers, but the book does not measure up to these standards.

The first part, of nearly 90 pages, describes mostly the history of Indian science and then the history of the Council of Scientific & Industrial Research (CSIR) of which NCL is a constituent. This part of the book is eminently readable, but it would have been more relevant if the book was about all of Indian science after Independence.

The rest of the book comprises three types of contents: firstly, content of interest to everyone; secondly, content of interest to those directly concerned with NCL, such as the description of projects that failed, in Part IV of the book; and thirdly, content that consists of items too trivial to be of interest except to a very few, if any, readers. The second and third types dominate the book. The attempt to include “everything” often obscures the elements of uniqueness for which the laboratory is justifiably known, such as catalysis, bamboo tissue culture, and Damodaran’s discovery of one of the 20 constituent amino acids of proteins. Part IV of the book, about NCL’s contribution to industry, is perhaps the most valuable, although even this could have been shortened. Chapter XVI, which reviews the culture and the environment that has prevailed in the NCL over the last six decades, makes very interesting reading.

An example of “contamination” of the exceptional with the mundane is the section on chemical biology (pp. 298–301), where about equal space is given to the excellent work on peptide nucleic acids and to the setting up and use of an automated DNA synthesizer and the PCR machine, which should not even have been mentioned. Much of what is in Chapters XIV and XV, such as the description of the guest house, the hostel, the medical centre, recreation facilities, and the shopping centre—facilities that are by no means unique—would be of no interest to a general reader. Then in Chapter XVI there is a repetition of Ratnasami’s work on a

catalyst for a major petrochemical project, which has already been described earlier on page 394.

Chapter XVII, containing the profiles of various directors that are provided by their relatives (for example, that of the author by his son and daughter), is trite in my opinion. In fact, in an attempt to leave nothing out, at times the descriptions are very sketchy. An example is the reference to the Bhopal gas tragedy on page 457. The results and the consequences of what NCL did in regard to this disaster are not given. As one who has been intimately connected with what happened after the tragedy, I can say with confidence that the contribution of CSIR was insignificant.

In a book of more than 600 pages about a single institution, one would expect to find mentions of not only the accomplishments and good points of the organization and individuals concerned with it but also the failures. For example, S. Varadarajan, who is described in the book as “the ever busy and fully committed Director-General (DG) of CSIR, who took a personal interest in the most important event of his time, the Bhopal accident”, was the only DG of CSIR who was transferred by the Government of India before finishing his term. There is also a lack of comparisons with other outstanding institutions in the country—for example, in the area of chemistry, with the Indian Institute of Science at Bangalore, or with the Indian Institute of Chemical Technology at Hyderabad, or in the area of biological sciences with the Indian Institute of Chemical Biology at Calcutta, the National Institute of Immunology at Delhi, the National Centre for Biological Sciences at Bangalore, or the Centre for Cellular and Molecular Biology at Hyderabad. In fact, there are several institutions in India that fulfill all the criteria of excellence such as those mentioned on pages 154–174, in some cases to a greater extent than NCL—although there is no question that in certain areas, such as catalysis, NCL absolutely stands out.

There are also many errors of fact and wrongly spelled names. For example, on page 95 describing

India’s science and technology system, there is no mention of the Indian Council of Medical Research, the Indian Council of Agricultural Research, the Department of Science and Technology, the Department of Environment, and so on. The Department of Scientific and Industrial Research is mentioned twice on page 96. Many constituent units of the Department of Atomic Energy, such as the Atomic Minerals Division, are not mentioned.

Page 234 gives the numbers of papers published by the CSIR laboratories; this comparison has little meaning unless one indicates the number of scientists engaged in research in each laboratory. On page 140 it is mentioned that the Guha Research Conference (GRC) has met in Khandala every year. GRC met in Khandala only for its first meeting, and not in any of the subsequent nearly 50 meetings.

Pages 335–336 show that, out of the over 10000 papers that NCL has published in its history as recorded in the book, only 16 papers have received more than 100 citations, which probably includes self citations; two of them seem to be papers by the author himself, after he left NCL. There are laboratories in India where the percentage of papers receiving more than 100 citations is very much higher. With regard to patents, while the number over the recent years is impressive, the book does not mention how many of them have actually been commercialized.

Finally, there is no consistency in the book in regard to the use of first person or third person when referring to the author. To get the most out of the book one would need to look for diamonds in a pile of sand, but the diamonds would be worth finding.

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