here) adds to this problem

This book seeks to bridge this gap by providing a ready reference on where in the digital world of the 'world-wide-web' should one look for in various branches of earth sciences On that account, the book is worth recommending to all graduate and undergraduate teaching institutions

The first two chapters of the book give a background of the digital world of data The section on search engines and their structures in the second chapter of the book is an eye-opener for the beginner and I am sure that this will provide an invaluable insight to the users of this book on how to enrich oneself through the vast data available via the internet These details will be rarely if ever available to standard earth sciences students

The ensuing 6 chapters capture the various resource addresses in a classified sequence covering various branches of earth sciences Polar regions, Geochemistry, Geophysics and Environmental studies, Marine sciences, Palaeontology and finally Geology and Geomorphology have been covered in these chapters Under various subheads within each chapter, the catalogue of the "web-site" (its url address), followed by its ownership / host and a summary of its contents has been given This provides a kind of 'ready-reckoner' for various subjects listed in the book The classification of the sub-branches of earth sciences followed by the author may be open to some criticism At the same time, complete absence of coverage of some key branches of earth sciences such as "Stratigraphy" and 'Meteorology / Climate studies' is shocking

The concluding chapter comments on the current state of the art, points out that most (if not all) of the sources of this data are located in select developed countries and that access to earth science information from the rest of the world is still lacking The indexing provided in the book is extensive and deserves to be applauded While the author has maintained neutrality in terms of qualifying various websites in terms of their contents, such studied opinions would have added flavour to this compilation

Kalyani Net Ventures Ltd VIVEK S KALE
Pune 411 036
Email vivekale@eth net

Ammonite Biostratigraphy of Middle to Late Jurassic Rocks of Jaisalmer Basin, Rajasthan, India.

Surendra Prasad (2006) *Palaeontologia Indica*, Memoirs of the Geological Survey of India, New Series, 52, xi+146 p , 21 pls , Calcutta ISSN 0970-0258

It is perhaps a truism to claim that the Jurassic is today the best understood of the three Systems that make up the Mesozoic Its geological history is recorded world-wide in unsurpassed detail This happy result owes much to the presence of ammonites as guide-fossils, which have made possible the time-correlations of rocks across distances and at levels of time-resolution having few rivals But even so, bioprovincial endemisms set limits to what can be achieved, in a pay-off between distance and time-resolution

One of the major bioprovincial schisms in Jurassic ammonite distributions lay between the northern and southern shelf-seas of the Neotethys Historically, those of the northern regions as seen in Europe provided the earliest descriptions, going back notably to d'Orbigny and Oppel in the first half of the 19th century But the recognition of the richest development in the southern palaeohemisphere quickly followed It lies in the neritic shelf-sea sediments of the Kutch basin in western India These attracted attention from the earliest days and mapping by the Geological Survey of India, together with detailed biostratigraphy by Ferdinand Stoliczka in the years 1871-72, led to the publication of one of the most important works on ammonites ever to appear The author was Wilhelm Waagen, pupil of Oppel, the model was Oppel's *Die Juraformation*, the work appeared in 1873-75, only a decade and a half later, it was published in *Palaeontologia Indica*, and it remains as fundamental today as it was when published All subsequent work, adding much from new collections, continues to be built upon it

But it had also long been known that besides Kutch there is another region in western India in which marine Jurassic rocks occur It lies to the north-west of Jaisalmer in Rajasthan, about 400 km NNE of 'Mainland' Kutch and it forms the subject of the monograph under review Compared with Kutch, however, there are difficulties The outcrops lie in the desert of western Rajasthan, which is widely covered in shifting sands with little or no rainfall to create new exposures Outcrops are scattered, discontinuous and deeply weathered The total area is also only about a tenth that of Kutch Finally, ammonites are much sparser, samples from a bed or locality rarely exceeding a few specimens The present work sets out to provide a more comprehensive synthesis and is based on the field-work of the author over several years

On the lithostratigraphical side, we are given a survey of localities, sections, Formations and their Members, both in text and in 14 graphical tables The descriptions of lithologies are still rather basic and might leave a sedimentologist wishing for more Nevertheless, in the inevitable comparison with Kutch, the first impression is one of overall similarity, with some striking differences The main body of sediments to have yielded the ammonites described here belong to the Jaisalmer Formation (230 m), which correlates well with the Chari Formation (or Group) of Kutch Notable is the seeming presence in the lower part also in Jaisalmer of one of the great specialities of Kutch, that of the Golden Oolite, made up of genuine ooliths coated with a slightly ferruginous iridescent coating of calcite, found there sometimes in huge banks at various levels of from Upper Bathonian to Lower Callovian ages Near the top of the Jaisalmer Formation occurs also the other speciality of Kutch, the so-called Dhosa Oolite, a thin but sedimentologically very complex marker-bed underlying a major non-sequence

The main body of the work is however concerned with a description of the ammonites The new collections are now described in greater detail, illustrated in 21 plates They are assigned to some 60 or so nominal taxa at specific rank distributed over 34 genera or subgenera But it has to be said at the outset that the taxonomy is strictly in terms of morphotaxa, matching individual specimens with others that have been described under similarly morpho-taxonomic names Of the 60 nominal species cited, 40 are based on types from Kutch Discussions at this level must therefore be largely subjective, and the reader must decide for himself what to make of the assignments Perhaps more serious, however, is the status of new names, of which some nine new ones at species-group level are introduced here Of these, all but one are based on at most two specimens

To conclude, the present work marks a valuable addition to our knowledge of the Subaustral Jurassic in western India In this, even if the development at Jaisalmer may not claim to be more than following behind the leading position of Kutch, it is none the less valuable for that It is good to see the present descriptions following in the steps of the early explorers and still in the same series of publications, the *Palaeontologia Indica*

Univ College, London JOHN CALLOMON
Email john-h callomon@tiscali co uk

DISCUSSION

Crustal Velocity Structure of the Narmada-Son Lineament along the Thuadara-Sendhwa-Sindad Profile in the NW Part of Central India and its Geodynamic Implications by A R Sridhar, H C Tewari, V Vijaya Rao, N Satyavani and N K Thakur

Jour Geol Soc India, v 69, 2007, pp 1147-1160

D.N. Avasthi, C-190, Sarita Vihar, New Delhi - 110 076, *Email* dnavasthi@ hotmail com comments

In the paper, the authors have identified a 12-16 km thick layer of P-wave seismic velocity of 7 2-7 5 km/sec at the base of the crust to a magmatic underplating of the crust probably due to the Deccan volcanism caused by the transit of western India over Reunion Hot Spot, which was activated by a major mantle plume It is mentioned that when the mushroom type plume head finds a low viscosity environment of a weak decoupling lower continental crust, it spreads the plume material (magma) laterally leading to magmatic underplating The extrusion of plume material (i e magma) on the surface leads to flood basalts, which in the case of India is known as the Deccan Flood Basalt The authors have drawn support for this theory from a few decades old publications, and mainly from White et al , Geophys Jour Roy, Astron Soc , 1987)

However, the difference in the P-wave velocity values in the assumed underplated layer below the crust (~7 4 km/sec) and in its assumed surface extrusion as Deccan Basalts (~4 9 km/sec) is too glaring to be ignored If Deccan Flood Basalts represent the surface extrusion of the plume material underplating the lower crust, it becomes imperative to examine the physico-chemical process by which the surface extrusion of the mantle material gets depleted in its elastic property to over 65% of what it possesses as underplated mantle material Experimental data explaining this very significant material of density 2 9-3 3 kg/l and modulus of elasticity ~169-76 MKS units to ~66 03 <KS units in Deccan Trap rocks of density 2 5-3 0 kg/l would be needed to support the theory assumed by the authors

Considerable progress in the understanding of solid earth processes has been made over the last two decades and it would be prudent to look for other possibilities that can explain the 7 4 km/sec P-wave velocity in the layer between the lower crust and the upper mantle without invoking underplating of the lower crust by the magma In this regard, attention is invited to the seismic tomographic work done by Replumaz et al (EPSL, 2004), CSS work in western offshore by the DGH, India (Avasthi, DCS Newsletter, 2003) and in Makran coast by Schluter et al (Marine Geology, 2002) The cause of low P-wave velocity layer below the crust could be due to the behaviour of lithospheric plates in the plate tectonics regime When an oceanic plate collides with a continental plate, linearity of subduction process gets distorted, resulting in a roll back of the upper mantle Simulation of active tectonic process between a convecting mantle and moving continent has shown that roll back of subduction takes place in front of moving continent (Trubitsyn et al Geophy Jour Intl , 2006), leading to the continental crust over-riding the subducting oceanic crust Because of the roll back of the subducting plate, the ocean crust and the upper mantle below it continues to rest below the continental crust over a long distance before it seeps down into the mantle, unlike the collision of oceanic plates, where the subducting plate plunges down into the mantle more sharply, giving rise to the breaks in the subducting plate known as the Benioff zones Examples of such over-riding juxtaposition of continental and oceanic crusts have been reported from the analysis of earthquake data (Rai et al Proc Indian Acad Sci (EPL), 1996), magnetotelluric studies (Gokarn et al 2006) and from detailed seismic imaging by Schluter et al (Marine Geology, 2002) and Avasthi (DCS Newsletter, 2003)

A.R. Sridhar, NGRI, Hyderabad - 500 007, *Email* azhisur74@yahoo co in replies

The comments of Dr D N Avasthi are very important, useful and thought provoking The response to the comments is given below

Velocity of the Deccan volcanics/trap determined from seismic studies from various profiles (Kaila and Krishna, 1992) is around 4 8-5 1 km/s Similar velocity is observed in the Rajmahal volcanics in the Mahanadi and Bengal basins The source for these volcanics is deep seated in the mantle of velocity >8 0 km/s The lower