literature on the subject. I found the book very readable and recommend it to those who plan to enter the interdisciplinary field of neuroscience. I could not find any mention of the price, but I do hope that it would be affordable. More than the students of neuroscience, this book could be a useful primer for those working in an allied field, who wish to get a basic understanding of the human brain.

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Detection and Isolation of Soil Fungi. Pierre Davet and Francis Rouxel, Science Publishers, Inc., Post Office Box 699, Enfield, New Hampshire 03748, USA. 2000. 188 pp. Price: not mentioned.

Soil as a reservoir for diverse populations of saprophytic and pathogenic fungi has been well recognized. Plant pathologists in particular, have appreciated the role of soil-inhabiting propagules of fungal pathogens in the onset of serious infections and epidemics on crop plants. Fungal metabolites originating from diverse genera and species of soil-inhabiting fungi and manufactured by fermentation processes have added further impetus to the need for a better understanding of the ecology, distribution, identification and culture of soil fungi. In this context, the publication of the book under review is a welcome compilation of information on the subject, on techniques from publications widely scattered in literature.

The subject matter is distributed in three parts. The first part describes the general principles associated with the basis for selective isolation and detection of diverse fungi, while the second part discusses, in considerable detail, the techniques and selective media formulations for the targeted culturing of a variety of important genera and species from natural habitats, with particular emphasis on phytopathogenic forms. The fungi have been listed in alphabetical order without being grouped on taxonomic relatedness. A detailed bibliography and indices for fungal names, organic compounds used, and techniques and media, form the concluding part of the book.

Isolation techniques have been discussed in detail, bringing out the usefulness as well as the advantages and disadvantages of the different approaches to fungal screening such as dilution plate method(s), baiting techniques and isolation from plant parts such as roots for plant pathogens. Selectivity factors contributed by physical treatment of the soil samples as well as the groupwise selectivity of various chemicals and antibiotics have been well documented under the culturing technique, which are supplemented by a list of basal media formulations suited for culturing soil fungi. The description of the techniques as well as media formulations is simple and easily understood and may be practised by biologists undertaking studies on isolating specific groups of fungi from the soil. The major portion of the text is devoted to the application of techniques and selective media for a large number of plant pathogenic and saprophytic fungi and in most of the cases more than one method has been described which would be very useful.

As stated by the authors in the preface, the work is a book of recipes, which will certainly be useful to those interested in the study of plant pathogenic fungi as well as saprophytic forms, their ecological distribution and selective isolation. Some of the useful additions to the well-written text could have been the culture of predaceous fungi infecting protozoa and nematodes, litter fungi and fungi associated with marine habitats, including woody substrates. The overall organization of the subject matter and its presentation is very good. The book can be expected to fulfil the need for a comprehensive compilation of screening techniques for a meaningful study of the ecology and biodiversity of fungi from soil and other natural habitats.

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An astro-trilogy

Indian Mathematics and Astronomy: Some Landmarks. Jnana Deep Publications, Bangalore, 261 pp.
Indian Astronomy, An Introduction. Universities Press, 3-5-819, Hyderguda, Hyderabad 500 029, ix + 207 pp.
Astrology: Believe it or not? Navakarnataka, 101, Crescent Road, Kumara Park, Bangalore 560 001, 153 pp.

All three books by: S. Balachandra Rao.

Right at the outset I wish to congratulate Balachandra Rao for doing us the signal service of writing the above three books. In different ways these books answer many questions that come to the lay as well as the not-so-lay minds concerning our ancient scientific heritage. We never stop telling ourselves that our ancestors right from the Vedic times were well informed on several scientific fronts. However, when pinned down with the question: 'What exactly did they know and at what epochs in the past?', there are very few of us who can give a satisfactory reply. Balachandra Rao (BR hereafter) provides us with useful information in simple and readable form.

Briefly, the three books cover separate aspects of the above issue and are aimed at different readerships. The first one tells us about the development of astronomy and mathematics from the Vedic to the colonial times. This book will be and should be appreciated by a reader with some understanding of elementary mathematics, although even a more general type of reader can catch the flavour of the march of ideas. The second goes into technical details, rederiving the mathematical results obtained by the ancients. Here knowledge of geometry, plane and spherical trigonometry and algebra will be required. The last book is aimed at general readership and describes the subject of astrology while pointing out why it is not a science. I strongly recommend this book to the general educated layperson, especially one who likes to regulate his/her life by astral considerations.

Indian Mathematics and Astronomy begins with an overview of the whole scenario and then proceeds in a chronological fashion, beginning with the Vedic lore, followed by the Vedanga

Jyotisha. The overview is well worth reading. There, we are told why the ancient geometors did not bother with logical proofs (as in Euclid) but stated results. They did so because their aim was to generate practical results like fixing times of religious rites, construction of altars and buildings, etc. The author bemoans the fact that because of this emphasis on applied aspects, the rigours of mathematics were ignored and later the pseudo-science of astrology coming from Greece and Babylon was 'received with open-arms'.

The author then goes through the works of individual astronomers/ mathematicians chronologically, starting with Aryabhata I, and is at pains to point out the scientific as opposed to the pseudo-scientific statements from the ancient works. Like Varaha Mihira's emphasis on observational verification of stated results, although he also dwelt on superstitious beliefs like portents. (Did not Newton also believe in alchemy?) It is also amusing to see the harsh words used by critics from opposing sides. In case today you are smarting under some unkind criticism of your paper by a referee, think of the words used by Brahmagupta about Aryabhata I: 'Since Aryabhata knows nothing of mathematics, celestial sphere or time, I have not separately mentioned his demerits.'

Going through the golden age of Indian mathematics and astronomy starting from Aryabhata I (5th century A.D.) and going to Bhaskara II (12th century A.D.), giving the important contributions of the various astronomers and mathematicians, the author points out those results which preceded the more well-known results of the Western mathematicians. In more than one place BR stresses the work of the Kerala scholars in later years, which is less well known. Again one finds that the emphasis in India was on intuitively knowing the result and its practical applications and explicit constructions rather than on its proof. It is interesting that he has a brief last chapter on Ramanujan who also 'saw' several results in number theory intuitively, most of which were later proved by other mathematicians.

This otherwise excellent account seems strangely to pass over any discussion of instrumentation used by Indian astronomers. Even in the pre-telescope times there were several instrumental aids for observing and locating stars and planets. Brahmadatta himself is quoted as insisting on observational verification and accuracy of results.

Indian Astronomy, the second of this set, covers a similar range of periods, but deals with more technical problems, like calendars and time measurements using astronomical observations, the true positions of the Sun and the Moon as well as planets, eclipse calculations, and also computer programmes doing the siddhantic calculations with some modern improvements. I have two criticisms to point out. The computer program are not accompanied by any statement of exactly what they are computing. The second point is that the geometrical figures could have been drawn more professionally.

If you were restricted to buying only one of these three books I would recommend the last one. In the ongoing controversy of whether astrology is a science, the astrologers often criticize the scientists for dismissing their subject without understanding it. So here BR presents the essentials of astrology in as systematic a way as possible.

He begins with the mathematical and astronomical works of the Vedic times and distinguishes it from the astrological inputs received later from the Greek and Babylonian traditions. (Thus the recent fuss by the UGC of teaching Vedic astrology is seen to be wrongly motivated as there was no astrological thinking in the Vedas!) BR then gives the methods of constructing a horoscope which of course vary from North to South India and from India to Europe. Some ancient horoscopes are discussed, and BR shows, for example, that the claimed horoscope of Lord Rama is an astronomical impossibility. For, the angular separation of inner planets can never be as large as shown on the horoscope.

Apart from this shaky starting point, BR emphasizes the shakiness of various predictions especially in the context of Indian politics of recent decades. He has reproduced predictions from well-established astrologers side by side with what actually happened. The lack of predictive power evident from such cases would alone disprove any case astrology might have for being called a science. There are also discussions of sociological and psychological aspects of beliefs in astrology.

The author could have given some more examples of western tests of astrological predictions which have proved to be negative. Since Indian astrologers are quite capable of saying that western astrology is all wrong, there is need for controlled experiments to test the veracity of predictions of Indian astrologers.

Balachandra Rao is Principal and Professor of Mathematics of the well known National College, Bangalore, an institution that has produced a refreshing breeze of scientific temper against the prevailing stagnant air of superstitions and false claims. I hope that these three books will be well patronized.

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