energy higher than this cut-off, could be an indication of the failure of the special theory of relativity, as suggested by Coleman and Glashow. In any case, if any of these possibilities is realized we would have evidence of physics which would be beyond the string theory.

The special theory of relativity reduces to Galilean relativity when velocities involved are much smaller than the velocity of light. Is it possible to extend the special theory of relativity further so that the extended version, now named double-special-relativity (DSR), is consistent with the concept of a maximum energy (or a minimum length of the order of Planck length). A surprising discovery is the existence of DSR, which has been found in two versions. Effectively, it amounts to a faster speed of light for the early universe. This was first suggested by Magueijo as a possible explanation for supernova observations, which are normally understood in terms of mysterious dark energy.

One of strongest attractions of the string theory is its claim to provide a finite theory of quantum gravity. The proof of finiteness by Mandelstam is incomplete, but is believed to be fixable by the string community. Those outside the committed group, like Smolin, are not convinced. Is there any other promising approach to quantizing gravity? The only serious contender for this is the loop quantum gravity approach of Ashtekar and others.

The second problem in Smolin's list are the difficulties with foundations of quantum theory. There is lot of activity here, but no definitive progress. Maybe one needs a modification of the present-day formalism of quantum mechanics. It could be that all the problems will fall in line together with this modification only.

The last part of the book is devoted to sociological and other comments on the theoretical physics community. Smolin is quite disturbed that so much of talent and support has been invested in string theory. He would like to see a different scenario in which young physicists pursue other approaches seriously, especially in view of the lack of success in the string theory approach. He feels that at present because of career reasons and other sociological reasons it is not so; and this is rather troubling for the discipline of theoretical physics. There is some truth in what Smolin has emphasized here. Of course, brilliant young physicists should and will decide the direction of their research, depending on which approach they think would lead to success in solving the fundamental problems in theoretical physics. So far, most of them have opted for string theory. Maybe now after reading the reasoned advocacy of other approaches by him, Smolin can hope that some of them will follow the newer alternative approaches.

Smolin has written an account of developments in fundamental theoretical physics, which I found to be full of wonderful insights and also a balanced one. That it is written well is a bonus. He also gives string theory its due. The whole tone of the discussion is rather reasonable and not unduly polemical. I recommend the book to all those who would like to have a critical assessment of present-day fundamental physics.

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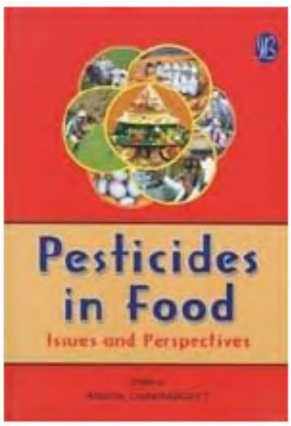

Pesticides in Food: Issues and Perspectives. Amrita Chakraborty (ed.). The Icfai University Press, 52 Nagarjuna Hills, Punjagatta, Hyderabad 500 082. 2007. 250 pp. Price: US$ 18.

The book has three sections with eight chapters along with an overview and an index. It basically looks at the issues and perspectives regarding pesticides in food, with a focus on lesser pesticide usage, analysis and reacting awareness. It also deals with the long-term inputs that the policy makers and farmers/growers have to put in, such that the use of pesticide decreases and ecological methods can be applied for better farming practices.

In general, the book begins with elaborating the use of pesticides being more profuse thus contaminating the system and demands for the use of non-chemical vis-à-vis chemical methods to combat pests in foods, especially in the food-grains. The book contains certain acronyms such as GPU (good pesticide use). If the agenda is that of no pesticides, where is the question of GPU? I think what is most important is good agricultural practices.

The use of pesticides, herbicides and fungicides in several countries in South East Asia and in other countries is not crop-wise but pest-wise. However, a generic use of it which is contaminating the whole water system and an excess use of these chemicals is the question. In today's situation, the classification of pesticides requires a chemical approach, rather than just classification into fumigants, herbicides, etc.

It is important that good standards be used for the analysis of pesticides. This is not brought out clearly in the book in terms of validation, cross-validation, accreditation, ISO 9001, ISO 14001 and other GLPs (good laboratory practices) that need to be a part of the entire validation system of analysis across the globe as one single method. Otherwise, under the WTO regime, we will be subjected to several rejections and acceptances, which can create safety problems.

The limit set for pesticides as indicated by the author is one that already exists, but it has a background which many may not be aware. The EU has set 0.1 ppb of contamination of pesticides as surrogate to zero! It is not that in every analytical method we can determine this limit, because it is dependent upon the matrix, the mix of pesticides, the interfering materials and the stability of the pesticide in a particular food ingredient. However, it is best that there are no pesticides in food and we must work towards that rather than looking only at the precision of analysis. Good agricultural practices and good food chain practices make a difference in reducing the level, as highlighted in the book. Chapters 5 and 6 address food safety and also crops with a focus on organic farming, which is mentioned from the point of view of the global situation.

Chapters 7 and 8 look at future action and farming practices. The database men-

tioned in the book is vital today for India. I think this must be taken up seriously so that one can have a clear picture of protecting the future using the present data to make sure that we live in a healthy world tomorrow.

The book is a good introduction for those who do not know much about pesticides.

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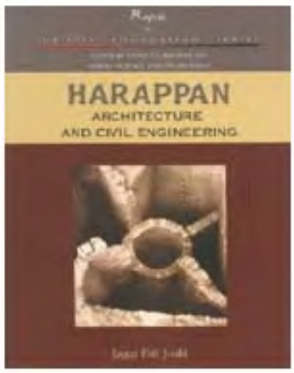

Harappan Architecture and Civil Engineering. J. P. Joshi. Rupa & Co, 7/16 Ansari Road, Daryaganj, New Delhi 110 002. 2008. Price not mentioned. 218 pp.

Discovery of the ancient cities Harappa and Mohenjodaro followed by Kalibangan, Dholavira, Lothal and several other settlements, big and small, opened up a new chapter in the history of Indian Civilization. The story is still unfolding with the future of India's past still hidden below the ground. Nevertheless, what is already known about the Harappan, also known as the Indus Valley Civilization (IVC) or Sarasvati–Sindhu Civilization is amazing. The IVC was essentially an urban phenomenon, spread over some one million square kilometres, between rivers Indus and Sarasvati (Gaggar-Hakra), reaching present-day Kashmir, Uttar Pradesh and Maharashtra. Archaeologists recognize three temporal phases of the IVC, known as pre-Harappan, mature Harappan and the decadent stages, covering roughly the period 3500–1500 BCE. But, who were these people, what were their beliefs, religion, language and script? These are yet to be figured out. However, the material evidence unearthed about their cities and infrastructure facilities is fascinating.

The most remarkable feature of the IVC was its skill in town planning, including water supply and sanitation facilities to its citizens. The drawings of the excavations show considerable forethought and deliberate planning in the founding of the IVC cities. They were unlike some of our present-day cities that have grown by simply absorbing nearby villages, without advanced planning. The boundaries of the IVC cities were well marked with fortifications. Long main roads paved with burnt bricks were neatly intersected by smaller streets at right angles. The streets of Mohenjodaro divided the city into square or rectangular blocks. Every block had residential houses with narrow lanes, each lane having a public well, sometimes with chutes for carrying water into a storage tank. It has been estimated that Mohenjodaro had 700 wells, approximately one in every third house. Waste water from the houses flowed into a covered public drain in the street, which in turn led to larger drains – horizontal and vertical – with inspection chambers and soak pits. The elaborate drainage system, roads, fire pits, kilns, residential, industrial and storage buildings can be recognized among the ruins even now. The architecture appears to be functional rather than what may be called elaborate or decorative. However, the flooring tiles found in Kalibangan are ornate and look sophisticated in the geometric patterns etched on them. No monumental or religious buildings have been unearthed or identified so far. This is not to say there were no big structures. The Citadels, the Great Bath in Mohenjodaro, the granary at Harappa and the retaining wall at Dholavira are remarkable for their size. There are some special structures, such as the eighteen circular brick platforms at Harappa, the purpose of which has not yet been deciphered. Dholavira was founded between two rivers on Khadir Island surrounded by a sea in the present-day Rann of Kutch. Water was stored in a rock-cut artificial lake. In addition, they had several storage wells to harvest rain water. Water inlet works were fashioned by erecting check dams on the seasonal rivers, the remains of which exist even after 5000 years. The dock yard at Lothal could be considered a marvel of ancient engineering. Jansen (*World Archaeol.*, 1989, **21**, 2) analysed the water supply and sewage disposal systems of the Harappans to conclude: '... the inner-urban water supply and effluent disposal systems stand out as major achievements of the mature Harappans. Here, for the first time in the history of mankind, such waterworks were developed to a perfection which was to remain unsurpassed until the coming of the Romans and the flowering of civil engineering and architecture in classical antiquity, more than 2000 years later'.

This pre-Iron Age society was prosperous, as can be inferred from the size of the cities, skill in non-ferrous metallurgy and great care in water management. The surplus economy was sustained on agriculture and external trade until due to unknown reasons, it collapsed leading to the end of the urban phase of the IVC. Wright *et al.*, in their analysis of water supply in the Harappan region (*Antiquity*, 2008), found that the waters of the rivers in the upper Indus in the Harappan region increased around 3500 BCE, implying flooding and replenishment of soil for agriculture. But this decreased around 2100 BCE. Reasons as diverse as earthquakes, floods, extraterrestrial impacts, change in topography and climate change have been adduced for the collapse of the IVC.

The level of civic sense exhibited by the city planners, builders and dwellers highlights the civil engineering knowledge and practice that the IVC possessed during its peak period. The book under review captures the status of civil engineering of the IVC mainly through photographs, drawings and sketches. However, to understand and appreciate the motivation, methods and systems evolved by the IVC, one has to go beyond photographs of the excavations into the analysis of the exposed data. This is conspicuously missing in the book.

The book is written in ten chapters. The first four chapters describe the excavations with a view to provide the background for what is to come in the remaining chapters on engineering. There is a wealth of information presented to differing standards with many repetitions. The unexplained archaeological jargon is sure to put-off many interested in the subject. For example, under the subhead 'nomenclature' (p. 8) the phrases, 'pre-defence phase', 'cemetery R-37' and 'cemetery-H' are taken for granted as understood. The list of undefined technical words is