
BOOK REVIEWS

Annual Review of Earth and Planetary Sciences, Vol. 15, 1987, pp. 614, (eds) G. W. Wetherill, A. L. Albee and F. G. Stehli, (Published by Annual Reviews Inc., 4139, El Camino Way, Palo Alto, California 94306, USA) Price USA \$ 44; Elsewhere \$ 47.

The current annual number maintains the exacting standards of its predecessors which are avidly read by geoscientists seeking up-to-date reviews of topics of their special interest. There are 20 papers in this volume covering a wide spectrum of earth and planetary sciences. The introductory article is the customary biography of a renowned scientist—this time R. Revelle who recounts his memorable days as an oceanographer.

This volume contains several papers dealing with different aspects of plate tectonics. B. R. Rosendahl provides a fascinating summary of continental rifts with special reference to the classical East African examples. Well-conceived diagrams and seismic profiles richly supplement the highly readable text. H. J. Neugebauer discusses various models of lithospheric thinning, usually associated with igneous activity as well as structures like dome, rift and basin in a genetic sequence. Apart from these papers on extensional regimes, there are two papers related to plate convergent zones. A. M. Celal Sengor vividly describes the evolution of Alpine-Himalayan mountain chain in terms of an orogenic collage resulting from collision, along with the associated complexities of suture-parallel strike-slip faulting. R. D. Hatcher, Jr gives an interesting account of the tectonics of parts of Appalachian orogen, which involve the processes of accretion of suspect and exotic terranes together with terrane collision completing the Wilson Cycle.

Two articles on oceanic regimes include C. G. A. Harrison's scholarly account of the origin of magnetic stripes on the oceanfloor and W. E. Seyfried, Jr.'s succinct summary of hydrothermal alteration processes in the submarine geothermal system at mid-ocean ridges in terms of constraints imposed by experimental and theoretical data.

There is a brief account by R. G. Gordon of polar wandering and its measurement by palaeomagnetic data, particularly by the testable hotspot model. The article outlines the causes of polar wandering and directions of future research. D. I. Gough and W. I. Gough discuss the state of stress in the top 10–15 km

of the earth's crust and its significance for finding patterns of tractions acting on the plates. C. H. Thurber and K. Aki emphasize the importance of 3-D seismic imaging in mapping mantle convection, explaining the geoid, revealing the structure of subduction zones and hot spots as well as deciphering local subsurface geology. C. J. Young and T. Lay analyse the seismological investigations into the core-mantle boundary (CMB) and plead for a better resolution of its seismic velocity structure in order to reach a consensus. L. Wilson, H. Pinkerton and R. Macdonald provide a bird's eye view of the physical processes in volcanic eruptions such as melt formation, diapirism, magma chamber evolution, dyke propagation, magma motion, eruptive styles and pyroclast dispersion.

R. A. F. Grieve gives a state-of-the-art account of terrestrial impact craters covering their basic features, formational processes, impact record and bearing on terrestrial evolution. The impact hypothesis for the origin of the moon is ably discussed by D. J. Stevenson. R. G. Prinn and B. Fegley, Jr furnish a critical comparison of the atmospheres of Venus, Earth and Mars highlighting the common aspects of their meteorology, chemistry and atmospheric evolution in contrast to the unique role of biota in determining and altering the Earth's atmosphere. M. Schidlowski gives a detailed account of the stable carbon isotopic studies on terrestrial rocks and concludes that the biological control of the geochemical carbon cycle was established very early in the geological past and was fully operative by the time of formation of the Earth's oldest sediments. R. P. Philp and C. A. Lewis describe the organic geochemistry of biomarkers i.e. organic compounds in a geological sample that are related to a biological source. These studies are very important for basin modelling with special reference to oil potential. R. C. Surdam and L. J. Crossey give a masterly analysis of clastic diagenesis and its modelling techniques which have an important bearing on the search for hydrocarbons.

S. R. Bohlen and D. H. Lindsley give a short summary of geothermobarometry touching upon univariant and multivariant thermobarometers, exchange thermometers, solvus thermobarometry and the concept of saturation surfaces as useful thermometers. Individual thermobarometric schemes could have been discussed in greater detail in the paper so that it is useful to wider section of readers. This

book review ends with a borderline subject viz., geoarchaeology by G. Rapp, Jr. This paper lays stress on archaeological sediments and their provenance. On the whole this Annual Review makes wholesome reading and is a valuable reference material.

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A Treatise on Phytonematology by P. Parvatha Reddy. (Published by Agricole Publishing Academy, 208 Shopping Complex, Defence Colony Flyover, New Delhi 110 024), 1987, pp. XIV + 381, Price: India Rs. 250.00; Elsewhere U.S. \$ 50.00.

This revised and greatly expanded treatise reflects the demand and advances made since the appearance of first edition of *Plant Nematology* published in 1983. The present volume furnishes laudable account of nearly all aspects and comprehensive view to multidisciplinary subject of phytonematology—an area in which there has been a rapid increase in interest and knowledge. The book has been categorized into six major parts. The first part concerns with importance of phytonematodes in agriculture, their historical retrospect, development of nematology, useful biochemical techniques for the detection and extraction of nematodes from soil, plant material and other substrates. A detailed description of morphology and anatomy of nematodes has been documented in part 2 which also contains the outline of nematode classification up to generic level. Important monographic references for the exploitation in identification of nematodes up to specific level is an attractive feature. Part 3 offers some important aspects of biology, physiology and ecology of nematodes and accentuates the influence of array factors including soil, climate and environment on nematode population dynamics. The subsequent part has been subjected to feeding, symptomatology of parasitic nematodes, their physiologic races affecting the over and underground parts of the plants which have been depicted in few illustrations. An effort has also been made to undertake a brief account of histopathology of plants associated with infestations of selected nematodes. A unique feature of the book is that special attention has been drawn to the role of nematodes in inducing complex plant diseases in association with other pathogens

and micro-organisms such as fungi, bacteria and viruses. Of particular interest is the management of nematode diseases—an important concept contemporarily in terms of increase in yield has been attributed to part 5 by employing host parasite resistance, controlling and/or suppressing the nematode population by using quarantine, seed certification, cultural practices, biological, physical as well as chemical methods. The last part emphasizes on the diseases of economic significance incited by nematodes together with life cycle, host range as well as geographical distribution in respect of agrihorticultural, plantation and field crops.

A list of common names of nematodes, glossary, selected references complement this text. However, there are some printing errors which could have been easily eschewed.

This book is of considerable interest and I strongly feel that it is indispensable for students, teachers and other personnel who are engaged particularly in the study related to phytonematology. Dr. Reddy must be congratulated for this commendable and splendid accomplishment.

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Aluminium Technology '86, by T. Sheppard. (Published by The Institute of Metals, 1, Carlton House Terrace, London SW1Y 5DB). 1986, pp. 850. Price: UK £ 59.50; Overseas U.S. \$ 95.50.

This massive volume contains the proceedings of the International Conference on Aluminium Technology, London held in March 1986 to celebrate the centenary of the Hall-Heroult processes. The 106 papers span a wide spectrum of topics in aluminium technology from the primary production, casting, deformation, welding, corrosion, rapid solidification to advances in equipment and control.

Since commercial production of aluminium was first accomplished by the Hall-Heroult process in 1888, the annual world production of primary aluminium steadily increased to 10 million tons. Over the last decade there has not been a significant increase and it is expected that this current level will be maintained to 2000 and beyond. Aluminium is a light and stiff metal and is non-corrosive and finds many electrical and structural applications. With the invention of age hardening around the beginning of

this century, strong and ductile aluminium alloys could be produced. Alloy development has reached a stage of maturity.

In aerospace applications aluminium alloys face a stiff challenge. In response to this, metallurgists have come up with a number of new possibilities. These include aluminium-lithium alloys, rapidly solidified alloys, aluminium-metal matrix composites and aramid-aluminium laminates. The conference has dealt with these themes in an interesting fashion and the proceedings contain many valuable papers.

India has an abundant resource in aluminium ores and is strongly committed to the development of aluminium technology. Educational, industrial and research establishments concerned with aluminium are advised to add this volume to their library.

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NEWS

"SOYUZ TM-3" SOFTLANDS

Cosmonauts Yuri Romanenko, Alexander Alexandrov, and Anatoly Levchenko returned to Earth at 12.16, Moscow Time, on December 29, 1987 after successfully accomplishing a programme for scientific and technical research and experiments on board the orbital complex Mir.

The descent module of the Soyuz TM-3 spaceship landed 80 km away from the town of Arkalyk. The cosmonauts feel well.

Vladimir Titov and Musa Manarov continue work in orbit.

For the first time in history cosmonaut Yuri Romanenko made a 326-days-long space flight. Full change of the crew was effected during the uninterrupted functioning of the orbital research complex Mir.

The programme for work in orbit included astrophysical, geophysical and medico-biological research, engineering, technological and biotechnological experiments as well as assembly operations in the open space to install an experimental solarcell battery.

The crew was partially changed in the middle of the flight: Alexander Alexandrov took the place of flight engineer Alexander Laveikin and made a 160-day space flight.

A large amount of research was carried out under international cooperation programmes. The Soviet-Syrian crew worked on board the orbital complex for a week, performing experiments prepared by the scientists of the Soviet Union and Syria.

The addition of the scientific module Kvant to the orbital complex made it possible to implement an

extensive programme of astro-physical research with the use of the "Roentgen" orbital observatory created by the scientists of the Soviet Union, Britain, the Netherlands, the Federal Republic of Germany, and the European Space Agency as well as the "Glazar" ultra-violet telescope designed in the Soviet Union with the participation of Swiss specialists.

The telescopes of the Kvant module were the first in the world to record the X-ray radiation of the supernova in the large magellanic cloud.

In all, there were more than 500 sessions of research into various astro-physical objects. Two hundred and seventy photographic pictures of starry sky areas were taken by means of the "Glazar" ultra-violet telescope.

The presence on board of several technological installations made it possible to perform a large number of experiments on space study of materials with due regard for the results obtained in the previous flights.

Visual observations, photography and spectrometry of land and the world ocean area were regularly carried out under the programme of research into the natural resources of the Earth and the study of the environment.

Equipment, apparatus and expendable materials necessary for the ensurance of the cosmonauts' work were uninterruptedly delivered to the orbital complex Mir by "Progress" automatic cargo craft.

The state of the cosmonauts' health was continuously monitored during the flight. A series of disease-prevention measures enabled the mission