Astrology: Believe it or not?

A Sitaram

Astrology: Believe it or not?
S Balachandra Rao
Navakarnataka
2000, pp.156, Price: Rs. 65/-.

Thanks to the ill-conceived move by the UGC (around May 2001) to introduce astrology courses in Indian universities, this wonderful little book has been rescued from the obscurity that it might have otherwise lapsed into. If only it had received more prominence earlier, Balachandra Rao's book would have done more to debunk and expose the pseudo-science of astrology than all the myriad protest letters from scientists and academics in universities and institutes across the country. Indeed, the reviewer suffers a deep sense of mortification that he voiced his protest only after the introduction of 'vedic astrology' by the UGC as a legitimate subject was more or less a fait accompli, although various newspapers were warning us that the move was imminent. On the other hand, Balachandra Rao's book was published in the year 2000, which surely means that it was completed long before that. Why does one call astrology a pseudo-science? Well, this question is comprehensively answered by Balachandra Rao. Can it be considered as any kind of rational knowledge? No! Once again, Rao explains why not. What one really learns from this book is that astrology consists of a set of arbitrary rules made up aeons ago. These rules, which have no rational or even empirical basis to back them up, purport to predict how a person's life evolves based on planetary positions at the time of his or her birth. All disciplines should be based on rational thought and astrology is as far removed from rational thought as one can get! Thus, it has absolutely no place in our university education, either in a science department or in a humanities department. If the UGC wants our students to learn something about our heritage, let them introduce courses on various aspects of Indian culture. (It is perhaps important to remind oneself here that 'Indian' is not the same as 'Hindu'.)

Coming back to the book under review, here are some highlights and important aspects of the book: Chapter 1 is a nice introduction to ancient Indian mathematics and astronomy. Chapter 2 is about the origins of Indian astrology and the author presents a lot of evidence to support the view that there is nothing vedic about vedic astrology! After describing various calendars in detail, the author explains carefully in Chapter 13 what exactly a horoscope is and also compares various styles of horoscopes. Ironically enough it is clear from later chapters that these different styles lead to completely different predictions! In Chapters 15 through 19, he explains how horoscopes are used to make predictions by the different schools of thought(!). It is in Chapters 20 through 29 that the author is in his elements, mercilessly

destroying the claims of astrology with the piece-de-resistance being Chapter 29, aptly entitled Time to shun astrology. (The reviewer would seriously like to suggest to the UGC that this portion of the book be made compulsory course material in all universities.) The final chapter, Chapter 33 concludes with quotations from some of the finest minds of our times, Pandit Nehru, Swami Vivekananda and Karl Popper. The author would have done well to add the following quote from one of the most creative minds of all times (– no, not Newton or Einstein but Shakespeare!).

"This is the excellent foppery of the world, that, when we are sick in fortune, often the surfeit of our own behaviour – we make guilty of our disasters the sun, the moon, and the stars: as if we were villians by necessity; fools by heavenly compulsion; knaves, thieves, and treachers, by spherical predominance; drunkards, liars, and adulterers, by an enforced obedience of planetary influence; and all that we are evil in, by a divine thrusting on: an admirable evasion.... ."

To conclude, this book, priced at a modest sixty five rupees, is a must for every college student.

A Sitaram, Indian Statistical Institute, Bangalore Centre, R V College Post, Bangalore 560 059, India.

The Lady or the Tiger: A Review

S P Suresh

The Lady or the Tiger and Other Logic Puzzles
Raymond Smullyan
Oxford University Press
1987, pp.226.

Inspector Craig has again been called in on a life-saving mission. One of the top-security banks in Monte Carlo (for security reasons the name of the bank is withheld!), has just lost the combination of their biggest safe. (An overzealous clerk has safely deposited the only card containing the combination in the safe and locked it up!) The safe contains some state documents which must be produced within three months, and blowing the safe open is out of the question.

It is at this point that the readers are invited to join Craig in his hunt for the combination. The only clues available are a set of five rules which define a certain binary relation on the space of possible combinations.

Craig eventually succeeds in finding a combination which opens the lock, but before that he (along with the reader) has a series of fascinating encounters with some number machines invented by his friends Norman McCulloch and Malcolm Fergusson, which amazingly leads him to a combination that opens the safe.

All these encounters involve proving close variants of a famous result in the theory of

computable functions known as the second recursion theorem (or sometimes as the fixed-point theorem). This is a delightful theorem whose proof involves a positive use of double diagonalization (in contrast to the more usual negative use of double diagonalization in the proofs of theorems of Cantor, Tarski, Godel, Turing, and others). Smullyan's versions of the theorems are easily stated without an excess of formalism or notational baggage. They can all be phrased as: Find a program for this machine which is its own output (on any input)! These are a delight to solve for any puzzle buff. The main idea behind the proof of the fixed-point theorem is seen remarkably clearly as one solves Smullyan's puzzles.

But I should emphasise that one need not know anything about recursion theory to enjoy this book. A school kid with enough application can solve most of the puzzles found here.

After successfully solving the Monte Carlo Lock Mystery, Craig, McCulloch, and Fergusson (and the reader of course) have further adventures with some more number machines which bring them face to face with some of the deepest logical questions which are at the very heart of the discoveries by Godel, Turing, and others.

The first two parts of the book deal with the usual Smullyan puzzles of the knight-knave kind. These puzzles exclusively use propositional reasoning. The ability of Smullyan to weave such intricate puzzles as he does involving only propositional reasoning is amazing. Most readers are familiar with the Island of Knights and Knaves where knights always tell the truth and knaves always lie. This book also contain a lot of puzzles based on the above island or some close variant. It has introduced something new in the form of the Island of Questioners, whose inhabitants only communicate by asking questions. There are two types of inhabitants. The type A inhabitants only ask questions whose correct answer is yes, whereas the type B inhabitants only ask questions whose correct answer is no. The reader gets a flavour of life in this island by considering the following puzzle:

The Gordons are inhabitants of the island. Once Mr. Gordon asked his wife, "Darling, are we of different types?" Deduce what you can about each of them!

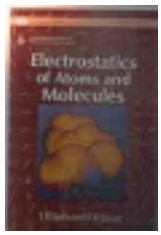
If you find this puzzle intriguing enough, then you're sure to enjoy Craig's adventures at the asylum of Dr. Tarr and Prof. Fether, where anybody, doctor or patient, can be either sane or insane, effectively sane people always tell the truth and insane people always lie and Craig's mission is to find out if there is an insane doctor in the asylum! Things really get out of hand in Transylvania where each inhabitant is either a human or a vampire, and either totally sane or totally insane!

All in all, the book offers you guaranteed fun from cover to cover. One piece of advice though: Take the book slowly! More than an hour at a stretch will leave you dazed!

S P Suresh, Junior Research Fellow, The Institute of Mathematical Sciences, CIT Campus, Taramani, Chennai 600 113. Email: spsuresh@imsc.ernet.in

Electrostatics of Atoms and Molecules

G Naahari Sastry



Electrostatics of Atoms and Molecules
S R Gadre and R N Shirsat
Universities Press
2000, Rs.175.

In the last decade or so, in silico prediction of molecular properties have become economic means of achieving quick insights, and in some instances attractive alternatives to the experimental techniques. Modeling the drug-receptor and supramolecular interactions is one of the formidable challenges to modern computational approaches. Collaborative efforts among the biologists, physicists and chemists are essential in understanding the interactions between molecules, particularly biomolecules. Electrostatic interactions are the major contributors along with the van der Waals and dispersive interactions. The book, under review, is divided into four chapters and supplemented by seven appendices. The first chapter makes an unassuming beginning and gives a nice historical introduction along with the basic concepts. The second chapter deals with the experimental and theoretical techniques to obtain the molecular electrostatic potential (MESP), and beautifully illustrates the maps with the graphic visualization programs. Chapter 3 provides some genral results followed by some illustrative applications of MESP in diverse areas. I found that the monograph maintains a fine balance between rigor and application and gives a good exposition to the field of electrostatics and their utility in getting insights in diverse areas. The conventional quantum chemistry textbooks often truncate the treatment of electrostatics in general, and I do not find any other book of Indian origin on this topic at the same level. Thus, it would not be an exaggeration to state that this is the first attempt at a textbook or a monograph which thoroughly discusses the topic of electrostatics in our country.

The other nice feature of the book is the effective utilization of the appendix section. Quite a number of topics, which are of relevance, are dealt in more detail in the appendices, which should be particularly useful to the non-specialists and students. Appendix A, which gives some biographical notes of pioneering contributors in the field, makes interesting reading to everyone. This monograph could have had some more examples on the application of electrostatics in drug design, and docking studies. Obviously, it is impossible to cover all the fundamentals and applications of electrostatics for a book of this size. Thus, this book will be quite useful in providing the correct direction to anybody trying to apply electrostatics to solve the structural, mechanistic and reactivity problems in chemistry and biology. The encouraging point in this monograph is that, this would be of interest to people from various disciplines, such as physics, chemistry, biology, material science, etc. The students and teachers who are working in the area of computational chemistry, molecular modeling or X-ray crystallography should definitely benefit from