These are sensitive laboratories of physics in the low-energy domain in sharp contrast to the LHC which is at the extreme high energy limit. The review by Michael J. Ramsey-Musolf and Shelly A. Page is on the esoteric topic of Hadronic Parity Violation, which also features the difficulty of studying weak interaction properties in systems with strongly interacting constituents. In addition to reviewing the effective theories relevant to the system, the authors have also described certain intriguing experiments that will probe this system. On the other hand, the article by Gerald A. Miller, Allena K. Opper and Edward J. Stephenson looks at an exclusive strong interaction problem in their review article on Charge Symmetry Breaking and QCD, which is associated with the fact that the masses of the u- and d-quarks are somewhat different. This leads to some experimental signatures which have been seen recently for the first time, in the processes where a neutron and proton combine to form a deuteron in the final state along with the emission of a neutral pion, and the capture of one deuteron by another producing an alpha particle and a neutral pion.

There are three articles in the volume devoted to matter at extreme conditions: the first on (a) Results from the Relativistic Heavy Ion Collider (RHIC) by Berndt Mueller and James L. Nagle, and the closely related article on (b) Hydrodynamic Models for Heavy Ion Collisions by P. Huovinen and P. V. Ruuskanen, on (c) Dense Matter in Compact Stars by Dany Page and Sanjay Reddy. The collider RHIC at Brookhaven Laboratory was recently in the news due to the financial problems it faced in continuing its operations, but readers of the article by Mueller and Nagle can take heart at the achievements thus far, which include tests of the idea of a quark-gluon plasma, a state of matter which may have existed at the time of the big bang. Since the properties of the medium in collision cannot be treated *ab initio*, one resorts to modelling of the sort reviewed in the article by Huovinen and Ruuskanen. Indeed, at the LHC there will be further investigations of this type in the Pb–Pb collisions. The article by Page and Reddy, on the other hand, looks at matter in extreme conditions in an astrophysical setting, as in neutron stars. The article reviews the constraints on many significant models in light of recent observational information.

A fascinating tour of the history of the early Universe after the big bang through the presently acknowledged paradigm of inflation, and the associate phase transitions is presented in the article on Present Transitions in the Early and Phase Universe by D. Boyanovsky, H. J. de Vega and D. J. Schwarz. The authors point out that this study combines several traditional disciplines like cosmology, statistical mechanics and observational information to arrive at the comprehensive picture of the history of the Universe. An interesting discussion is presented on the testing of the theories at accelerators such as RHIC.

Two articles on neutrino physics include the first on Primordial Neutrinos by Steen Hannestad and on Neutrino Masses and New Physics by R. N. Mohapatra and A. Y. Smirnov. In the currently accepted picture of standard big bang cosmology, the neutrinos that would have been present in large numbers in that epoch would have 'decoupled' from matter and would have left an imprint on the cosmic microwave background radiation. Furthermore, one of the litmus tests of the scenario has always been the prediction for the abundance of light nuclei, which in turn constrain the nature of the primordial neutrinos. In the present article by Hannestad, the cosmological constraints on neutrino masses and properties are reviewed. The field of neutrino physics received a massive boost from the definitive finding of neutrino oscillations by the Sudbury Neutrino Observatory some years ago, heralding as it were, physics 'beyond the standard model'. A lot is now known about neutrino properties, which have also been reviewed recently in the pages of *Current Science* [Ananthanarayan, B. *et al.*, *Curr. Sci.*, 2006, **91**, 864]. The review of Mohapatra and Smirnov gives an up-to-date account of the status of this subject.

Two articles stand more or less on their own, the first on Physics of a Rare Isotope Accelerator (RIA) by D. F. Geesaman *et al.*, and on Searches for Astrophysical and Cosmological Axions by Stephen J. Asztalos *et al.* The RIA is a proposed facility to carry out experiments that will probe the issue of nuclear stability in an unprecedented manner. The implications are expected to be far reaching and will also provide tests of accepted paradigms of nuclear structure and stability. The article by Asztalos is a review on the subject that is captured in the title. Axions are particles that arise in a proposed solution to a problem known as the strong CP problem of the strong interactions. However, it is very difficult to find any real constraints on the masses and couplings of these particles which could virtually be anything. However, if present in the Universe they could have a crucial impact on its history during the big bang and afterwards, and also in the astrophysical setting as they could lead to unacceptably fast cooling of stars. The present article reviews the status of the field.

In summary, the present volume of reviews is a very useful handbook for the practitioner and the theorist. The extensive references provided are of immense value and the articles are an excellent archival source. It is a must for any library that serves researchers in the field of elementary particle physics especially to those who are in the interdisciplinary field of astroparticle physics.

In conclusion, I thank K. Shivaraj and A. Upadhyay for a careful reading of this review.

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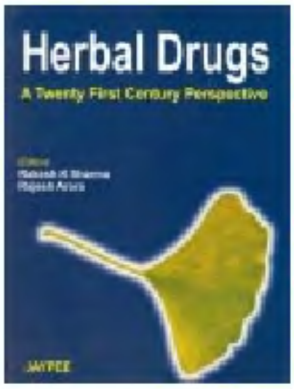

Herbal Drugs. Rakesh K. Sharma and Rajesh Arora (eds). Jaypee Brothers Medical Publishers (P) Ltd., B-3, EMCA House, 23/23B, Ansari Road, Daryaganj, New Delhi 110 002. 2006. 666 pp. Price: Rs 695.

The use of herbal drugs is synonymous with traditional systems of medicine. Most often, herbal drugs are prescribed as preparations that contain more than

one plant ingredient, the combination and method of preparation of which renders it effective for a particular malady. Traditional medicine is often viewed as an empirical system and thus has no place in a rational world. Modern 'medicine' or the so-called allopathic drugs on the other hand, demands knowledge of the chemistry and pharmacology of the drug constituents. This knowledge must be established through rigorous testing and analysis. The use of herbal drugs as alternatives to 'allopathic' medicines for a large number of ailments is gaining ground, particularly for common ailments. This rise in the use of herbal drugs is accompanied by a clamour for pharmacological data authenticating therapeutic claims as well as establishment of manufacturing protocols for the various formulations. Natural products chemistry is seen as the way to establish the chemical identity of active constituent(s) and manufacturing quality control standard through the application of modern analytical chemistry methods. Thus, herbal drugs, traditional systems of medicine and natural products chemistry and may be viewed as three related aspects of a common health goal, i.e. to provide safe, efficacious and cost effective treatment.

This book attempts to unite the various subjects or disciplines discussed above and many more related topics in one voluminous effort. The eight sections cover diverse topics such as chemistry and pharmacology of herbal drug formulations or individual plants, biodiversity of plant species with particular emphasis on the plant species of the Northeastern and Himalayan regions of the country, new drug discovery, use of herbal formulations or phytochemicals against radiation damage, the role of biotechnology for improved production and yields of different phytoconstituents, etc. Also included are sections on linking traditional medicine with modern medicine as well as a section on patents and intellectual property rights.

The editors have claimed that the book is intended for researchers, academicians, students, pharmaceutical companies and others interested in the area of herbal drugs research. Inspite of their best efforts the book falls abysmally short in content and editorial and publication standards. It appears to be a collection of thoughts from a number of contributors. Almost every chapter begins with hackneyed comments on the history and virtues of Ayurveda and the need to inject modern analytical methods in order to understand, probe, exploit or improve this system of medicine. This was already introduced in the Preface and could have been added as an editorial note at the beginning of the book. Another point is the repetition of content. Chromatographic techniques are elaborated upon in chapters 4, 7, 8 and 9. Chapters 15 and 16 in Section 3 (New Drug Discovery) deal with the role of natural products in new drug discovery and the role of natural product chemistry in drug discovery respectively. Chapter 16 is a near identical repeat of chapter 15, the chemical compounds listed are identical except for the fact that in chapter 15, the names of the compounds are given below each structure, whereas in chapter 16 they appear in the text. Both chapters only list well-known chemicals or drugs. In essence it provides no new information to the researcher, academician or student. The authors of chapter 16 have attempted to discuss some elaborate automated chromatographic (separation) techniques using the extracts of *Hippophae rhamnoides* as an example. They have managed to isolate and determine the structures of sucrose and gallic acid. In presenting the structures they could have referenced earlier identification and structure determination of these molecules.

In atleast two instances, different structures have been depicted for the same molecule (Chapter 8, azadiradione, pages 75 and 76) and digitoxin (Chapter 15, page 145 and Chapter 16, page 150). The list of errors is vast and touches several aspects of presentation of scientific material, from facts to language to content. A glaring example of editorial standards of the book is reflected in a schematic figure (Plate 1, Chapter 11, Figure 11.1) which even contains the Adobe PDF logo.

The content in the chapter 'Herbal Drugs Food – A Perspective' (Chapter 37) leaves the reader in a state of helplessness. Food items (mainly fruits and vegetables) and their associated health benefits are monotonously listed and then without warning the theme switches into a therapeutic mode and lists plants that may be beneficial for particular ailments. In this chapter, two paragraphs are accompanied by references while the rest of the chapter contains material without references. One wonders where this information was obtained. Added to this is the fact that several plants listed in this chapter are not even indigenous to India. One can well imagine the bewilderment of a student who comes across names of plants such as 'sangre de grado' or 'Yerba mate'. Incidentally both preparations are made from plants that grow in South America! The botanical names of these plants are *Croton lechleri* and *Ilex paraguariensis* respectively. Is such a listing really necessary? If yes, then at the least, plants that grow in the Indian subcontinent, with equivalent properties could be listed for the student to be enthused. Similar lists of plants and their associated uses appear in almost every chapter.

However, one redeeming factor in this book is an interesting chapter on the application of a functional genomics approach towards understanding biosynthesis of alkaloids, using *Catharanthus roseus* as an example. Details of such methodology would be of immense help to students.

Overall, this book is tedious to read and offers no insight into the research of herbal drugs in the 21st century or earlier.

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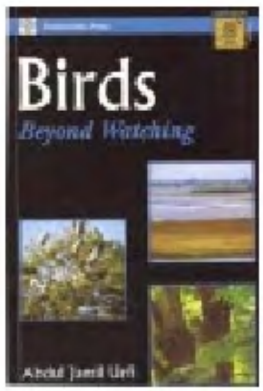

Birds: Beyond Watching. Abdul Jamil Urfi. Universities Press (India) Pvt. Ltd., 3-5-819 Hyderguda, Hyderabad 500 029. 2004. 214 pp. Price: Rs 285.

This is a book that has surely been long awaited by an increasing number of birdwatchers and nature-lovers, particularly with the advent of wildlife-oriented television channels and birding lists on the Internet. The book is definitely one-of-its-kind, providing a very nice mix of science, natural history and possible conservation action.