

many aspects, such as source material for clothing, food, housing and transportation. Before the invention of paper-making technique in the ninth century, many important Chinese ancient books, such as the books of Confucius, were all written on bamboo slips. In a sense, bamboo has become a carrier of Chinese civilization. It might be said that if the discovery and use of corn created the splendid Indian culture and history, the use of bamboo created the prosperous civilization and history of China.

In traditional Chinese culture, the straight lines, nodes, hardness and hollow structure of bamboo symbolize the resilience, integrity, unselfishness, resoluteness, honorability, chastity, tenacity, mettle, longevity, condescension, abstention, truth, happiness and so on. Besides being a symbol of virtue, bamboo is endowed with soul and emotion. Chinese not only like the practical uses, but also the spirit of bamboo. Bamboo is sometimes regarded as an indispensable part of daily life by Chinese; this was expressed in the poem of a famous Chinese poet Su Shi in the Song Dynasty, that "I prefer to eat a meal without meat, not to have a home without bamboo." Bamboo is rich in cultural connotations and has influenced and promoted the formation of the sense of aesthetics and ethics of Chinese people, as well as the development of Chinese literature, painting, arts and crafts, garden art, religious culture, folk-custom and music culture (bamboo is an important material for making musical instruments in China). Because bamboo possesses uniquely beautiful and elegant stance as well as the abundant spiritual symbolization, from ancient times, bamboo as a important garden plant has been using widely in landscape design in China. Bamboo, pine and plum are regarded as three best friends or auspicious plants in winter. Additionally including chrysanthemum, they are called the four gentlemen of plant kingdom.

Although the bamboo resource is abundant and the history of use of bamboo is long enough in China, a comprehensive book dealing with Chinese bamboo resource has been rare. The book *Monograph on Bamboo in China* written by Yi et al., comprehensively re-

flected the latest research results on bamboo resource in China.

The book contains large numbers of Chinese species and a small number of introduced bamboo species, totalling 43 genera, 707 species, 52 varieties and 98 variants in Bambusoideae, among which there are more than 1910 pieces of color photos attached to 440 species, 36 varieties, 68 variants and 4 hybrids. Some of these photos were taken in many botanical gardens and bamboo gardens in China, and most of the others were taken in the natural sites where the model specimens originally grew. The morphological characteristics, origin, habitat and elevation of distribution of each species are described in detail. Abundant first-hand information is included in the book. Many data in the book were published for the first time, for example, the photos of more than 300 bamboo species (including the varieties and variants) in their original sites, and the photos of some single-species genera of bamboo. In the book, an elaborate identification key containing all bamboo species in 34 genera except for the species in the single-species genera and there is a map of the distribution of cold-resistant bamboo species. Furthermore, the book collected and listed almost all the original literature published about the newly found bamboo species after around 1996.

The book is well structured, and with few errors. The book has a strong scientific and practical values. Its publication will promote the research, exploitation, protection and management of the bamboo resource in China. This book can serve as a reference for persons who engage in phytotaxonomy, agriculture, forestry or other related fields, or the persons who are interested in bamboo.

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## ENVIRONMENT

### Tree of Rivers: The Story of the Amazon

By J. Hemming. 2008. Thames & Hudson Inc., 500 Fifth Avenue, New York, New York 10110 USA. 368 pages. 39.95 USD.

The environmental history of the Amazon has a new amazing book, and any naturalist interested in natural world heritages really wants to read it: it represents environmental history *par excellence*.

Most people don't appreciate that the Amazon River provides the cradle for our current western world's industrialization, and that we owe it. Holland's Golden Age, for instance was caused, in part, by sugar from

Brazil. Portugal's period of great wealth 1750s onwards was due to the inflow of gold discovered in Brazil (Minhas Gerais). And 1850 started "the world's greatest boom based on a living plant product", rubber (*Hevea brasiliensis*) and Castilla trees. It was exploited and its use intensified by T. Hancock (father of the international rubber industry), Dunlop, MacIntosh, Firestone, Goodyear (famous for inventing vulcanization), Michelin (France) and Ford (also known for its rubber plantations). A reference to a similar situation in Congo and the Belgium king is made, too. Further,

Amazonia was exploited early on for “drogas de ser-tao” (drugs of the wild: curupa powder, cacao, coffee, sugar and butter oil from turtle eggs; petroleum was not yet available).

The author selected 70 illustrations and 20 beautiful photos for this impressive book. Thematic maps allow for an overview. Definite strengths of this book are the details on early Portuguese and Spanish explorations. Sources from great chroniclers (e.g. G. de Carvajal) make for nicely rounded presentations. The 11 chapters of this publication show that beyond Portugal and Spain, many countries took part in the early exploration of Amazonia and making their claims; e.g., England, France, Germany, Russia, Austria, Belgium and the United States (this situation reminds us of Antarctica today). Exploring this vast area was only possible due to native paddlers doing all the work. The indigenous populations lived very successfully in the region for thousands of years and they had wealth without a relevant government! Tribes such as the Yanomami, Omagua, Mura, Mundurukuru, Nambiquara, Karaja and Canari are well covered (speaking languages such as Arwak, Carib and Tupi, as the Amazonian *lingua blanca*). The sophisticated *roca* farming and native pottery are elaborated on. The pacification process of the infamous Parintintin tribe is explained, and it is striking to learn that once tribes got contacted and made peace with, e.g. by the Brazilian government or anthropologists, they usually died out quickly (often due to diseases).

The Amazon represents a botanical wonder trough, and famous botanists such as R. Spruce (the greatest botanist of his century and who made the first western experience with cocaine, caapi, yopo and anaesthetics), A.R. Ferreira (whose collection in the Lisbon museum was later re-located to Paris, thanks to Napoleon), H. W. Bates and A. R. Wallace are given much attention. C. Waterton got described as the first environmentalist for Amazonia. With Amazonia being also the world's biggest freshwater fish reservoir, it makes for “the largest river in the largest forest”. It becomes clear that the Amazonia region matters globally because of Greenhouse Gases, Loss of Biodiversity and Global Warming (the term Ecological Services is not mentioned by the author though). The Amazon river has uncountable “Wagnerian waterfalls”, but its lower 2200 km are sailable right into Peru and make for an international waterway (a legal situation set up through political pressures by the U.S. and Britain). The eastern Andean slopes carry the world's richest biodiversity, and the Amazon basin represents nothing but the world's largest canopy cover, having 427 mammal species (but lacking large mammals like in Africa). Hemming explains that 90% of the animal biomass is actually from insects (the entomology section of this book covers only 1.5 pages though). We learn from the author that termites play a major role in the climate change discussion due to their methane release. For

Amazonia, 30 000 tree species are estimated, and 300 species per hectare can occur (A. Gentry's botany work remains unfortunately unmentioned). The highest known concentration of hallogenetic plants is located in the upper Amazonia (Sibundoy); related work by R. Evans Schultze from Harvard (the father of ethnobotany; a concept now widely exploited by pharmaceutical companies) is discussed.

Often overlooked elsewhere, the 368 pages of this book nicely emphasize relevant historical treaties (Tordesillas, Madrid, San Ildefonso, Peace of Paris, and Petropolis). Further, we learn that “Napoleon's invasion of Spain and Portugal had a profound impact in South America”, e.g. the Portuguese Royal family retreated to Rio Janeiro, and Brazil developed accordingly. The wealth of Manaus in its heyday due to the global rubber boom is also described in depth (including its opera house *Teatro Amazonas*, and electric trams).

But the Amazon of the last 500 years carries also a history of sexual abuse: “*the gloom of the forest*” “brings out the worst instincts of man, brutalizes the affections, hardens the emotions, and draws out with malign and terrible intention every evil and sordid lust”. An entire chapter is devoted to Cabanagem (a local rebellion and revenge against the Portuguese General Company of Commerce resulting in large-scale brutalities and atrocities; it is named after local migrant workers). Many of the sheer brutalities against the natives manifested themselves in the rubber trade. The ones related to the rubber baron J.C. Arana get a chapter of their own, and how W. Hardenburg and W. Perkins exposed single-handedly the human rights violations against the Witoto and Bora tribes in Putumayo. The double standards England played in this context are outlined, too, along with the role of the English Amazon Company. Malaria is basically man-made in South America (probably brought over from Africa from the 16th century onwards by the African slaves and Europeans). Other classic diseases such as beriberi and chagas are mentioned in most chapters. A massive depopulation of the Amazonian river banks was already reported by 1750.

Further, this book is teeming with breathtaking stories about explorers, historical figures, and the cruel colonial history. Five German anthropologists are also given some detail, as well as C. Uncle, the most influential anthropologist of the early 20<sup>th</sup> century, as well as the Boa Villas brothers. One achievement of their work is that the Xingu tribes can now obtain Brazilian medical treatment. The recent feud centered on the “wonderfully rich varzea” between American anthropologists B. Meggers and A. Roosevelt is outlined. The author has visited many Amazonian tribes himself and is uniquely qualified to put explorations into a native context. And so, a good balance is achieved in this book because it also reports on the infamous Inka and modern native leaders.

The author makes a great case that Europeans did not manage to live sustainably on the land of Amazonia (or elsewhere really). Impacts of the huge but failed investments by American tycoons such as H. Ford in 1927 ("Fordlandia and Belterra"; pioneered by the U.S. Dept of Agriculture and Commerce in 1923) and D. K. Ludwig (1966; softwood and pulp plantations, planned for the world's biggest rice plantation and cattle ranch) are explained. Other American influences in the region are also well described, such as the U.S. attempt to influence Bolivia's rubber region near Acre (controlling 60% of the world's production).

The reader will be further fascinated by the history of the 'Red Bark Tree', Cinchona, with the fever bark "that contained the quinine palliative for malaria". C. Markham's involvement in the famous malaria medication, quinine (which got extracted as an alkaloid in 1820 by a French chemist) makes for a great read. The Cinchona trees were to be transplanted from South America to India helping to heal the Indian army suffering from malaria. But Peru did not allow the export of the plant because it did not want to lose its valuable monopoly. It was R. Spruce who defeated somewhat illegally the South American countries for the British Commonwealth and with help from Sir W. Huxley from the English Kew Botanical Gardens.

Amazonia represents the lungs of the world. Another fascinating topic deals with the modified forests in Amazona, such as planted palm trees for the acai fruit (*Euterpe oleracea*) as the world's most complete natural food. Timber makes for another precious product, specifically Mahogany (Swietenia; with every tree harvested 27 other trees get destroyed). We learn from this book that in 1997, 80% of the logging was illegal, and that selective logging is not working. These things were exposed by A. Cowell's famous work *The Decade of Destruction* exposing the "appalling deforestation, lawlessness and environmental mayhem of the 1980s". Further global awareness of Amazonia's problems were brought by Landsat satellite imagery, and work promoted by NOAA, INPE (Brasil's Space Research Institute), Amazon Research Institute (INPA) and FAO. The World Bank claims an overall 12% loss for Brazil's rainforest (Brazilians lower that estimate to 7%). By now, Amazonia's map shows a bizarre and wide network of reserve systems. Three main reasons for reserves are given in the book: to boost tribal morale, because indigenous people are good custodians of their own land, and because the reserve areas encompass most of the 40 un-contacted tribes.

Brazil is already the world's leading beef exporter. A less known, but equally big problem, is the huge soya-bean plantations. It's a phenomenon brought by high living standards and strong demands, specifically from India and China. The world's wealthiest soya producer, the governor of Matto Grosso, recently built a highway connected with a deep sea port (done without a relevant environmental impact study). Hemming

reports the involvement of U.S. companies such as Cargill.

Brazil was never short of development plans (slogan by politicians: "land without people for people without land"). Hemming concludes in another chapter that the plane, chainsaw and bulldozer did no good for the Amazonian environment. Famous roads and their negative impacts (e.g. Arc of deforestation near BR-10/153 and BR-364) are described. The largest oil find in the Amazonas basin (1964 by Texaco) is explained (but not the recent pipeline issues and that Ecuador became virtually bankrupt). For decades, China and Japan have been asking for access to Amazonia's wealth from the Pacific side. Brazil's latest development plans include the construction of 80 hydroelectric dams (often used for the provision of electricity to mines). The world's largest iron-ore deposit is located near the Xingu river (I think ALCAN gets away in this book with a way too positive image for its impacts). Protective plans for the Amazon such as the Pilot Program to Preserve Brazilian Rainforest PPG7 (set up by the G7 nations), the Sustainable Amazon Plan (PAS) and the System for the Protection of the Amazon (SIPAM) never halted the forest destruction.

When it comes to biology, biodiversity and wildlife management though, the text sections are less strong. This book is rather short on the liberation theology movement. It also must come to the reader as a shortcoming that despite its huge relevance and impact, the infamous *empate* (peaceful removal of squatters), Chico Mendes, Stephan Schwartzman and José Lutzenberger are only mentioned in passing. The role that the English Kew Botanical Garden, and its leader Sir J. Hooker, plays in the brutal exploitation of the Amazon, its people and resources, is indirectly mentioned but not so much how it relates with today's discussion on Biopiracy, and why Brazil is so reluctant to share with 'the North', and is not fond of the anglophone world and is still lacking trust. The author presents a nice twist, though, by stating that Brazil's coffee industry is based on seeds from elsewhere (Africa) where some of its slave laborers came from. Further, this book does not really cover Brazilian politics well, e.g. impacts of military coups, Brazil's quasi-dictator Vargas and Funai (Ministry of Indigenous People). Also, virtually no reference is made to the huge problems with the World Bank and its destructive funding schemes promoting economic growth. The 17 pages of literature sources I do not find well referenced.

This milestone publication convinces us that the future of Amazonia is in deep trouble. One hopes it will raise awareness for a global betterment of precious natural resources and landscapes, in Amazonia and beyond.

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