competition, Bell Labs was a goner. I remember Arno Penzias, then President of the Bell Labs, saying that the entire budget of the place was 500 million, whereas a TV ad (during the Super Bowl – a top sporting event in the US) to show that AT&T was better than its competitor MCI cost 1 billion. What irony that the cost of making innovative products was so much less than the cost of selling it. But that is the reality of a competitive marketplace, which ultimately benefits the consumer and forces one to run a tight ship. To give a personal example, the cost of making a phone call from the US to India – when AT&T was a monopoly – was US$ 2.50/min. Overnight, the cost dropped to $0.60/min, when MCI entered the market. Obviously, there was no change in the infrastructure, no new cables were laid. The clear inference is that AT&T was overcharging by a factor of four!

The book is a must-read for all administrators of science research, plus anyone interested in the history of science in the last century. The author correctly points out that the environment for the success of Bell Labs – monopolistic pricing for telecommunication, the need to connect people over long distances, the need for low-cost electronic switches, and so on – will never happen again. But there is a current worldwide need in terms of renewable sources of energy. And it requires the ingenuity of the best scientists and engineers to solve. Unfortunately, private businesses do not have the time and resources for this. But governments do. They alone can look ahead and invest in big but risky breakthroughs. It behooves them to set up Bell Labs-like places to solve the energy crisis.

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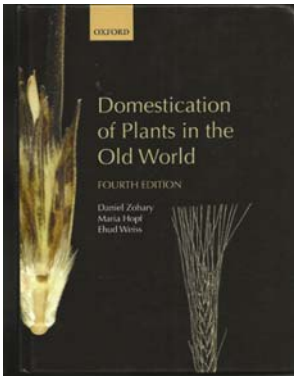

Domestication of Plants in the Old World. D. Zohary, M. Hopf and E. Weiss. Oxford University Press, Oxford, UK. 2012, 4th edn. xvi + 243 pp. Hardbound. Price: BP 55.00.

This is the fourth edition of a book published initially in 1988. It was then written jointly by Daniel Zohary (The Hebrew University, Jerusalem, Israel) and Maria Hopf (Roman-German Central Museum, Mainz, Germany). They published the first three editions jointly, and after Hopf passed away, the present edition has been co-authored by Ehud Weiss (Institute of Archaeology, Bar-Illan University, Ramat-Gan, Israel).

This book has been a required/recommended reading text in courses on agriculture, evolution and archaeology in some universities in Europe and North America, after it was first published 25 years ago. The authors have attempted to retain almost the same length and form in all the editions.

The book, according to the publishers, 'reviews and synthesizes the information on the origins and domestication of cultivated plants in the Old World, and subsequently, the spread of cultivation from south-west Asia into Asia, Europe, and north Africa from the very earliest beginnings'. The present edition also 'incorporates the most recent findings from molecular biology about the genetic relations between domesticated plants and their wild ancestors'.

The book contains 10 chapters, three appendices (maps, chronological chart of different regions and archaeological sites), and ca. 1100 references. The first chapter, 'Current state of the art', gives an overview of the work covered in the book. Chapters 3–9 summarize the work on cereals (ca. 10 nos), pulses (10 nos), oil and fibre-producing crops (ca. 7 nos), fruit trees and nuts (ca. 20 nos), vegetables and tubers (14 nos), condiments (5 nos) and dye crops (5 nos). Chapter 2 outlines briefly the sources of evidence used to determine the origins of crop plants. The last chapter (no. 10) lists the plant remains obtained from mostly the European Mediterranean countries.

The title of the book is a synecdoche. The book covers mostly only the crops of the region that the authors term as the 'classical Old World'. This region comprises Southwest Asia, the Mediterranean basin, and temperate Europe. This limited geographical coverage might have been in order 25 years ago when the book was first published. Most of the other regions were relatively unknown or little known archaeologically, and the science of archaeology was under the domineering influence of the work and writings of V. Gordon Childe (1892–1957), a pioneer in Neolithic agriculture and European prehistory. Since then, different regions of the Old Word, such as Africa, and South, Southeast, and East Asia, including New Guinea, have seen numerous excavations and studies. They have thrown much light on the prehistory of these regions, including cultivated plants archaeology (e.g. Allchin, F. R., *The Archaeology of Early Historic South Asia*, Cambridge University Press, 1995; Chang, K. C., *The Archaeology of Ancient China*, Yale University Press, 1986; Higham, F. W., *Encyclopaedia of Ancient Asian Civilizations*, Facts on File, 2004; Glover, I. and Bellwood, P., *Southeast Asia*, Routledge, 2004; Phillipson, D. W., *African Archaeology*, Cambridge University Press, 2005 and so on).

The book deals in detail with 'the crops of early Neolithic agriculture in southwest Asia', viz. the three cereals, emmer wheat (*Triticum turgidum* subsp. *dicoccum*), einkorn wheat (*T. monococcum* subsp. *monococcum*) and barley (*Hordeum vulgare*), and a few grain legumes that appear as 'constant companions' of the above cereals. These are lentil (*Lens culinaris*), pea (*Pisum sativum*), bitter vetch (*Vicia ervilia*) and chickpea (*Cicer arietinum*). Flax (*Linum usitassimum*) is also described as another 'founder crop' of the region. The authors are however less definite about the status of three other very early crops of the region, viz. grass pea (*Lathyrus sativus*), rye (*Secale cereal*e) and faba bean (*Vicia faba*). They too have been covered to some extent.

In the classical Old World, the first definitive signs of domesticated plants

'appear in a string of Early Pre-Pottery Neolithic B (PPNB) farming villages' that had developed by ca. 10,500–10,100 cal BP (calibrated years before present). Then, clear indications of lentil domestication appeared at about 10,100–9700 cal BP; and of pea, chickpea, and bitter vetch at ca. 9900–9500 cal BP. Altogether, there are 11 sites in Jordan, Israel, Iraq, Iran (southwest), Syria, Cyprus and Turkey that have harboured the oldest plant remains. The authors observe that a feature of the early farming PPNB villages (the 'core area') has been that generally all of them revealed a combination of cereals, pulses and flax, and 'almost at the same time, signs of herding also appear'.

Conducting excavations in Southwest Asia has had certain intrinsic advantages that most other regions of the world did not have. The hot and arid prevailing climate of the Middle East is conducive for the fine and intact preservation of specimens of even the high moisture-containing materials like fruits and vegetables. Further, this region had the benefit of archaeologists from almost throughout the Western world conducting field excavations right from the beginning of the twentieth century, and especially after the Second World War. Compare this with the situation in the monsoon Asia, for instance, with its high rainfall, thick vegetation, generally high population density, and most importantly, the significant sea-level rise and the consequent disappearance of Sunda and Sahel, and sea-level rise (50 m or more) of the heavily populated coastal regions of monsoon Asia, which resulted in the obliteration of all the pre-existing artefacts and preserved biological materials.

This advantage is fully reflected in determining the progression towards domestication of the temperate cereals, wheat, barley and oats. The most significant single step in the progression from their putative wild ancestors to the modern-day cultivated forms has been in the change from the rough disarticulation of the intermode to nonshattering mutants. This character is controlled by 'recessive mutation in a single gene or by two such mutations' (sic). This point has since been explained that only when the abscission scar in well preserved, (that) it can be used as a diagnostic tool. The authors then go on to state that increase in grain size during domestication is a less reliable diagnostic trait. They have not given any possible explanation for this.

While the seven temperate southwest Asian cereals are discussed in fair detail, the two millets (*Panicum miliaceum* and *Setaria italica*), sorghum and rice also included in the chapter on cereals, have received only minimal attention. All these crops have originated and diversified outside the authors' traditional Old World (Southwest Asia, the Mediterranean basin and Europe). The African rice, *Oryza glaberrima* is not mentioned even once in the text. Further, the authors have relied upon only select references to cover these crops. This has resulted in presenting an uneven picture on the origin of these cereals. The coverage of plants belonging to the other crop groups – oil and fibre-producing crops, fruit trees and nuts, vegetables and tubers, condiments and dye crops – which have originated outside the 'classical Old World' of the authors is also sketchy. Also, the treatments of all the crop plants are centred primarily on archaeological evidences obtained chiefly from the classical Old World. The wild ancestry of all the crop plants, molecular biology, and species and phylogenetic relationship aspects are included only nominally.

There is no mention at all in the book of several major crops of the Old World such as coconut, mango, banana, sugarcane, aroids, yams, tea, coffee, the various staple food crops of Oceania such as sweet potato and bread fruit, several vegetable crops, pulses (black gram, green gram, pigeon pea, cowpea, for instance), major fibre crops (jute), spices (black pepper, ginger, cinnamon, cardamom, etc.). Hence, in the present context, when no information is given on so many of the Old World crops, the reasonable thing to do may be to modify the title of the book to better reflect its present contents. As said before, the title is now a synecdoche.

The language used in the text suffers from several infirmities – in grammar, syntax, inaccurate and/or inappropriate use of words and spelling, printing and/or factual errors. The presentation of archaeological information is also replete with errors. These errors are too numerous to list. Surprisingly, even the chromosome numbers and ploidy of 2–3 species each are given incorrectly, e.g. *Asparagus* (p. 161) should be $2n : 20$; *Brassica juncea* (p. 112) should be $2n : 36$, not 2; rice is $2n = 2x$, *B. juncea* is $2n = 4x$, and so on.

It is difficult to accept that one of the foremost academic publishing houses, the Oxford University Press, could clear the publication of a volume without adequate editorial attention.

Notwithstanding the above observations, the volume is a good source of information on the archaeology of the crops of the Near East.

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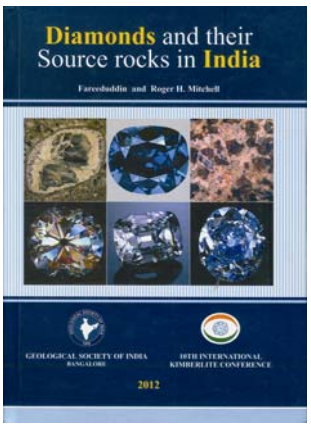

Diamonds and their Source Rocks in India. Fareeduddin and Roger H. Mitchell. Geological Society of India, P.B. 1922, Gavipuram P.O., Bangalore 560 019. 2012. 434 pp. Price: Rs 2500 (US$ 25).

India introduced diamond(s) to the world for the first time. The country remained as the sole producer of diamonds for nearly 2000 years and enjoyed an unparalleled monopoly till the 19th and 20th centuries when diamonds were eventually discovered in Brazil and subsequently in South Africa. The first reference to diamond as a gem can be traced back to Kautilya's *Artha Sastra* (320–290 BC) and subsequently to Kalidasa's *Raghu Vamsha* (5th century AD) and Varahamihira's *Brihat Samhita* (6th century AD). The glory of the Indian diamonds became widely known to the western world primarily through the narrations of famous travellers and acclaimed writers such as Marco Polo (AD 1296), Nicolas Conti (1420), Nikitin (1466) and Tavernier (1650), who visited India when diamond mining was at its zenith. Great Indian diamonds such as