and economic development in more than 200 countries and territories. These tables provide data on a wide variety of indicators: Basic indicators (population, GNP per capita, average annual rate of inflation, life expectancy at birth, adult literacy), growth and structure of production, agriculture and food, commercial energy, structure of manufacturing, manufacturing earnings and output, growth of consumption and investment, central government expenditure and revenue, structure of merchandise imports and exports, balance of payments and reserves, development assistance from rich countries, total extent of debts, flow of public and private external capital, external public borrowing, external debt ratios, population and labour force, demography and fertility, health and nutrition, income distribution and PPP (purchasing power party) estimates of GNP, urbanization, infrastructure coverage and performance, and natural resources.

Data for 132 economies are given in the main tables, and basic indicators for 75 economies (for which either extensive data are not readily available or whose population is less than one million) are provided in a separate table. Although China and India *are* included in each one of the 33 tables, the column heading reads 'Low-income economies excluding China & India'. This perhaps is an editorial oversight in an otherwise excellently produced volume.

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Geology of Karnataka. B. P. Radhakrishna and R. Vaidyanadhan. Geological Society of India, Bangalore. 1994. pp. 298, Figs. 88, Tables 10. Price: Rs. 200/-

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The Geological Society of India has launched a commendable programme of publishing textbooks on the geology and mineral resources of various states. This fulfils a vital need of the student community, who had until now to make do with the textbooks on the geology of India, in which the states' share was necessarily small. The first in the series is the present volume on Karnataka, which is a classical and well-studied terrain of the Indian shield. The earlier text by B. Rama Rao (1962) needed thorough updating, and the recent *Memoir of the Geological Survey of India* by J. Swami Nath and M. Ramakrishnan (1981) covered only the southern part of the state and that too only the Precambrian rocks. The present volume is therefore very timely.

The book is divided into two parts, one on geology (252 pp.) by Dr. B. P. Radhakrishna and the other on geomorphology (40 pp.) by Prof. R. Vaidyanadhan. The volume commences with a fitting homage to the early pioneers of Karnataka geology like Captain Newbold, Bruce Foote, Smeeth, Slater, Fermor, Maclaren, Jayaram, Sampat Iyengar and Rama Rao, stopping short of Pichamuthu, who has transited into the current era. The second chapter summarizes the geology of Karnataka elegantly in a nutshell and is illustrated beautifully by a colour map on 1:3,000,000 scale. The geological story is nicely interwoven with contemporary ideas on plate tectonics, Archaean–Proterozoic boundary and early crustal development. Geochemical and geochronological data are only sparingly used to reinforce one point or the other. The authors have carefully tried to eliminate personal bias, but their conviction finds its expression nevertheless. The age-old belief that ultramafic–mafic cycles should necessarily be older than the sedimentary cycles is reflected in the treatment of ancient supracrustals and younger greenstone belts. For example, the ultramafic belts like Nuggihalli are regarded as being older than sedimentary belts of Holenarasipur and Sargur, and the eastern gold-rich greenstones (Kolar type) as being older than western Dharwar belts (Bababudan and Chitradurga). Such views are out of tune with the recent advances in the fields of geochronology and rapid revisions taking place in the geology of the better-known shields like Africa, Australia and Canada. However, to be fair to the authors, it may be said that they have hedged their opinions with alternatives in the text, although the accompanying tabular column, which is liable to make a more lasting impression, still reflects the author's predilection. A comparative table of the more recent and significant stratigraphic successions by other workers would have provided the perspective for a better appreciation of the tabular column (Table I, p. 11). Further, a brief comparative account of the geology of the cratons of Kaapvaal and Zimbabwe in Africa, which have a very close resemblance to Karnataka geology, would have whetted the curiosity of the more discerning students. Similarly, the perception of a nucleus and a mobile zone, both forming a part of the Dharwar craton, creates conflict with the widely accepted craton-mobile belt concepts, which may obfuscate the reader's vision of tectonic divisions of the shield. The next six chapters deal with detailed descriptions of the schists (Sargur, Kolar, Dharwar), gneisses, granulites and younger granites. Carbonatites and alkaline rocks have probably been overlooked. The simple and direct approach to the problem, lucid style and valuable illustrations result in an excellent narration in the inimitable style of Dr. Radhakrishna. A new student of Karnataka geology cannot ask for more. The next chapter on the Archaean–Proterozoic boundary, a pet theme of the author, covers the enigmatic situation where the round numbers of isotopic clocks do not always correspond to the profound breaks in rock record, leading to unresolved debate on the philosophy of erecting artificial boundaries.

The next two chapters on the younger Proterozoic sedimentary basins (the Purana basins) of Kaladgi and Bhima give an up-to-date and authentic account of the current advances, including the recent identification of Badami Group. The Precambrian story ends with a modern and balanced appraisal of Precambrian life, where every new enthusiastic find by someone meets with equally sceptic resistance by the traditionalists. The next major chapter on Deccan volcanic episode is preceded by an introduction to the concept of Gondwanaland. New ideas on Deccan volcanism are beautifully enumerated with the movement of the Indian plate northward and evolution of the Indian coastline. The next chapter on dyke rocks runs through several episodes of dyke emplacement in the craton. Dykes emphasize periods of crustal stability, but the multiple past

events in the craton are so complex that it requires a vast volume of data to formulate clear ideas on dyke chronology and crustal evolution

Tertiary period is the time of evolution of the present Indian landscape. Very clear ideas on landform development in Karnataka are fascinatingly presented here, followed by a chapter on laterite. Laterite is a term which originated in India from Malabar. It is extensively developed on the Western and Eastern Ghats. From its humble use as building and decorative stone, it is now being combed for the gold it may contain. The next chapter on black soils is another pet theme of the author. He has analysed its development intricately and provided a decisive account.

The volume concludes with a chapter on morphology and evolution by Prof. Vaidyanadhan. From the early emphasis on mineral wealth which led to intensive studies on the crystallines, geology in the service of man has now moved to societal problems like natural hazard mitigation, land use and conservation, preservation of environment, etc. Consequently, the focus has now shifted to geomorphology, Quaternary geology, engineering geology, environmental geology and seismotectonics. In tune with the times, the last chapter provides a valuable database on land forms for solving geological problems and initiating studies on sustainable development. What is missed here is a mention of the fascinating Talakad sand dunes covering the hoary temples, as pointed out by J. Swami Nath.

The book is a veritable storehouse of the state-of-the-art information analysed incisively and presented in easily readable style by the doyen of Karnataka geology (Padmashri Radhakrishna) and the acknowledged expert on geomorphology (Prof. Vaidyanadhan). The essence of geological knowledge is distilled into the text and adequately backed by appropriate and lovely illustrations. Selected bibliography at the end of the chapters provides good supplementary reading and the exclusion of references in the text has made the narration smooth and absorbing The book is reasonably priced Every student of Karnataka geology should possess this book as a beacon to guide him and every library should have it as a proud possession.

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HISTORICAL COMMENTARY AND NOTES

The dilemma of a fame-hunter

Reflections on Yellapragada SubbaRow centenary

S. P. K. Gupta

Doctor Yellapragada SubbaRow, had he been alive in this centenary year of his, might have presented his suit now to Lady Fame, whom he pursued all his life but did not to the end of his time feel himself worthy of For, not only have all his contributions to science and medicine stood the test of half a century, but are also making ever new conquests.

He was a freshman in Harvard Medical School's Biochemistry Department when in 1925 the textbooks carried the description of the Fiske–SubbaRow method for rapid colorimetric estimation of phosphorus in blood and urine. This very sensitive procedure he devised under the guidance of Dr Cyrus Fiske has become a classic in biochemical laboratory and clinical practice. It is taught to all biochemistry students and has helped generations of researchers to advance biochemical studies. It has, moreover, become in recent years a tool for diagnosis of endocrinal and metabolic diseases, including disorders of the thyroid and renal rickets

Yellapragada SubbaRow (1895–1948) 'An eminent medical mind of the century' – *New York Herald-tribune*

The method also helped SubbaRow and his senior collaborator to co-discover phosphocreatine and adenosine triphosphate (ATP), which demolished the claim that glycogen is the fountainhead of energy required for muscular contraction – the claim for which Archibald Hill and Otto Meyerhof were awarded the 1922 Nobel Prize for medicine and physiology. ATP is the key to energy for every sort of biochemical process, including muscular contraction, which gets the world's work done. Because it strengthens cerebral and coronary blood circulation and because of the evidence that adenosine and its nucleotides are present in neuromediators and neuromodulators in the central nervous system, ATP has been used in the management of a wide range of diseases, particularly of the joints and the musculature. This is a bonus SubbaRow himself might not have expected of his research