

BOOK REVIEWS

mind riding high on the wings of science and soulful spiritualism. Kalam's exhortation to all of us is that we should give wings to the divine fire we are all born with and have within us, and this will 'fill the world with the glow of its Goodness.'

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It was in the mid-sixties that I left my home and a national laboratory in a small town in Southern India to be baptized as a technical editor by the doyen of Indian technical editors the late A. Krishnamurti at the Publications and Information Directorate of CSIR in New Delhi. One of the first things Krishnamurti asked me to do was to check if journal titles given in references listed in research papers conformed to the abbreviations listed in the *World List of Periodicals*, a three-volume reference source published by Butterworth. Our copy of *The World List* – notwithstanding the sturdy paper and the excellent case binding – was struggling to remain in shape as its pages were constantly being thumbed through. Krishnamurti would not let pass a single non-standard abbreviation! The *World List* listed titles and other useful bibliographic information on printed journals and other serials. That was all there was those days. Those were also the days when I was bitten by the citation analysis bug and I and my associates used to spend countless hours in the libraries of the Indian National Scientific Documentation Centre and the Indian Agricultural Research Institute noting down data from the printed edition of *Science Citation Index*.

With the advent of electronic communication technology, things have changed. Now I use the CD-ROM edition of *SCI* for my research and download valuable data from web sites around the world. But, I just cannot help continuing to use printed journals, although according to this Directory there are at least 2459 electronic journals, 1049 of which are peer reviewed. I do browse *British Medical Journal* on the Web the day it is mounted on the Highwire server at Stanford University and I also get the embargoed news reports from *Nature* a day or two in advance of the issue being made available on the Web. But for accessing most other journals I continue to depend on good old print in libraries of the Indian Institute of Technology and Institute of Mathematical Sciences. A classic case of wasted opportunities: We know that many important journals and databases are available on the Web; we know that speedy access to these journals and databases can enhance India's research productivity; we know that the technology is affordable; and yet we have not done much to translate the access from the realm of the possible to reality.

If you visit ISI's web site you will know that it is now possible for someone using the *Web of Science* to quickly see on screen the full text of any article in hundreds of journals published by ISI's partner publishers in this venture such as Highwire Press, Academic Press, Wiley, American Institute of Physics and so on. Elsevier has made available hundreds of journals on the Web. Of course one has to pay a hefty sum as subscription.

Librarians around the world have been subscribing to scholarly journals for a few centuries, but find it difficult to reconcile to the demands made by the advent of the electronic journals. First of all, there is nothing that they could collect, display, bind at the end of the year, and put on rows and rows of shelves to facilitate archival searching! They are uncomfortable with licensing (as against paying a fixed sum as annual subscription to the printed journal). There are Internet lists such as Liblicense where librarians and publishers discuss what are acceptable practices in the electronic era. Surely the transition is not going to be smooth, but sooner or later much of both primary journals and

secondary services will be transmitted mostly electronically. For a while though both print and Web will coexist. Gutenberg is likely to lose to the Internet.

This two-in-one Directory – already dated! – lists all the known e-journals and newsletters as well as scholarly and professional discussion lists/e-conferences. Each e-journal entry gives a brief description of the journal, the web address, frequency, publisher, date of first issue, and contact address. ISSN and cost information are given wherever available. Entries of academic and professional discussion lists give a brief description of the list, and information on subscription, submission, archives and contact address. As in the previous editions, ARL has included a special article. This year's article on full text journal subscriptions written by Judy Luther is informative and gives a clear idea of what is happening. A crisp Foreword and a brief note on how to use the volume complete the Directory. There are several indexes: Thesaurus Index, Subject Index, and the Main Index.

If you buy the printed volume of the Directory, you and your colleagues can have access to the electronic form (on the Web) without any additional payment.

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Flood Studies in India. ed. Vishwas S. Kale. Memoir No. 41. Geological Society of India, P. B. No. 1922, Gavipuram P. O., Bangalore 560 019. 1998. 256 pp. Rs 500/-.

Floods are considered by laymen as mainly resulting from the incapacity of the river to carry the increased volume of water in its course, and hence resulting in overland flow and causing inundation of neighbouring lands. A meteorologist considers it as resulting from abnormal increases in the quantum

of rainfall during a short interval of time, generally in the catchment area. An hydrologist considers it as resulting from saturation of subsurface and the cross sectional area of the river not enough to carry forward the increased supply of water from the catchment area. A geomorphologist considers it as resulting from the channel geometry and the neighbouring landscape not being in equilibrium with the suddenly increased flow in the channel sometimes causing channel migration. An environmentalist invariably blames it on the destruction of natural vegetation in the catchment area causing soil erosion and increased overland flow. An engineer attributes it to the increase in bed load (silting) raising the bottom of the river bed over a long period of time and indicating the instability of the river to carry its normal volume of water, not to talk of the increased volume. An administrator is more often concerned about the effect of floods and devises plans to mitigate the sufferings of the affected. Thus it can be seen that the interest in the study of the floods and its effects is spread over a considerable section of the populace and it is no wonder that due to its devastating effects, the study is now receiving greater attention than before.

The volume under review contains 12 papers from different specialists in this field of study. The first one by Dhar and Nandagiri deals with meteorological factors (pp. 5–11) that cause floods, most of which are related to the monsoons during summer (June to September) and winter (October to December) and cyclones passing over the coasts from the adjoining seas. The orography of the country, particularly along the Western Ghats and the northeastern region, also plays an indirect part. This paper gives an exhaustive lists of major floods in India updated up to 1997, along with major characteristics (pp. 14–21).

To what extent the catchment characteristics, channel morphology and sediment transport parameters control or aid flooding in North Bihar in the Gangetic plain is discussed at length with other factors like hydro-meteorological, geomorphic, land use and geological by Sinha and Jain (pp. 28–41). The paper emphasizes the need for inclusion of geomorphometric parameters in flood analysis. Hwang Ho river is often re-

ferred to as the 'sorrow of China'. Perhaps Brahmaputra river in the northeast plays that role in our country and surprisingly both have the same average discharge at their respective mouths ($19830 \text{ m}^3 \text{ s}^{-1}$). The paper by Goswami, based on his excellent studies for over a decade on Brahmaputra river, treats in detail the flood regime and hydrology of the river with some suggestions on appropriate watershed management.

Flooding in the Himalaya mountains has an additional input besides those generally listed as causes, in the Peninsular region. In this paper Wohl and Cenderelli include floods due to snow-melt or the glacier-lake outbursts (GLOF). These are most unpredictable (pp. 81–89). Hydrologic factors like magnitude, duration and frequency of flood together with substrate factors like valley geometry and substrate resistance, control the spatial distribution of floods, particularly in the Himalaya (p. 86). Whereas most of the papers rightly emphasize the need to recognize and evaluate past floods to reasonably forecast future floods in any given region, in this paper methods of estimating them are also given (pp. 89–95). Starkel *et al.* deal with the floods in the Sikkim Himalaya, which is subject to neotectonic movements, and trace the changing flow pattern over a couple of centuries, particularly over the alluvial fans to its south (Figure 2, p. 103). Keeping in mind that erosion and deposition in this unstable environment is natural and one has only to devise appropriate methods to make the best use of the changing landscape, they have suggested some settlement patterns for the next few decades (Figure 10, p. 114). Quite a hue and cry is often made by environmentalists that it is the land use changes (deforestation in particular) in the Himalayas that bring about flooding in the plains. However, Hofer, with considerable data and case histories, shows that it is the rainfall over the flood plains that is mainly responsible for the generation of floods on a regional scale (pp. 129–134).

The paper by Avajit Gupta can be considered as a review of the state-of-the-art of geomorphic studies pertaining to floods made so far in India (p. 147). It draws particular attention to the varying flood effects in different climatic belts (Table 1, p. 144) and the

possible areas of future research in this field (p. 150). This is followed by the one by Seth, who besides suggesting methods of flood forecasting (pp. 161–163); lays greater emphasis on the proper flood management and control (pp. 165–168). An engineering approach of controlling floods, based on proper estimation, with a certain amount of mathematical analysis of collected data (pp. 178–184), of magnitude of flood peak, is discussed by Garde, along with suggestions on structural and non-structural methods of flood control (pp. 185–189).

Remote sensing has now become an important tool in the study of floods, particularly with its capacity to provide near real-time data, enabling preparation of maps to assess the damages caused, so that quick relief measures can be taken to mitigate the suffering of the affected and plan for proper remedial measures. Rao *et al.* have cited case histories of its utility in studies connected with floods (areal extent, zonation, damages) with good illustrations. A fervent appeal is made by Baker for the study of palaeoflood records which if done intensively, is bound to help in the forecasting of the effects of floods during the present times and thereby aid in planning for appropriate design of structures whether for irrigation, navigation, flood control or power generation. The last paper by Kale is a review of the flood effects of monsoons in India and the characteristics and pattern of flooding (pp. 231–236). It is necessary to recognize that absolute immunity from flood hazard cannot be attained, but attempts must be made to forecast and take proper measures at the right times before and after the event to mitigate its damaging effects.

It is only to be expected that in a volume of this kind where different scientists discuss about the same problem there is bound to be a certain amount of repetition in the treatment of some of the topics like causes of floods, flood control, methods of study, etc., but this is not necessarily a drawback. It only reinforces the commonality of approach in some cases. Of late, conflicting views are being expressed authoritatively by engineers on the utility of large dams as a device to control floods and aid in irrigation and power generation. The World Commission on Dams (WCD) is

seized of this problem. This assumes greater importance where two or three adjoining sovereign States are involved in the harnessing of the resources of a flowing river and contentious arguments are put forth by each for action/s taken or not taken in these States in their attempts to utilize these resources (for example, between Nepal, India and Bangladesh over the effects of flooding and engineering constructions along and/or across the rivers Gandak, Kosi and Tista). Only an unbiased scientific study can help in solving such problems.

It may be recalled that one of the first attempts made to gather studies on the fluvial processes and geomorphology of the Brahmaputra basin was made by the Geological Survey of India by holding a seminar in 1972. The proceedings were published much later in two volumes

(Misc. Publ. of GSI No. 32, 1977 and No. 46, 1981). Subsequently the officers of the Geological Survey of India, Northern Region, Lucknow and researchers from the Department of Geology, Lucknow University have contributed substantially on the fluvial processes and geomorphology (along with Quaternary stratigraphy) of the Ganges plains in parts of Uttar Pradesh and Bihar. Whereas different organizations in the country like India Meteorological Department (IMD), Central Water Commission (CWC), Central Water and Power Research Station (CWPRS), Central Ground Water Board (CGWB), Geological Survey of India (GSI) and certain individuals from Research Institutes and Universities have contributed independently to our knowledge of the floods and their effects in India, it is time that these and a

few more make concerted efforts to understand this problem in its totality and plan proper measures to mitigate the effects of floods. The importance of the present volume, ably edited by Kale, and published by the Geological Society of

India, Bangalore, however, lies in focussing attention on the causes of floods, methods of study, means of mitigating its effects and the need for recognizing paleofloods in order to reasonably forecast the intensity and timing of future floods. This publication will be of value to all those interested in the study of floods, in India.

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Current Science

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