

post-modernism. The volume covers an eclectic mix of essays; starting with those on agrarian history in different parts of Europe to that of issues relating to the agrarian historiography of India.

Peter Taylor's essay draws on the concept of 'cultural hegemony' to elaborate how the state ideologies of 18th century Germany matched the ideologies of family and household structures and relations. He details how familial norms and rules such as male primogeniture and inheritance rules led to the creation of a pool of men who were disinherited and therefore considered to be 'socially dead' and 'functional orphans' (p. 19). The expansive state appropriated such disconnected individuals into its own military regime and in many ways laid the basis for such marginal members to become, at a later stage, the most cruel and devout supporters of the Nazi regime. Going beyond historical data culled from various sources, Taylor draws on an analysis of even folk tales such as those collected by the Grimm brothers to indicate the cultural construction of marginal males in German society. Similar to this essay is Hermann Rebel's article on Austria which seeks to discern the social and agrarian bases of Fascism. Locating everyday life space and 'villages in larger systems' (p. 47), Rebel draws on Rene Girard's work on violence and its paradoxes to understand the 'dark events and lynching scenes' of 19th century Austria. Shifting to an understanding of agrarian issues in 18th century France is Peter Jones' essay that draws on the 'matrix events' such as the French revolution that 'destroyed the feudal regime but consolidated agrarian structures of France' (p. 74). In linking the past to the present, Jones indicates how agricultural and agrarian issues remain a key symbol even in contemporary France. In her essay, 'Imagining the Harvest in Early Modern Europe', Liana Vardi analyses paintings and some poetry of the period to indicate the shifts in the imagining and representation of rural life in the continent. She throws light on an interesting trend, when she notes that while paintings of the countryside were represented with peasants and workers in the 16th century, the 17th century saw an emphasis on the elite and the aristocracy. As with Raymod William's analyses of British poetry, Vardi indicates how the pastoral idyllic of the 17th century paintings represented not the reality (which was largely violent and brutal) but

that of an ideal of a countryside that was peaceful and heartwarming.

The second set of essays focus on debates and themes from India and address a range of key issues pertinent to understanding the ecological, agrarian and peasant history of the nation. Paul Greenough challenges the 'standard environment narrative' which for South Asia consists of a narrative that idealizes the pre-modern and pre-colonial social and ecological links. Greenough provides an alternative view by highlighting the details of the faunal resources in the region and indicating the frequent violent encounters between humans and animals. David Arnold's essay draws on his earlier research on the epidemics in colonial India and argues for recognizing the extent to which the malaria resistance of tribals also enabled them, until a period, to resist political and economic encroachment on their terrain. A commentary on the use of technology and know-how indicates how DDT and the national malaria control programme then eroded this defense against intrusion and laid the basis for the increasing appropriation and exploitation of tribal resources and land. In an incisive and summative critique of Subaltern Studies, David Ludden points to the narrow perspective with which rural subcontinent has been understood and chastises the school for overlooking issues of caste and class structures, development and technological changes and focusing primarily on the expressions, languages and subordination and resistance of tribals and peasants. As the author of the seminal book on the agrarian history of South India, Ludden calls attention to the ecological, economic, social and agrarian diversities of rural India and to results of the colonial and post-colonial structures that have impacted them. Ronald Herring interrogates Karl Polanyi's thesis of the market as an agency of disruption and details how the communist party in Kerala drew on the ideology and structures of a pre-market system to re-organize the state on new political and economic structures. In what is a novel endeavour, Herring details the success of the leftist regime in Kerala to initiate the re-organization of labour and social relations which until then were mired in 'social moorings of humiliation and subordination' (p. 242). Deploying unions and ration shops as the new structures and symbols of the Left regime, the state provided, according to Herring,

an alternative that catered to the collective needs of the labouring poor.

In the final essay of the volume, Herman Daly argues for recognizing the worth of nature and natural resources as capital which needs to be sustained. Arguing against the dominant paradigms of neo-liberal economics, Daly calls for a development orientation and economics which places nature at the centre of the system and in which an orientation to 'green the GNP' (p. 268) is made. The volume as a whole is enriching reading but would have been more comprehensive if essays representing trends in South America and Africa were included. One hopes the volume will be followed by others that will indicate the centrality of rural life, agrarian conditions and nature to a world which is increasingly turning urban and metropolitan.

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Geology of Rajasthan (Northwest India) Precambrian to Recent. A. B. Roy and S. R. Jakhar. Scientific Publishers (India), P.O. Box 91, Jodhpur. 2002. Price: Rs 1900, US \$ 125.

Rajasthan is one of the most fascinating tracts in India preserving the record of about 3.5 billion years of earth's history and the book under review presents a comprehensive account of its geology. A. B. Roy and his associates have made signal contributions to the Precambrian geology of Rajasthan and the account in this book is strongly coloured by the perception of their school about various facets of the geology of this terrain.

The book starts with a brief description of the main geomorphic units in Rajasthan, followed by a chapter on geophysical studies. Deep continental reflection profiling was carried out in Rajasthan as part of an integrated study along a transect. Roy and Jakhar summarize the information gathered during this exercise. However, some parts of the geological section that is given in the book do not match with the seismic profile. For example, the reflectors above the Great Boundary Fault have lower dip than the thrusts shown in the geological section; there is no expression of the domal reflectors below the Delhi Fold belt in the section; the steep dipping thrust separating the S.M.C. and A.S.G. in the section has no counterpart in the seismic profile.

That the basement gneissic complex in Rajasthan is made up of a number of components of diverse ages has long been recognized. Gupta (*Mem. Geol. Surv. India*, 1934, **65**, 107–168), went so far as to designate two groups as BGC 1 and BGC 2, which roughly correspond to the Mewar Gneissic Complex and Sandmata Complex respectively of Roy and Jakhar and to Mangalwar Complex and Mangalwara–Sandmata complex of Sinha Roy *et al.* (*Geology of Rajasthan*, Geological Society of India, Bangalore, 1998, pp 1–278). Precambrian stratigraphy of India is plagued by a confusing plethora of names and there is an urgent necessity to institute a Commission to standardize the stratigraphic nomenclature. Perhaps the Geological Society of India and the Geological Survey of India can jointly take a lead in this matter. The Sandmata Complex, according to Roy and Jakhar, is a tectonothermally reworked basement. However, except for a solitary zircon date (for which details are not given), no Archaean dates are obtained from this region. The authors refer to the work of Naha and his co-workers on the migmatized and remobilized characters of some of these rocks. However, Naha considered these to be migmatized Aravalli–Raijalo metasediments and not Archaean basement.

The findings of Roy and his co-workers on the internal stratigraphy and structural pattern of the Palaeoproterozoic Aravalli Supergroup are summarized in chapter 5. They have rightly emphasized that in a multiple deformed terrain, the stratigraphic sequence should not be erected on the notion of uniform direction of younging. I am, however, intrigued by the

status of the Debari Formation in Table 5.1 of their book. In their 1988 paper, Roy *et al.* (*Mem. Geol. Soc. India*, 1988, **7**, 121–138) placed the Debari Formation below the Udaipur Formation. Apparently they have revised their view and are now placing it much above the Udaipur Formation. The arkose–conglomerate at the northern tip of the Sarara inlier was shown as a part of the Debari Formation in their earlier map; now this outcrop is split up into two units, the inner one is marked as the Sishmagra conglomerate facies of the Udaipur Formation and the outer one as the Debari Formation (Dantalia Quartzite). The reason for bringing about these changes is not convincingly discussed.

The relation between the Aravalli Supergroup in the Udaipur region and the supracrustal belts further east has been a matter of great controversy. Roy and Jakhar point out that there is no rational basis for defining the Bhilwara Supergroup, because gneisses, granites and supracrustals of diverse age and parentage are placed within this unit. Heron regarded the supracrustal rocks from all the eastern belts as belonging to the Aravalli ‘System’. Roy and Jakhar endorse this view. However, even if one accepts that these eastern sequences are time-equivalents of the Aravallis, they do show some differences in lithological association, and implicit in Roy and Jakhar’s model of Aravalli basin evolution is the admission that the different supracrustal belts were deposited in different basins. A case may, therefore, be made for giving different lithostratigraphic names for the sequences deposited in different basins under different environmental conditions. The other vexing question is the stratigraphic status of the gneisses that surround the eastern supracrustal belts. Roy and Jakhar are of the view that these are migmatitic paragneisses distinct from the pre-Aravalli orthogneisses. However, not much data are presented to support this contention.

Chapter 6 describes the younger Delhi Supergroup. Roy and Jakhar are against their subdivision into North Delhi Fold Belt (NDFB) and South Delhi Fold Belt (SDFB), but recognize the differences in the lithopackages and admit that the ‘rocks constituting the Delhi Supergroup was (*sic*) deposited in distinctly different sub-basins having dissimilar history of basin evolution’. They name the two principal divisions as Alwar–Bayana Basins and

Main Delhi Basin. They also remark that no direct stratigraphic correlation is possible between the rocks of the Main Delhi Basin and those of the Alwar–Bayana Basins. They insist on ‘a single-stage orogenic evolution’ of the entire Delhi Fold belt though it is difficult to fit this picture with the diverse radiometric dates from this belt. There is a misrepresentation of the idea of Gupta *et al.* (*Rec. Geol. Surv. India*, 1995, **120**, 12–26); they did not arrange the different Groups within the Delhis of SDFB in the order indicated by Roy and Jakhar. They advocated time-equivalency of the Barotiya, Sendra and Rajgarh Groups and a younger status of the Bhim Group. Roy and Jakhar mention about a folded unconformity in the northern part of SDFB. But they do not mention where this unconformity is visible. None of the maps in the book reveal any unconformity in this region and to say that Sengupta’s (*Indian J. Earth Sci.*, 1984, **11**, 38–49) analysis indicates an unconformable relationship between the northern and southern sequences is a misrepresentation of his work. They also ignore the significance of the zircon dates of 1832 Ma from felsic volcanics in the Khetri belt, 1850 Ma from Anasagar Gneiss in the Ajmer region, 986 Ma from felsic volcanics in the Barotiya Group and 987 Ma from felsic volcanics near Deri–Ambaji in the SDFB. If the rocks of Barotiya and Deri–Ambaji are accepted to be parts of the Delhi Supergroup the closing age of the orogeny cannot be 1450 Ma in the SDFB.

The Mesoproterozoic and Neoproterozoic geology of Rajasthan are described in chapters 7 and 8. Fairly detailed accounts of Mesozoic and Tertiary stratigraphy and Mesozoic–Tertiary magmatism are given in chapters 9 and 10. Chapter 11 deals with Quaternary geology and neotectonism. Roy and Jakhar refer to several workers who have discovered palaeochannels in the Thar Desert region from satellite imageries and have concluded that high energy fluvial regime existed in the western region in late Quaternary period, signifying the presence of a large glacier-fed Himalayan river flowing through the region. Like many other scholars Roy and Jakhar believe that this river is the Saraswati referred to in the Vedic literature. They hypothesize that at a certain time the mighty Himalayan River followed the course of the Luni River. They speculate that this was the time when

Vedic civilization flourished in the land north of the present day Luni. According to them later neotectonic movements made the northern part of the Aravalli Mountains to subside, which paved the way for the River Yamuna to pirate the Saraswati waters and flow eastwards, leading to the extinction of the once mighty Saraswati. However, this account would remain merely an interesting 'story', until it is corroborated by convincing documentation and precise dating of the geological events, like uplift, subsidence, migration of palaeochannels and tying them up with archaeological record and dates. The last chapter of the book describes the synoptic history of Rajasthan from Archaean to Recent.

A large number of maps and photographs supplement the description. Unfortunately, the value of many of the maps is somewhat diminished because only some place names are given without any latitude-longitude and it is difficult to place the maps in a regional framework. Small index maps showing the locations of the detailed maps would have been useful. Similarly localities of most of the photographs are not mentioned. The authors have freely expressed their strong opinions on the contending hypotheses on many issues, but at places they express their views without mentioning the logic behind them. The writing is lucid, though at places they have used some quaint expressions (e.g. 'the lineations are polarized', p. 54; 'inverted zone of basin margin fault', p. 74; 'lithospheric crust', p. 119) which could have been avoided. The index of the book is a source of irritation. The items are arranged in such a haphazard way that it is almost impossible to locate a topic.

In spite of a few shortcomings it is an extremely valuable scientific publication in which researchers from a wide field of geology would find that topics which interest them are discussed in details and with perception. This is a book which no scientist desirous of having an in-depth knowledge of Rajasthan geology can do without.

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The Forgiveness of Nature: The Story of Grass. Graham Harvey. Vintage. Random House, 20 Vauxhall Bridge Road, London, England. 2002. 372 pp. £ 7.99.

'All flesh is grass', says the *Bible*. The truth of this statement is amply borne out in Graham Harvey's exquisitely written book on the story of grass and grasslands and how these have shaped man's culture and civilization. The title *The Forgiveness of Nature* is taken from an article in praise of the bluegrass that the US Senator John James Ingalls published in the *Kansas Magazine* in the 1870s. It outlines the impact one family, the Hominiidae with just one species (*Homo sapiens*) has had on another, the Poaceae (or Gramineae) with over 10,000 species, and how the destinies of these two families have become intertwined. Poaceae preceded Hominidae by almost 55 million years, yet the association between human beings and grasslands has been 'close and long-lasting'. No other plant family has played such a crucial role in the advance of human civilization. As a Chinese saying goes, the most precious things are not jade or pearls, but the five grains: rice, wheat, millet, sorghum, and maize, which trace their origin to wild grasses. They account for 60% of the calories consumed by people in the developing world, while animal protein and fat are obtained from grazing animals. 'Grass,' according to Harvey, 'is a reminder that we have a history older than our lives.' The book also describes the evolution of the practice of animal husbandry in Great Britain from the Middle Ages to the present, which brought untold wealth and prosperity to the British farmers. Graham Harvey is the Agricultural Story Editor of *The Archers*, and he embellishes his narrative with interesting accounts of the impact of grass on sports such as football, cricket and lawn tennis.

According to an early Greek legend, mankind owes the ability to cultivate crops to the generosity of Persephone's mother Demeter, the goddess of crops who gave some wheat seeds to a priest who then broadcast them across the Earth, thereby sowing the dual blessings of agriculture and civilization. The Euphrates Valley in Iraq is where agriculture began. Grasslands were always associated with freedom and mobility. Pasture in Greek is *nomos*, from which the word nomad was derived. Thus as Harvey points out, 'the nomad is a mobile pastoralist, the owner

and breeder of domesticated animals'. Livestock were central to the mobile Neolithic pastoralists, who bred the wild ox or auroch. It is not known how or why nomadic communities ceased their way of life and settled down to a lifetime of tilling the soil. For, contrary to the popular notion, the hunter-gatherer lifestyle is not harsh. 'By the sweat of thy face shalt thou eat bread' might have been the injunction given by God when he banished Adam and Eve from the Garden of Eden - implying that they would have to struggle hard for their survival. But this is not so as far as the Kung Bushmen of the Kalahari desert in South Africa are concerned. They spend less than a quarter of the working week in gathering food. Compared to the subsistence farmer, the hunter-gatherer has time even for leisure!

The study of grasses is known as Agrostology. Grasses trace their origin to the family Liliaceae. They first made their appearance in the fossil record about 55 million years ago, just 10 million years after the demise of the dinosaurs. Grasslands occupy almost a quarter of the Earth's land area extending from Alaska to Antarctica. They are the dominant natural vegetation of the prairies of North America, savannahs of Africa and steppes of Central Asia. They range in size from tiny herbaceous plants to giant woody bamboos of Burma and China, and make up one of the four great terrestrial habitats or biomes, the others being forest, desert and tundra. Ironically, grasslands owe their survival to a certain amount of aridity, for too much rainfall will ensure their replacement by forest trees. Grasses appear to thrive in areas devastated by man. In general, the more fertile the soil, the fewer the grass species it is likely to contain. Their success lies in their power of reproduction and speed at which they colonize new areas. Many people suffer from hay fever in summer when flowers throw up their pollen filling the air. Their flowers, however, are not colourful since they are pollinated by wind and not insects. Despite the fact that flowers of most grasses are hermaphrodite, there are mechanisms to prevent self-fertilization. The stigma can recognize and reject pollen produced by the same flower!

Green plants harness the energy of sunlight absorbed by chlorophyll to build organic compounds from water and carbon dioxide. Grasses transform between