very large production. At one time, almost since the Vedic ages, India appears to have been the only source of this valuable gem until about the early eighteenth century when diamonds were discovered in Borneo and later elsewhere. By this time diamond mining in our country had practically ceased to exist. Although ancient Sanskrit texts mention several areas where diamonds were found, verifiable historical records are available for only a few deposits. Mining activities in southern India – which in its time was the leading producer of this gem and had yielded some of the most famous stones in history – gradually declined and had become defunct by the time diamonds were discovered elsewhere in the world. Stray diamonds are still picked up occasionally from some localities in southern India, but regular production at present comes only from a single mine and numerous shallow workings in the Panna district of Madhya Pradesh. Here also sustained mining started after Independence though desultory operations there were going on since the mid-eighteenth century.

The Geological Survey of India almost since its inception a century and a half ago kept looking for this mineral but it was quite low in its priorities. After Independence the Survey along with other government and semi-government agencies kept searching for new deposits, but it is only since the last few years that their efforts are bearing fruit in identifying new occurrences of diamondiferous rocks. Diamond mining was nationalized in 1959 and the government reserved for itself exploration and exploitation of diamond which effectively killed the possibility of private initiative in developing this mineral potential. The recent opening of the economy has dereserved diamond along with a few other minerals, and this has now attracted some leading transnational mining companies to India. But the usual procrastination by the concerned state governments in awarding licences is holding up exploration and exploitation of this core mineral. Diamond is not only an item of jewellery but its industrial applications are equally important. We imported Rs 6874 crores worth of rough diamonds in 1995–96 but sadly produced only Rs 18 crores worth during the same period. If our government had been alert after opening up the diamond sector to private enterprise we would possibly have been in a position by this time to correct this imbalance to some extent.

The last connected account of diamond deposits in India was published by V. Ball more than a century ago in 1881 and there was need to update it. The present book by Babu fills this long-felt need. Its importance also lies in the fact that it describes the several new bodies of primary host rocks of diamond in the country that have been discovered during the last decade, besides giving information about already known occurrences though most of them are now defunct but have historical value. Information about old workings is quite often valuable because they are a pointer to possible rediscovery of rich mineral occurrences. In fact, some of the present day mineral deposits in India have been brought to light – and even successfully exploited – after examination of ancient workings whose records were lost in antiquity. Several kimberlite/lamproite bodies have been discovered in Andhra Pradesh and the adjoining tracts of Karnataka, some diamond-bearing, and this book gives their first connected account. The same is true of the newly found bodies in Chhattisgarh region of Madhya Pradesh though their treatment is not so detailed. The primary bodies, particularly the Majhgawan deposit in the Panna area, receives good treatment, but the shallow workings, which make a valuable addition to the current total production, are ignored. But on the whole, the book is an important contribution on diamonds in India as it is full of facts and statistical data and makes a good reference volume.

The publication also gives a general account about diamond, its industry and occurrences in other parts of the world. In fact, this occupies about half the pages of the book. While kimberlite, the primary host rock of diamond is discussed in detail, another newly identified primary source, lamproite, gets cursory attention. Several of the large primary bodies long considered as kimberlite are now identified as lamproite, and this rock certainly deserved much greater treatment in the book. Another glaring omission is the absence of the name of Venetia in the list of leading diamond areas/mines of the world. This mine produced 3.5 million carat diamonds in 1997 and is the richest mine in the world with the fantastic incidence of 127 carats per hundred tonnes of kimberlite. The undersea deposits are also ignored. Those off the continental shelf along the Namibian coast yielded 4.8 lakh carats in 1997. There is a whole chapter on basics of diamond cutting and polishing, but the Indian industry which employs about 7.5 lakh workers and exported finished diamonds worth Rs 15,375 crores, forming 79 per cent of the total Indian exports in 1994–95, gets only passing reference. The value of the book would have been enhanced if a chapter had been devoted to the cutting and polishing industry of India, mainly concentrated in Surat and Mumbai.

On the whole the book is well-written and nicely produced though the reproductions of photographs are poor as they are dark and lack detail and contrast.

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**Intraplate Deformation in the Central Indian Ocean Basin.** Yu. P. Neprochnov, D. Gopala Rao, C. Subrahmanyam and K. S. R. Murthy, eds. Memoir 39, Geological Society of India, Bangalore, 1998. XIV + 250 pp. Price: Rs 550.

This volume is the outgrowth of joint Indo-Russian (former USSR) research programme under the umbrella of project B 2.3: 'The crustal structure of the Indian Ocean Floor' of Integrated Long Term Programme (ILTP). The study was carried out under the following broad headings: bathymetry; seismics; shipborne geomagnetics; shipborne gravimetry; ocean bottom heatflow study; dudging of the basement rocks and geophysical and geological investigations. Two symposia were organized: first at NGRI, Hyderabad (1988) and second at Zvenigorod near Moscow (1990) by the initiative of V. K. Gaur (Indian Earth Science Coordinator) and Academician A. L. Yanshin (Russian Earth Science Coordinator).

The book contains fourteen chapters and covers the investigations carried out by the scientists of both the sides. The Indian institutions involved are: Indian Institute of Astrophysics, Bangalore; C-MMACS (CSIR), Bangalore; National Institute of Oceanography (NIO), Goa; National Geophysical Research Institute (NGRI), Hyderabad and Regional Centre (NIO), 176, Lawson's Bay, Vishakhapatnam.

The Russian institutions involved are: Moscow State University, Moscow; Institute of Oceanology, Russian Academy of Sciences (RAS), Moscow; South Branch of Institute of Oceanology, RAS, Golendjik; Institute of Geophysics, Ukranian; Academy of Sciences (UAS), Kiev; and Atlantic Branch of Institute of Oceanology, RAS, Kaliningrad. This project was obviously funded by the Department of Science and Technology (DST), Government of India and Academy of Sciences of Russia. The funds for publishing the monograph was made available by DST, NIO and NGRI.

Chapter 1 covers mainly the previous results and the researches carried out on Indian Ocean Lithosphere and a review of geophysical and geological results. Notable amongst them are the data generated by International Indian Ocean Expedition, Lamont–Doherty Geological Observatory, USA; and Scripps Institution of Oceanography, USA.

In Chapter 2, the cruises of Research Vessels (R/V) Prof. Dmitry Mendeleev, Prof. Shtokman and Academic Mstistav Keldysh have been covered. The outcome is classic discoveries in the Central part of Indian oceans: 1. Afanasy–Nikitin Seamount formed during late Cretaceous along the passive margin. 2. Oceanic Island Basalts (OIB) of the seamounts belong to hot-spot type intraplate alkaline magnetism. Seamounts forming volcanic islands were eroded during Paleocene. 3. Wave erosion and subsidence together with lithospheric plate volcano was transferred to guyot-type seamounts during Eocene. 4. Intraplate deformation is explained by the neotectonic deformation and extensional features along the spreading zone.

In Chapter 3, new bathymetric study has provided hummocky Seafloor with E–W trending elongated hills of seamounts (20 m ht – 45 km width) and deep out valleys with turbidite channels. According to Chapter 4, an estimated 4.4 cm/year rate of seafloor spreading during early Cenozoic is responsible for northward drift of Indian plate.

Chapter 5 describes that the gravity anomaly associated with topographic high could be explained with models of thinned crust of uplifted blocks. Thus the upliftment of basement wharping or sites of deformed basement are result of intraplate deformation. Convention in upper mantle causes mobility of the Indian plate. A large dimensional deformation and its correlation with global gravity minimum appears to be the near surface manifestation of deep processes in the mantle.

The average heatflow (Chapter 6) observed in the Indian ocean area is higher by 12 $m W m^{-2}$ than the standard value for 70 Ma age oceanic crust. This would be attributed to the result of dissipation of mechanical energy considering the two level plate tectonic model (Lobkovsky, 1988) with exothermal reaction of semiductile serpentinite creeps of subcrust lithosphere mantle into the lower crust.

The oceanic crust and sedimentary cover near the Afanasy Nikitin Seamount seem to have been affected by the continuous deformation during Miocene time, while the central Indian intraplate deformation took place only in short time since late Miocene (~ 7.5 Ma). This could be explained by pronounced lithostratigraphic heterogeneity caused by Afanasy Nikitin Seamount. Pulse of tectonic activity is also marked at Miocene–Pliocene boundary unconformity at 3.5 Ma by a mud turbidite flow. Thus two prominent unconformities are defined: Late Miocene (7 Ma), and upper erosion unconformity glacial and non-glacial sea level variation during upper Pliestocene 800 Ma (Chapter 7).

The seismic parameters revealed a three-layered crustal structure. Average sediment thickness is estimated to be 0.5 km. There is further scope to conduct seismic tomographic and detail results (Chapter 8).

In the Bay of Bengal almost all the intraplate earthquakes with known focal mechanism are characterized by strike-slip mechanism combined with thrust faulting. Ocean bottom seismological observations can enhance the detail and accuracy of regional seismicity. The ocean bottom seismometers seismic refraction hints at variation in thickness of crust and blocky mosaic structure bottom seismological observations in northern C/B area revealed unusual high microseismicity more than 100 weak earthquakes in ten days with epicentres located predominantly inside to E–W trending blocky mosaic structure. This may be due to episodic intraplate deformation (Chapter 9).

The accumulated basin sediments are characterized by denudation of Sri Lanka, Indian Peninsula and the Himalaya. Sediments consist of noncarbonate siliceous oozes: radiolarian-diatom, nannoplanktons, etc. Cu and Ni-rich manganese nodules are very common along with smectite and barite. Authigenic minerals are quartz, illite, feldspars, kaolinite, palygorskite. The sediments are accumulated below Carbonate Compensation Depth (CCD) and the sedimentation rate is about 3–5 m/my and the mass accumulation rate is 0.5–1.0 $g/cm^2/ky$. Early to late Oligocene turbidities mark the beginning of fast sedimentation derived from Himalaya. Polycyclic Aromatic Hydrocarbons (PAH) of the organic matter structure of the sediments are 26 to 180 μg/g (of dry sediments). They are widespread and typical of hydrothermal solutions and volcanic emanations. PAH can be used as important indicator of hydrothermal sources. These organic matters could be the source of rich gas hydrate for future energy resources. Seamounts revealed the migration from high latitude subtropical and to present position. Seamount-morphology and structure were constantly modified by neotectonic activity, volcanism and hydrothermal activity due to intraplate deformation (Chapter 10).

Oceanic Island Basalts (OIB) collected by submersible located near the transform-faults or at their intersection with ridge-axis basement within the intraplate deformation are composed of magnetite of upper Cretaceous age (Chapter 11).

Lobkovksy's (1988) concept of two-level plate tectonics explaining the tectonic intraplate deformation in Central Indian Ocean Basin is connected to lithospheric deformation below the Himalayan-Subduction zone. The viscous lower crust material, viz. serpentinites gets injected into the vicinity of Suture-zone of Himalaya, causing thickening of the lower crust. However, this model requires further refinement with the new geophysical data obtained by INDEPTH and other scientific agencies working in Himalayan-Tibetan region (Chapter 12).

The new tectonic model has only basement deformation whereas the overlying sedimentary cover remains unaffected (Chapter 13). The continuity of seamount with OIB type magnetism and its alignment with Ninety-east Ridge and its continuity to Rajmahal traps in Indian peninsula should open a new concept of hot-spot migration along the N–S alignment with the flight of Indian plate resulting into collision with Asian plate and the growth of Himalayan mountain.

The book is highly recommended for researchers and students with its treasure of acquired data by the joint Indian and Russian collaborative Programme. It can be easily purchased by a large number of scientists as well as librarians. There was enough scope to improve the quality of diagrams and figures, particularly of geophysical seismic profiles in original. The team should have taken pains to develop computer simulation model and to produce them as coloured diagrams. Overall, however, the entire Indian and Russian team has to be congratulated.

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