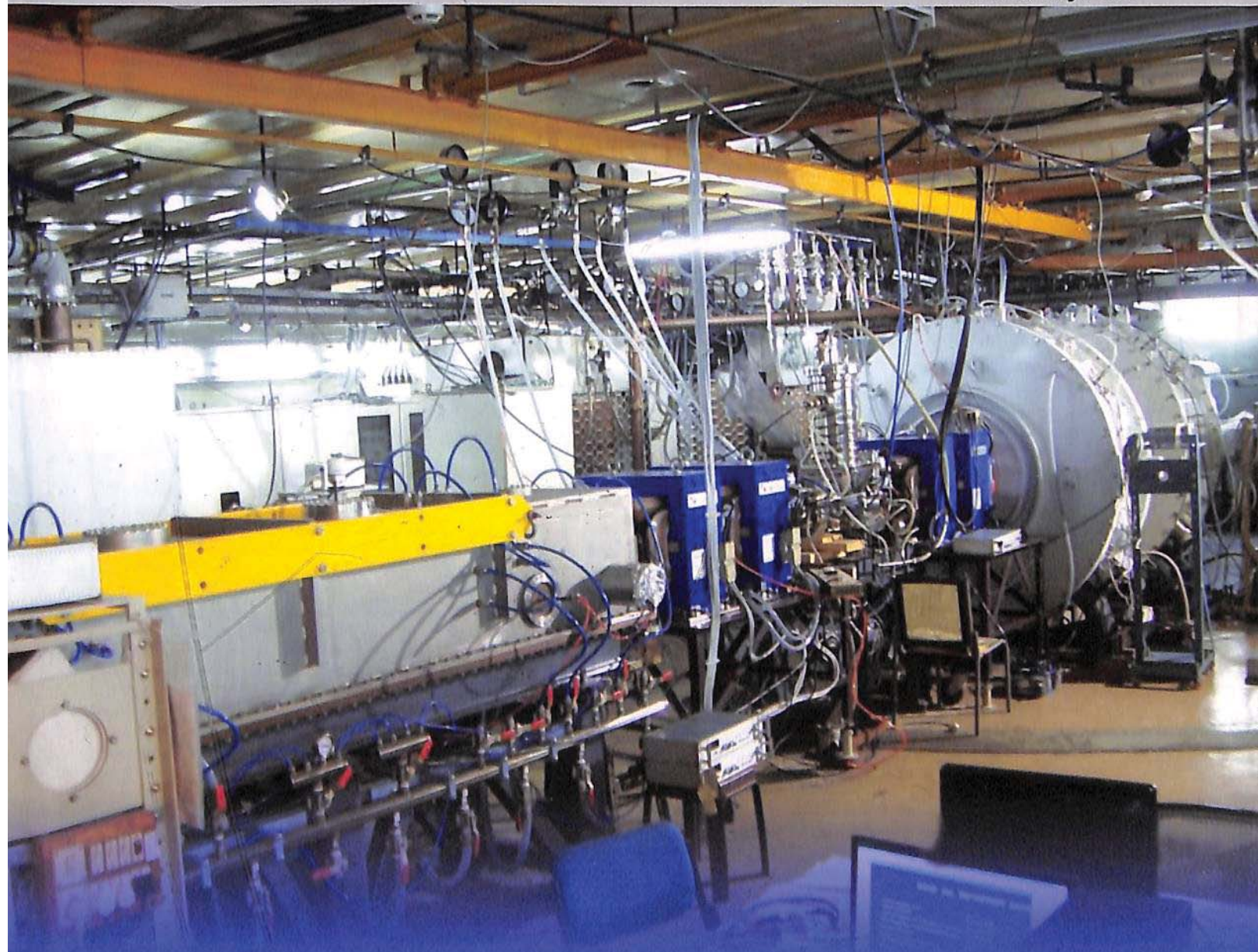


CURRENT SCIENCE

Volume 108 Number 1

10 January 2015



Physics and technology of rare ion beams

Biomolecular linkages in fragrant agarwood oil

Climate change effect on *Rhododendron arboreum* in K. Himalaya

CURRENT SCIENCE

Volume 108 Number 1

10 January 2015

6 In this issue

GUEST EDITORIAL

- 7 'Innovation' for affordable excellence
R. A. Mashelkar

CORRESPONDENCE

- 9 Beware of phony prophets who pretend to teach scientific writing, Sachi Sri Kantha
■ 9 U. R. Ananthamurthy, M. Vijayan ■ 10 New Ebola vaccine trial starts in humans – but how safe is it?, Debajit Borah, Vandana Singh, Amrita Kashyap Chaliha, Dhruvajyoti Gogoi and Nureidin Mohamedkassm ■ 10 Modi(the)ology in science, Rajanikanth Annamraju

NEWS

- 12 Solar thermal greenhouse, A. A. Murkute, Shashi Bala Singh and P. P. Singh ■ 13 Plant parasitic nematodes: a major stumbling block for successful crop cultivation under protected conditions in India, Mahendrakar Sreenivasa Rao, Rajappa Umamaheswari and Akshay Kumar Chakravarty

COMMENTARY

- 15 India and the SAARC satellite, P. J. Lavakare

SCIENTIFIC CORRESPONDENCE

- 17 A non-meat-based artificial diet and protocol for mass rearing of *Chrysomya megacephala* (Fab.) (Diptera: Calliphoridae), an important pollinator of mango, P. V. Rami Reddy, V. Varun Rajan and Abraham Verghese ■ 19 Prevention of malaria through forecast-based precision vector sanitation and exposure advisory: a conceptual and feasibility analysis, P. Goswami

GENERAL ARTICLES

- 22 Rare ion beams – the new road to understand the universe
Alok Chakrabarti, Vaishali Naik, Arup Bandyopadhyay and Rakesh Bhandari
- 30 Technology development of fast reactor fuel reprocessing in India
R. Natarajan and Baldev Raj
- 39 Scientific endeavours for natural resource management in India
N. K. Lenka, Sangeeta Lenka and A. K. Biswas
- 45 Palaeolinguistics and ancient Eurasian pulse crops
Aleksandar Mikić

RESEARCH ARTICLES

- 51 Isolation and characterization of a OsRap2.4A transcription factor and its expression in *Arabidopsis* for enhancing high salt and drought tolerance
Nguyen Duy Phuong and Pham Xuan Hoi
- 63 A simple metabolite profiling approach reveals critical biomolecular linkages in fragrant agarwood oil production from *Aquilaria malaccensis* – a traditional agro-based industry in North East India
Supriyo Sen, Narayan C. Talukdar and Mojibur Khan
- 72 Ecological and health risk assessment of metal in resuspended particles of urban street dust from an industrial city in China
Xue Xu, Xinwei Lu, Xiufeng Han and Ni Zhao





RESEARCH COMMUNICATIONS

- 80 **Oxyhalide disinfection by-products in packaged drinking water and their associated risk**
I. V. Saradhi, S. Sharma, P. Prathibha and G. G. Pandit
- 85 **Post-disaster assessment of impact of cyclone *Lehar* in South Andaman Island**
E. Yuvaraj, K. Dharanirajan, Saravanan and G. Narshimulu
- 90 **Application of fast Fourier transform in fluvial dynamics in the upper Brahmaputra valley, Assam**
Siddhartha Kumar Lahiri and Rajiv Sinha
- 96 **Can hydrocarbons in coastal sediments be related to terrestrial flux? A case study of Godavari river discharge (Bay of Bengal)**
Rayaprolu Kiran, V. V. J. Gopala Krishna, B. G. Naik, G. Mahalakshmi, R. Rengarajan, Aninda Mazumdar and Nittala S. Sarma
- 100 **Polarimetric classification of C-band SAR data for forest density characterization**
A. O. Varghese and A. K. Joshi
- 106 **Phenological events along the elevation gradient and effect of climate change on *Rhododendron arboreum* Sm. in Kumaun Himalaya**
Nandan Singh, Jeet Ram, Ashish Tewari and R. P. Yadav
- 111 **Flowering and fruiting phenology of some herbs, shrubs and undershrubs from Girnar Reserve Forest, Gujarat, India**
R. N. Nakar and B. A. Jadeja
- 118 **Estimate of primate density using distance sampling in the evergreen forests of the central Western Ghats, India**
Gajjala Bapureddy, Kumar Santhosh, Samidurai Jayakumar and Honnavalli Nagaraj Kumara

BOOK REVIEWS

- 124 **Dark Matter: An Introduction.** Debasish Majumdar, *reviewed by* B. Ananthanarayan
■ 125 **Ayurvedic Herbs in Healthy Ageing.** Sukh Dev and Sashi Prabha, *reviewed by* K. K. Bhutani
-



- ◀ COVER. A portion of radioactive ion beam facility at Variable Energy Cyclotron Centre, Kolkata, showing the radio frequency quadrupole and two IH linacs. See page 22.

Indexed in CURRENT CONTENTS/GEOTitles/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 2

25 January 2015

146 In this issue

GUEST EDITORIAL

- 147 Bibliometrics – problems and promises**
Gangan Prathap

CORRESPONDENCE

- 149 Global biodiversity hotspots in India: significant yet under studied, V. S. Chitale, M. D. Behera and P. S. Roy ■ 149 The nature of scientific collaboration, Gangan Prathap ■ 151 Forbidding invasive species – a way to attain sustainability of the coastal ecosystem, Himala Joshi and N. Marimuthu ■ 152 Dual burden of malnutrition and hidden hunger among tribal children of North East India, Mithun Sikdar**

NEWS

- 154 Ecology of plant–animal interactions: pollination, seed dispersal and tritrophic interactions, Palatty Allesh Sinu ■ 155 Reconstruction and rehabilitation of disaster-affected landscape of Kedar valley, Uttarakhand, R. K. Maikhuri, P. P. Dhyani and Annpurna Nautiyal**

RESEARCH NEWS

- 158 Fear finds its niche, Sandhya Rani**

IN CONVERSATION

- 160 Srivari Chandrasekhar, Sandhya Rani**

COMMENTARY

- 163 tSermang – a priceless gift to lackadaisical Ladakhis, Amjad Ali Abassi and Veenu Kaul ■ 165 What is scientific thinking? Two cases of problem-solving by some newcomers in science, Deepanwita Dasgupta and Alexander Levine**

SCIENTIFIC CORRESPONDENCE

- 168 Hypothesis of mechanism of thrombocytopenia in severe dengue, providing clues to better therapy to save lives, C. E. Eapen, Elwyn Elias, Ashish Goel and T. Jacob John**

GENERAL ARTICLES

- 170 Innovations in attracting the young to the pursuit of science**
K. P. Madhu, Gita Madhu and Vagish Jha
- 176 Publications in organic chemistry from Indian universities and laboratories in 2011–2013: analysis and some suggestions**
K. Nagaiah and G. Srimannarayana

SPECIAL SECTION: GEOCHEMISTRY

- 184 Proterozoic subduction-related and continental rift-zone mafic magmas from the Eastern Ghats Belt, SE India: geochemical characteristics and mantle sources**
K. Vijaya Kumar, K. Rathna and C. Leelanandam
- 198 Felsic granites vis-à-vis leucosomes from the Shyok–Darbuk section of the Shyok Suture Zone, eastern Ladakh, India: a geochemical study**
D. Rameshwar Rao and Megha M. Daga
- 205 Origin of the Mile Tilek Tuff, South Andaman: evidence from ⁴⁰Ar–³⁹Ar chronology and geochemistry**
Neeraj Awasthi, Jyotiranjana S. Ray and Kanchan Pande



- 211 **Biomarker signatures of Early Cretaceous coals of Kutch Basin, western India**
Swagata Paul and Suryendu Dutta
- 218 **Fertile farmlands in Cauvery delta: evolution through LGM**
Pramod Singh, M. G. Yadava, Malik Z. Ahmad, P. P. Mohapatra, A. H. Laskar, S. Doradla, J. Saravanavel and C. J. Kumanan
- 226 **Sources and fate of organic matter in suspended and bottom sediments of the Mandovi and Zuari estuaries, western India**
R. Shynu, V. Purnachandra Rao, V. V. S. S. Sarma, Pratima M. Kessarkar and R. Mani Murali
- 239 **Nitrogen uptake rates and *f*-ratios in the Equatorial and Southern Indian Ocean**
Satya Prakash, R. Ramesh, M. S. Sheshshayee, Rahul Mohan and M. Sudhakar

REVIEW ARTICLE

- 246 **Silicon isotopes: from cosmos to benthos**
Ramananda Chakrabarti

RESEARCH COMMUNICATIONS

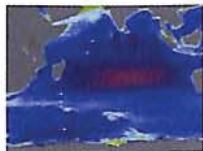
- 255 **Experimental investigations of supersonic turbulent flow over a compression ramp**
Wu Yu, Yi Shihe, He Lin, Chen Zhi and Zhu Yangzhu
- 260 **Prevalence of *Wheat dwarf India virus* in wheat in India**
Jitendra Kumar, Jitesh Kumar, Shashank Singh, Vishnu Shukla, Sudhir P. Singh and Rakesh Tulj
- 265 **Magnetic fabric studies of sandstone from Jhuran Formation (Kimmeridgian–Tithonian) of Jara dome, Kachchh Basin, northwest India**
V. Periasamy and M. Venkateshwarlu
- 273 **Probable source of rocks for millstones and cannon balls of Goa, India**
Abhijit S. Ambekar, D. N. Sridhar, S. K. Ray, T. Bhattacharyya, S. G. Anantwar, V. T. Sahu and M. S. Gaikwad

BOOK REVIEWS

- 283 **Annual Review of Earth and Planetary Sciences, 2014**, Raymond Jeanloz and Katherine H. Freeman (eds), *reviewed by* C. P. Rajendran ■ 285 **Physical Climatology** by William D. Sellers, *reviewed by* Ramesh Vellore, Milind Mujumdar and R. Krishnan

PERSONAL NEWS

- 286 **Hiralal Chaudhuri (1921–2014)**, A. P. Sharma and B. P. Mohanty ■ 287 **Brian F. C. Clark (1936–2014)**, Prashanth Suravajhala and Renuka Suravajhala
-



- ◀ **COVER.** Photomicrograph of sandstones from Jhuran Formation with ferruginous cement. See page 265.

Indexed in CURRENT CONTENTS/GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 3

10 February 2015

309 In this issue

GUEST EDITORIAL

310 Social dimensions of India's space programme
K. Kasturirangan and Madhura D. Joglekar

CORRESPONDENCE

313 Do we lack courage in research?, P. Chaddah ■ 313 Why Indians and not Chinese prefer USA for STEM?, Jaimini Sarkar ■ 314 Association of citrus bacterial canker pustules with leafminer (*Phyllocnistis citrella*) tunnels in Iran, M. R. Mirzaee

NEWS

316 Science and policy, Ranadhir Mukhopadhyay ■ 317 Geology of the Shillong Plateau and the Brahmaputra Valley, D. Mukhopadhyay

OPINION

320 Need for objective, quantitative and inclusive performance matrix for research design
P. Goswami

COMMENTARY

322 The future of mathematics publishing, Rajendra Bhatia

SCIENTIFIC CORRESPONDENCE

326 Applications of satellite derived meso-scale features and *in-situ* bycatch to understand sea turtle habitats along the Indian Coast, Dhyey Bhatpuria, H. U. Solanki, Sijo Varghese and Prakash Chauhan ■ 330 Occurrence of *Vertebraria indica* (Unger) Feistmantel, 1877 – an evidence for coal-forming vegetation in Kothagudem area, Godavari Graben, Telangana, Arun Joshi, Rajni Tewari, Deepa Agnihotri, S. S. K. Pillai and R. K. Jain

GENERAL ARTICLE

334 Financial reporting and mimetic theory for small and medium enterprises
Adela Deaconu and Anuta Buiga

REVIEW ARTICLES

341 Raman and mid-infrared spectroscopic imaging: applications and advancements
Rekha Gautam, Ashok Samuel, Sanchita Sil, Deepika Chaturvedi, Abhaya Dutta, Freck Ariese and Siva Umapathy

357 Success factors of public funded R&D projects
D. S. Nagesh and Sam Thomas

RESEARCH ARTICLES

364 Interaction of glycyrrhizin with human haemoglobin
Rajarshi Sil, Subhrojit Sen and Abhay Sankar Chakraborti

372 Self-extinguishable ligno-cellulosic fabric using banana pseudostem sap
S. Basak, Kartick K. Samanta, S. K. Chattopadhyay and R. Narkar,

384 X-ray diffraction studies of some structurally modified Indian coals and their correlation with petrographic parameters
Prabal Boral, Atul K. Varma and Sudip Maity

395 Detecting appropriate groundwater-level trends for safe groundwater development
Rahul Gokhale and Milind Sohoni



Handwritten signature: *Samanta*
Date: 8/6/15

RESEARCH COMMUNICATIONS

- 405 **Surface current and wave measurement during cyclone *Phailin* by high frequency radars along the Indian coast**
Manu John, Basanta Kumar Jena and K. M. Sivakholundu
- 409 **Active channel systems in the middle Indus fan: results from high-resolution bathymetry surveys**
Ravi Mishra, D. K. Pandey, P. Ramesh and Shipboard Scientific Party SK-306
- 413 **Application of nonlinear geostatistical indicator kriging in lithological categorization of an iron ore deposit**
V. Kameshwara Rao and A. C. Narayana
- 422 **Chip size characterization for selecting optimum production parameters of surface miner operating in a coal mine**
A. Prakash, V. M. S. R. Murthy and K. B. Singh
- 427 **Delineating coal seams and establishing water tightness by electrical resistivity imaging**
Ch. Subba Rao, M. Majumder, J. Roy, M. S. Chaudhari and R. S. Ramteke
- 434 **High mobility of aluminium in Gomati River Basin: implications to human health**
Dharmendra Kumar Jigyasu, Rohit Kuvar, Nupur Srivastava, Sandeep Singh, Indra Bir Singh and Munendra Singh
- 438 **ERRATA: Oxyhalide disinfection by-products in packaged drinking water and their associated risk**
I. V. Saradhi, S. Sharma, P. Prathibha and G. G. Pandit [*Curr. Sci.*, 2015, **108**, 80–85]

BOOK REVIEWS

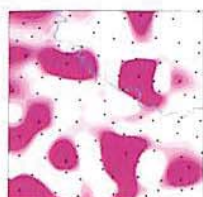
- 439 **Mathematics for the Life Sciences**, Erin N. Bodine, Suzanne Lenhart and Louis J. Gross, reviewed by S. K. Sikdar ■ 440 **Mathematical Physics** by P. K. Chattopadhyay, reviewed by S. Chaturvedi ■ 441 **Life and Work of Visionary Chemists** by Gopalpur Nagendrappa, reviewed by Aditi Deo and Anirban Hazra

PERSONAL NEWS

- 444 **B. M. Udgaonkar (1927–2014)**, D. P. Roy; Arvind Kumar

ACADEMY NEWS

- 447 **Indian Academy of Sciences elects new Fellows – 2015**



- ◀ **COVER.** Molecular docking of Hb and glycyrrhizin interaction: Binding site of glycyrrhizin within Hb molecule. See page 364.

Indexed in CURRENT CONTENTS/GEOTBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 4

25 February 2015

470 In this issue

GUEST EDITORIAL

- 471 The 'historic' storm at the Mumbai Science Congress**
Roddam Narasimha
-

CORRESPONDENCE

- 473 Early workings and modern science: some reactions to current happenings, T. V. Ramakrishnan ■ 473 Good fences make good neighbours, D. Balasubramanian ■ 474 The annual science farce, P. Tauro and A. S. Rao ■ 474 The missing 'crown' of India, K. L. Chaudhary**
-

NEWS

- 476 Ayurvedic treatment and modern medicine, P. L. T. Girija, G. S. Savithri, Rama Jayasundar, G. G. Gangadharan, N. Nagashayana and S. Yashonath ■ 479 Scholarly publishing, Debosree Ghosh ■ 480 Strategic environmental assessment, Jagdish Chandra Kuniyal, Sarla Shashni, Amit Kumar, Nidhi Kanwar, Bhim Chand, R. C. Sundriyal and Pitamber Prasad Dhyani**
-

COMMENTARY

- 482 Controversies surrounding coumarin in cassia: the good, the bad and the not so ugly**
R. Dinesh, N. K. Leela, T. John Zachariah and M. Anandaraj
-

GENERAL ARTICLE

- 485 Groundwater depletion in Central Punjab: pattern, access and adaptations**
Satvir Kaur and Kamal Vatta
-

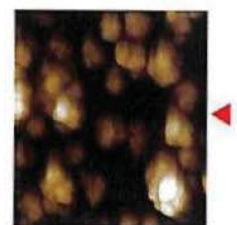
SPECIAL SECTION: LOW ENERGY NUCLEAR REACTIONS

- 491 Preface**
M. Srinivasan and A. Meulenberg
- 495 Cold fusion: comments on the state of scientific proof**
Michael C. H. McKubre
- 499 Extensions to physics: what cold fusion teaches**
A. Meulenberg
- 507 Phonon models for anomalies in condensed matter nuclear science**
Peter L. Hagelstein and Irfan U. Chaudhary
- 514 Development status of condensed cluster fusion theory**
Akito Takahashi
- 516 Model of low energy nuclear reactions in a solid matrix with defects**
K. P. Sinha
- 519 Selective resonant tunnelling – turn the hydrogen-storage material into energetic material**
C. L. Liang, Z. M. Dong and X. Z. Li
- 524 Coherent correlated states of interacting particles – the possible key to paradoxes and features of LENR**
Vladimir I. Vysotskii and Mykhaylo V. Vysotskyy
- 531 How the explanation of LENR can be made consistent with observed behaviour and natural laws**
Edmund Storms
- 535 Introduction to the main experimental findings of the LENR field**
Edmund Storms



- 540 **Review of materials science for studying the Fleischmann and Pons effect**
V. Violante, E. Castagna, S. Lecci, F. Sarto, M. Sansovini, A. Torre, A. La Gatta, R. Duncan, G. Hubler, A. El Boher, O. Aziz, D. Pease, D. Knies and M. McKubre

- 559 **Highly reproducible LENR experiments using dual laser stimulation**
Dennis Letts



- 562 **Sidney Kimmel Institute for Nuclear Renaissance**

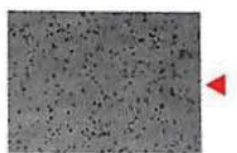
G. K. Hubler, A. El-Boher, O. Azizi, D. Pease, J. H. He, W. Isaacson, S. Gangopadhyay and V. Violante

- 565 **Progress towards understanding anomalous heat effect in metal deuterides**
O. Azizi, A. El-Boher, J. H. He, G. K. Hubler, D. Pease, W. Isaacson, V. Violante and S. Gangopadhyay

- 574 **Replicable cold fusion experiment: heat/helium ratio**
Abd ul-Rahman Lomax

- 578 **Observation of radio frequency emissions from electrochemical loading experiments**
D. A. Kidwell, D. D. Dominguez, K. S. Grabowski and L. F. DeChiaro Jr

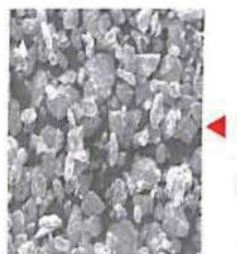
- 582 **Condensed matter nuclear reactions with metal particles in gases**
Dennis Cravens, Mitchell R. Swartz and Brian Ahern



- 585 **Use of CR-39 detectors to determine the branching ratio in Pd/D co-deposition**
P. A. Mosier-Boss, L. P. Forsley, A. S. Roussetski, A. G. Lipson, F. Tanzella, E. I. Saunin, M. McKubre, B. Earle and D. Zhou

- 589 **Brief summary of latest experimental results with a mass-flow calorimetry system for anomalous heat effect of nano-composite metals under D(H)-gas charging**
A. Kitamura, A. Takahashi, R. Seto, Y. Fujita, A. Taniike and Y. Furuyama

- 594 **Condensed matter nuclear science research status in China**
Z. M. Dong, C. L. Liang and X. Z. Li



- 595 **Dry, preloaded NANOR[®]-type CF/LANR components**
Mitchell R. Swartz, Gayle M. Verner, Jeffrey W. Tolleson and Peter L. Hagelstein

- 601 **Directional X-ray and gamma emission in experiments in condensed matter nuclear science**
Peter L. Hagelstein

- 608 **Observation and investigation of anomalous X-ray and thermal effects of cavitation**
V. I. Vysotskii, A. A. Kornilova and A. O. Vasilenko

- 614 **Martin Fleischmann Memorial Project status review**
Mathieu Valat, Ryan Hunt and Bob Greenyer



- 619 **Observation of neutrons and tritium in the early BARC cold fusion experiments**
Mahadeva Srinivasan

- 624 **Introduction to isotopic shifts and transmutations observed in LENR experiments**
Mahadeva Srinivasan

- 628 **Transmutation reactions induced by deuterium permeation through nano-structured palladium multilayer thin film**
Yasuhiro Iwamura, Takehiko Itoh and Shigenori Tsuruga

- 633 **Biological transmutations**
Jean-Paul Biberian

- 636 **Microbial transmutation of Cs-137 and LENR in growing biological systems**
V. I. Vysotskii and A. A. Kornilova

- 641 **Energy gains from lattice-enabled nuclear reactions**
David J. Nagel



- 646 **Lattice-enabled nuclear reactions in the nickel and hydrogen gas system**
David J. Nagel

- 653 **Summary report: 'Introduction to Cold Fusion' – IAP course at the Massachusetts Institute of Technology, USA**
Gayle Verner, Mitchell Swartz and Peter Hagelstein

- 655 **Status of cold fusion research in Japan**
Akira Kitamura
- 656 **Condensed matter nuclear reaction products observed in Pd/D co-deposition experiments**
P. A. Mosier-Boss, L. P. Forsley, F. E. Gordon, D. Letts, D. Cravens, M. H. Miles, M. Swartz, J. Dash, F. Tanzella, P. Hagelstein, M. McKubre and J. Bao

REVIEW ARTICLE

- 660 **Flyrock in surface mine blasting: understanding the basics to develop a predictive regime**
Avtar K. Raina, V. M. S. R. Murthy and Abhay K. Soni

RESEARCH ARTICLES

- 666 **Aerosol optical properties over marine and continental sites of India during pre-monsoon season**
Piyush Patel and A. K. Shukla
- 677 **Contribution of sewage treatment to pollution abatement of urban streams**
Priyanka Jamwal, T. Md. Zuhail, Praveen Raje Urs, Veena Srinivasan and Sharachchandra Lele

RESEARCH COMMUNICATIONS

- 686 ***In silico* prediction of *Escherichia coli* metabolic engineering capabilities for 1-butanol production**
Bashir Sajo Mienda, Mohd Shahir Shamsir, Faezah Mohd Salleh and Rosli Md. Illias
- 694 **Morphometric analysis of Barren volcanic base and associated tectonic elements in the Andaman fore-arc sub-basin**
Saju Varghese and G. Nagendran
- 699 **Comparative study of soil profiles developed on metavolcanic (basaltic) rocks in two different watersheds of Garhwal Himalaya**
S. Vyshnavi, R. Islam and Y. P. Sundriyal
- 708 **Anisotropy of magnetic susceptibility of earthquake-affected soft sediments: example from Ther village, Latur, Maharashtra, India**
B. V. Lakshmi, K. V. V. Satyanarayana, N. Basavaiah and Praveen Gawali
- 713 **Geochemistry of the unusual mafic intrusions in Betul Fold Belt, Central India: implications for Ni-Cu-Au-PGE metallogeny**
D. V. Subba Rao, M. Satyanarayanan, D. Srinivasa Sarma, K. S. V. Subramanyam, K. Venkateswarlu and M. Hanuma Prasad
- 723 **Equivalent permeability model for sealing evaluation of natural gas storage cavern in bedded rock salt**
Tongtao Wang, Chunhe Yang, Xiangzhen Yan, Hongling Ma, Xilin Shi and J. J. K. Daemen

BOOK REVIEWS

- 730 **Know Your Heart – The Hidden Links Between Your Body and the Politics of the State** by Dinesh C. Sharma, *reviewed by* V. Raman Kutty ■ 731 **A Petrographic Atlas of an Ophiolite: An Example from the Eastern India-Asia Collision Zone** by Naresh Chandra Ghose, Nilanjan Chatterjee and Fareeduddin, *reviewed by* Rajkumar Ghosh

PERSONAL NEWS

- 732 **Vasant R. Gowariker (1933–2015)**, Rajaram Nagappa
- 734 **Publications received – 2014**



◀ COVER. Autoradiograph of Ti anode of a plasma focus device after several discharge shots. See page 619.

Indexed in CURRENT CONTENTS/ GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 5

10 March 2015



758 In this issue

GUEST EDITORIAL

759 United Nations Climate Change Conference COP 20 at Lima concluded: what next?
S. K. Satheesh

CORRESPONDENCE

761 Change in near-surface wind velocity: what implications will it have on ecosystem and agriculture?, Debasish Chakraborty, Saurav Saha and R. K. Singh ■ 762 Bamboo and its role in climate change, A. Thokchom and P. S. Yadava ■ 763 Seabuckthorn – the natural soil fertility enhancer, Sonam Tamchos and Veenu Kaul ■ 764 Increasing hydrological hazards in the Himalayas: defence lies in integrated scientific preparedness, H. S. Saini, N. C. Pant, Ravish Lal and S. A. I. Mujtaba ■ 766 Ancient Indian astronomy, Rajesh Kochhar; Response by C. K. Ghosh

NEWS

767 Designed to cope with drought, Ipsita Herlekar ■ 767 Unlocking the past, Sujay Bandyopadhyay and Sourav Mukhopadhyay ■ 769 Connecting researchers in the Himalaya – institutionalizing a mechanism of active and sustained interaction, Ranbeer S. Rawal, Rajesh Joshi, Indra D. Bhatt, Subrat Sharma, Ranjan Joshi, Vasudha Agnihotri, K. C. Sekar and P. P. Dhyani ■ 770 MP-TRACS crops, P. Goswami and K. V. Ramesh

IN CONVERSATION

772 Shubha Tole, Ipsita Herlekar

OPINION

775 Microbial pathogens – an Indian platform for structure-based inhibitor design, M. Vijayan ■ 777 Is ‘compiler construction’ a dead subject?, Pinaki Chakraborty

COMMENTARY

779 ‘Little minds dreaming big science’: are we really promoting ‘children gifted in STEM’ in India?, Anitha Kurup, Ajay Chandra and V. V. Binoy

SCIENTIFIC CORRESPONDENCE

782 *Plectranthus vettiveroides* – a least known vetiver on the verge of extinction, R. Murugan, V. Sriramavaratharajan and M. Ayyanar ■ 784 Possibility of using isotopic composition of ground-level vapour for monitoring arrival and withdrawal of southwest monsoon, Gopal Krishan, M. S. Rao, Bhishm Kumar and C. P. Kumar

NATIONAL LABS: RESEARCH HIGHLIGHTS 2014

787 Realization of single-terminated nano step-and-terrace-like surface of SrTiO₃ single crystals: Institute of Nano Science and Technology, Mohali
Bhanu Prakash and S. Chakraverty

789 Recent advances in the development of low-dimensional materials for electrochemical applications: CECRI, Karaikudi
Subbiah Alwarappan and Vijayamohan K. Pillai

792 National Aerospace Laboratories, Bengaluru
Shyam Chetty

797 Birbal Sahni Institute of Palaeobotany, Lucknow
Sunil Bajpai

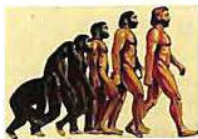


800 Central Road Research Institute, New Delhi
S. Gangopadhyay and U. K. Guru Vittal

GENERAL ARTICLES

804 Influence analysis of media supervision in corporate governance
Weida He, Rong Hao, Chuan Zhang and Fatima Zahra Ainou

813 The Indian economic miracle and the commercial and cultural–scientific relations with Romania
Ionel Bostan



819 Natural and controlled symmetry breaking analyses in biological systems
Lalit Prakash Saxena

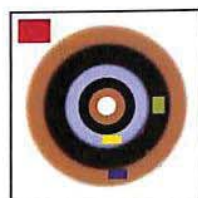
SPECIAL SECTION: HYPERSPECTRAL REMOTE SENSING

825 Preface
Ranganath Navalgund



826 Advances in spaceborne hyperspectral imaging systems
K. Ajay Kumar, Nitesh Thapa and Saji A. Kuriakose

833 Hyperspectral image processing and analysis
B. Krishna Mohan and Alok Porwal



842 Algorithms to improve spectral discrimination from Indian hyperspectral sensors data
A. Senthil Kumar, V. Keerthi, V. K. Dadhwal and A. S. Kiran Kumar

848 Hyperspectral remote sensing of agriculture
R. N. Sahoo, S. S. Ray and K. R. Manjunath

860 Hyperspectral remote sensing: opportunities, status and challenges for rapid soil assessment in India

B. S. Das, M. C. Sarathjith, P. Santra, R. N. Sahoo, R. Srivastava, A. Routray and S. S. Ray



869 Monitoring of forest cover in India: imaging spectroscopy perspective
N. S. R. Krishnappa, Binal Christian, Dhaval Vyas, Manjit Saini, Nikita Joshi, K. R. Manjunath, Tanumi Kumar, Hitendra Padalia, Rajee George and S. P. S. Kushwaha

879 Hyperspectral remote sensing and geological applications
D. Ramakrishnan and Rishikesh Bharti

892 Snow and glacier investigations using hyperspectral data in the Himalaya
H. S. Negi, Chander Shekhar and S. K. Singh

903 Simulating the effects of inelastic scattering on upwelling radiance in coastal and inland waters: implications for hyperspectral remote sensing

J. Vigneshwaran, P. Shanmugam and E. A. Gokul



915 Hyperspectral remote sensing of planetary surfaces: an insight into composition of inner planets and small bodies in the solar system

Prakash Chauhan, Prabhjot Kaur, N. Srivastava, Rishitosh K. Sinha, Nirmala Jain and S. V. S. Murty

RESEARCH ARTICLES

925 Low-voltage producing microbial fuel cell constructs using biofilm-forming marine bacteria
Supriya Kumari, Neelam Mangwani and Surajit Das

933 An evaluation based on highly cited publications in Taiwan
Kun-Yang Chuang and Yuh-Shan Ho



942 Snow depth estimation in the Indian Himalaya using multi-channel passive microwave radiometer

K. K. Singh, A. Kumar, A. V. Kulkarni, P. Datt, S. K. Dewali, V. Kumar and R. Chauhan

RESEARCH COMMUNICATIONS

954 Comparison of spectral characteristics between EO-1 ALI and IRS-P6 LISS-III imagery
Xuehong Zhang and Qingjiu Tian



- 960 **Climate change impact on design and costing of soil and water conservation structures in watersheds**
B. Krishna Rao, R. S. Kurothe, P. K. Mishra, Gopal Kumar and V. C. Pande.
- 966 **Sea-level-rise trends off the Indian coasts during the last two decades**
A. S. Unnikrishnan, A. G. Nidheesh and M. Lengaigne
- 971 **Distribution and molecular characterization of *Wolbachia* endosymbionts in *odonata* (insecta) from Central India by multigene approach**
Rahul C. Salunkhe, Dhiraj P. Dhotre, Bipinchandra K. Salunke, Vikas S. Patil, Vaibhav Mahale, Raymond J. Andrew, Milind S. Patole, Ketan P. Narkhede and Yogesh S. Shouche
- 979 **Recycling and treatment of herbal pharmaceutical wastewater using *Scenedesmus quadricuada***
Atul P. Vanerkar, Abhay B. Fulke, Satish K. Lokhande, Manisha D. Giripunje and Shanta Satyanarayan
- 984 **Hydromorphic soils of Tripura: their pedogenesis and characteristics**
S. K. Gangopadhyay, T. Bhattacharyya and Dipak Sarkar

BOOK REVIEW

- 994 **Scarred Communities: Psychosocial Impact of Man-made and Natural Disasters on Sri Lankan Society** by Daya Somasundaram, *reviewed by* R. Srinivasa Murthy

PERSONAL NEWS

- 996 **C. SivaRaman (1923–2014), M. V. Deshpande** ■ **996 Narahari Waman Gokhale (1931–2014), G. V. Hegde**

HISTORICAL NOTES

- 998 **The atomic hypothesis, S. K. Bose**
-



- ◀ **COVER.** Hyperspectral cube acquired using Moon Mineralogical Mapper flown onboard Chandrayaan-1 showing Aristarchus Crater on Moon. See special section.

The editor thanks Prof. R. Navalgund, ISRO Headquarters, Antariksh Bhavan, Bengaluru for agreeing to be guest editor for the special section.

Indexed in CURRENT CONTENTS/GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 6

25 March 2015

1026 In this issue

GUEST EDITORIAL

- 1027 Why not be an early-bird researcher?**
Ravindra P. Nettimi, Madhur Mangalam and Mewa Singh

CORRESPONDENCE

- 1029 Madan Mohan Malaviya's vision on agriculture education and research**, Ramesh Chand and Vinod Kumar Mishra ■ **1030 Anomalous silver concentration in volcano-plutonic rocks**, D. P. S. Rathore; *Response by* Rajeev Bidwai ■ **1032 Who is qualified to instruct scientific manuscript writing?**, Robert H. Glew, Anil K. Challa and Venkat Gopalan; *Response by* Sachi Sri Kantha

NEWS

- 1034 Bats on a budget: use of torpor by bats to conserve energy during migration**, Ipsita Herlekar ■ **1035 Challenges to education in modern India**, Parul R. Sheth ■ **1036 Human-wildlife conflict or coexistence: what do we want?**, Palatty Allesh Sinu and M. Nagarajan ■ **1039 Human-wildlife interactions and management of invasive alien species**, Monica Kaushik and Ninad Mungi

OPINION

- 1041 Research and development spending and patents: where does India stand among SAARC and BRICS**, Manthan D. Janodia

COMMENTARY

- 1043 From Millennium to Sustainable Development Goals and need for institutional restructuring**, Lenin Babu Kamepalli and Shobhana Kumar Pattanayak ■ **1045 The Indian critical zone – a case for priority studies**, Vimal Singh

TECHNICAL NOTES

- 1047 Structural analysis of solar panel cleaning robotic arm**
Amit Kumar Mondal and Kamal Bansal

SCIENTIFIC CORRESPONDENCE

- 1053 Bibliometric benchmarking of Himalayan studies in India**, B. M. Gupta and Gangan Prathap ■ **1055 Echolocation calls of four species of leaf-nosed bats (genus *Hipposideros*) from central peninsular India**, Bhargavi Srinivasulu, C. Srinivasulu and Harpreet Kaur

NATIONAL LABS: RESEARCH HIGHLIGHTS 2014

- 1058 Nano mechanical properties on the mineralogical array of calcium silicate hydrates and calcium hydroxide through molecular dynamics—CSIR-SERC**
B. Bhuvaneshwari, G. S. Palani, R. Karunya and Nagesh R. Iyer

- 1066 Transforming plant biology to translational research applications – National Botanical Research Institute**
K. N. Nair, Aradhana Mishra, M. R. Suseela, Prabodh K. Trivedi, Samir V. Sawant and C. S. Nautiyal

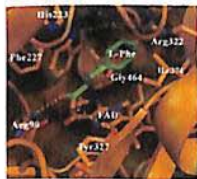
- 1072 CSIR-Advanced Materials and Processes Research Institute, Bhopal**
Navin Chand and S. A. R. Hashmi

- 1075 CSIR-North East Institute of Science and Technology, Jorhat**
D. Banik, I. I. Zhimo, R. L. Bezbaruah and D. Ramaiah

GENERAL ARTICLE

- 1080 Viability of solar rooftop photovoltaic systems in grouphousing schemes**
K. R. Shanmugavalli and Raneer Vedamuthu





RESEARCH ARTICLES

1086 **Molecular modelling approaches for designing inhibitors of L-amino acid oxidase from *Crotalus adamanteus* venom**
Jyotirmoy Mitra, Kanika Sharma and Debasish Bhattacharyya



1097 **Preclinical bioavailability–bioequivalence and toxico-kinetic profile of stable succinic acid cocrystal of temozolomide**
Edula Sravani, M. K. Chaitanya Mannava, Damandeep Kaur, B. R. Annapurna, Ronaq Ali Khan, Kuthuru Suresh, Sudhir Mittapalli, Ashwini Nangia and B. Dinesh Kumar.

1107 **Shear sense analysis of the Higher Himalayan Crystalline Belt and tectonics of the South Tibetan Detachment System, Alaknanda–Dhauliganga valleys, Uttarakhand Himalaya**
M. Shreshtha, A. K. Jain and Sandeep Singh

RESEARCH COMMUNICATIONS

1119 **Evaluation of a regional climate model for impact assessment of climate change on crop productivity in the tropics**
Manju Zacharias, S. Naresh Kumar, S. D. Singh, D. N. Swaroopa Rani and P. K. Aggarwal

1126 **The influence of sugar–phosphate backbone on the stacking interaction in B-DNA helix formation**
Sumit Mittal, Brijesh Kumar Mishra and N. Sathyamurthy.

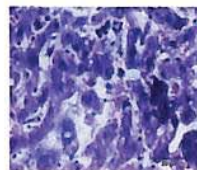
1131 ***In silico* prediction of gene knockout candidates in *Escherichia coli* genome-scale model for enhanced succinic acid production from glycerol**
Bashir Sajo Mienda, Mohd Shahir Shamsir and Rosli Md Illias

1138 **The combination of principal component analysis and geostatistics as a technique in assessment of groundwater hydrochemistry in arid environment**
Yousef Nazzal, Faisal K. Zaidi, Izrar Ahmed, Habes Ghrefat, Muhammad Naem, Nassir S. N. Al-Arifi, Saeed A. Al-Shaltoni and Khaled M. Al-Kahtany



1146 **Observations of rainfall in Garhwal Himalaya, India during 2008–2013 and its correlation with TRMM data**
D. D. Khandelwal, Anil K. Gupta and Vishal Chauhan

1151 **Drainage development in Achankovil Shear Zone, South India**
V. Dhanya and G. Renoy



1157 **High fat simple carbohydrate-fed male Wistar rats: a useful model to study metabolic syndrome**
Samantha Fernandes, Alifha Severes, Tanushree Kudnekar, Fernandes Alisha C., Deepashree R. Naik, Perantho Evan Dias, Serena D'Souza and Asha Abraham

BOOK REVIEWS

1166 **Media Construction of Environment and Sustainability in India** by Prithi Nambiar, *reviewed by* K. P. Madhu ■ 1167 **Molecular Cell Biology**, Harvey Lodish *et al.*, *reviewed by* Indranil Chattopadhyay

PERSONAL NEWS

1169 **Ravi Martanda Varma (1922–2015)**, M. S. Valiathan

HISTORICAL NOTES

1170 **Humour on Einstein as expressed in limericks**, Sachi Sri Kantha



◀ COVER. Unit cell projection of cement hydrates. See page 1058.

Indexed in CURRENT CONTENTS/GEODATA/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 7

10 April 2015

1194 In this issue

GUEST EDITORIAL

- 1195 Four key areas for training the next-generation of global change researchers
Santonu Goswami, Xiaofeng Xu and Daniel J. Hayes

CORRESPONDENCE

- 1197 Motivated and committed teacher—dire need in our education system, Anantanarayanan Raman ■ 1197 Popularization of ‘Ashtvarga’ plants for conservation and sustainable utilization, Lalit Giri, Indra D. Bhatt and Ranbeer S. Rawal ■ 1198 Endosulfan: analyses sans logic, K. M. Sreekumar and K. D. Prathapan; *Response by* P. S. Harikumar, K. Jesitha, T. Megha and Kamalakshan Kokkal ■ 1201 Rejoinder to the reviewer’s comment on ‘Bioenergetics, Thermodynamics and Plant Physiology’, Pratip Kumar Palit

NEWS

- 1202 2015 King Faisal International Prize for Science and Medicine, Sameen Ahmed Khan ■ 1203 A close look at Darwin’s finches, Ipsita Herlekar ■ 1204 Weather and climate informatics for proactive healthcare, P. Goswami and K. C. Gouda ■ 1206 Atmosphere-ocean interactions in the Indo-Pacific basin and their impact on Asian climate, G. S. Bhat and J. C. R. Hunt

OPINION

- 1208 Needs for policy on landscape restoration in India
Ramalingam Ravi and Dharma Rajan Priyadarsanan

COMMENTARY

- 1210 Antimicrobial nanotechnologies: what are the current possibilities?
Brahma N. Singh, Prateeksha, Ch. V. Rao, A. K. S. Rawat, Dalip K. Upreti and Braj R. Singh

SCIENTIFIC CORRESPONDENCE

- 1214 Preparation of polysilicon from rice-husk, D. N. Bose, A. R. Haldar and T. K. Chaudhuri ■ 1216 Uranium mineralization in Palaeoproterozoic Khetabari Formation, Bomdila Group, Sie-Rimi area, West Siang district, Arunachal Pradesh, Bhaskar Basu, Manish Sharma, C. S. Gupta, S. Thippeswamy, A. V. Jeyagopal, G. B. Joshi and R. Mohanty ■ 1219 Inter-aquifer water transfer through combination well for artificial recharging of the deeper aquifer system in Patna urban area, S. N. Dwivedi and Raj K. Singh
- 1221 ERRATUM: Human-wildlife conflict or co-existence: what do we want?
Palatty Allesh Sinu and M. Nagarajan
[*Curr. Sci.*, 2015, 108, 1036–1038]

GENERAL ARTICLES

- 1222 Does country-level governance influence auditing and financial reporting standards? Evidence from a cross-country analysis
Cristina Bota Avram, Adrian Grosanu and Paula Ramona Rachisan
- 1228 Interconnection between physical environment and pedagogical process in elementary schools in Niš, Serbia
Milan Tanic, Vojislav Nikolic, Danica Stankovic, Slavisa Kondic, Milica Zivkovic, Petar Mitkovic and Aleksandar Kekovic



SPECIAL SECTION: SUSTAINABLE PHOSPHORUS MANAGEMENT

- 1235 **Preface**
Yash P. Abrol, Nandula Raghuram and Tapan Adhya
- 1237 **Global sustainable phosphorus management: a transdisciplinary venture**
Roland W. Scholz, Debbie T. Hellums and Amit A. Roy
- 1247 **Genesis of Early Cambrian phosphorite of Krol Belt, Lesser Himalaya**
A. Mazumdar and D. M. Banerjee
- 1253 **Phosphorus supply may dictate food security prospects in India**
A. Subba Rao, Sanjay Srivastava and A. N. Ganeshamurty
- 1262 **Phosphorus in relation to dominant cropping sequences in India: chemistry, fertility relations and management options**
S. K. Sanyal, B. S. Dwivedi, V. K. Singh, K. Majumdar, S. C. Datta, S. K. Pattanayak and K. Annapurna
- 1271 **Physiological and molecular approaches for improving phosphorus uptake efficiency of crops**
Rajamanickam Elanchezhian, Vengavasi Krishnapriya, Renu Pandey, Annangi Subba Rao and Yash Pal Abrol
- 1280 **Microbial mobilization of soil phosphorus and sustainable P management in agricultural soils**
Tapan Kumar Adhya, Naresh Kumar, Gopal Reddy, Appa Rao Podile, Hameeda Bee and Bindiya Samantaray
- 1288 **Phosphorus nutrition of crops through arbuscular mycorrhizal fungi**
D. J. Bagyaraj, M. P. Sharma and D. Maiti
- 1294 **An inventory on the phosphorus flux of major Indian rivers**
R. Ramesh, R. S. Robin and R. Purvaja
- 1300 **Atmospheric deposition of phosphorus to the Northern Indian Ocean**
Bikkina Srinivas and M. M. Sarin
- 1306 **Phosphorus dynamics, eutrophication and fisheries in the aquatic ecosystems in India**
Kuldeep K. Vass, Ashwani Wangeneo, Srikanta Samanta, Subhendu Adhikari and M. Muralidhar
- 1315 **Enhancing phosphorus utilization for better animal production and environment sustainability**
C. S. Prasad, A. B. Mandal, N. K. S. Gowda, Kusumakar Sharma, A. K. Pattanaik, P. K. Tyagi and A. V. Elangovan
- 1320 **Phosphates from detergents and eutrophication of surface water ecosystem in India**
S. Kundu, M. Vassanda Coumar, S. Rajendiran, Ajay and A. Subba Rao

RESEARCH ARTICLES

- 1326 **Pedometric mapping of soil organic carbon loss using soil erosion maps of Tripura**
P. Tiwary, T. Bhattacharyya, C. Mandal, Dipanwita Dasgupta and B. Telpande
- 1340 **Soil reinforcement capability of two legume species from plant morphological traits and mechanical properties**
Mohammed Saifuddin, Normaniza Osman, M. Motior Rahman and Amru Nasrulhaq Boyce

RESEARCH COMMUNICATIONS

- 1348 **Simultaneous quantitative analysis of a three-drug combination using synchronous fluorescence spectroscopy and chemometrics**
Mandakini A. Shinde and Ottoor Divya
- 1354 **Numerical analyses of laboratory-modelled reinforced stone column**
Yogendra Tandel, Mohsin Jamal, Chandresh Solanki and Atul Desai
- 1362 **On the vertical wavelength estimates using the Krassovsky parameters of OH airglow monitoring**
R. N. Ghodpage, A. Taori, P. T. Patil, Devendraa Siingh, S. Gurubaran and A. K. Sharma



1369. **Dynamical model of daily CO concentration over Delhi: assessment of forecast potential**
Jurismita Baruah and Prashant Goswami
- 1375 **Spatio-temporal variability of snow cover in Alaknanda, Bhagirathi and Yamuna sub-basins, Uttarakhand Himalaya**
B. P. Rathore, S. K. Singh, I. M. Bahuguna, R. M. Brahmabhatt, A. S. Rajawat, A. Thapliyal, A. Panwar and Ajai

BOOK REVIEWS

- 1381 **Annual Review of Medicine, 2014**, C. Thomas Caskey, Mary E. Klotman, Peter Scardino (eds),
reviewed by Sanjay A. Pai
- 1382 **Annual Review of Nuclear and Particle Science, 2014**, Barry R. Holstein, Wick C. Haxton and
Abolhassan Jawahery (eds), *reviewed by* B. Ananthanarayan
- 1384 **Perspectives in Environmental Studies, Fourth Multi Colour Edition**, Anubha Kaushik and
C. P. Kaushik, *reviewed by* Rashneeh N. Pardiwala

PERSONAL NEWS

- 1386 **John Webster (1925–2014)**, C. V. Subramanian
-



- ◀ **COVER.** *Habenaria intermedia*, commonly known as Riddhi, is one of the critically endangered medicinal orchids growing in Surkanda, Tehri Garhwal, Uttarakhand. See page 1197.

The editor thanks Dr Yash P. Abrol, Dr Nandula Raghuram and Dr Tapan Adhya, New Delhi for agreeing to be guest editors for the special section.

Indexed in CURRENT CONTENTS/GEODATABASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 8

25 April 2015

1406 In this issue

GUEST EDITORIAL

1407 **Predatory journals and academic pollution**
S. C. Lakhota

CORRESPONDENCE

1409 **Disparity and delay in implementation of fellowship hike disappoints research scholars,** G. H. Chethan ■ 1409 **Geographical Indication tag for basmati's fragrance: the battle won in the US but lost in India,** Devi Singh, Vemuri Ravindra Babu and Ritesh Sharma ■ 1410 **Conventional Indian soil testing: need for major change,** Arun Kumar, Raj Deo Singh, Balkrishna Sopan Bhople and Deepak Rameshwar Sapkal

NEWS

1412 **Combustion science,** Varun Shivakumar, P. A. Ramakrishna and H. S. Mukunda ■ 1414 **A step towards increasing garlic productivity,** R. P. Gupta ■ 1415 **SERB School in neuroscience,** Vidyadhari Mudigonda and Shashank Chepurwar

OPINION

1416 **Taxonomy matters,** Rajeev Raghavan and Neelesh Dahanukar ■ 1418 **Pervasive incursion of extremism in academic fields,** Arun Bapat

COMMENTARY

1420 **How does the Indian television cover climate change?,** I. Arul Aram and G. C. Prem Nivas ■ 1421 **Growth of water purification technologies in the era of 'regulatory vacuum' in India,** Saradindu Bhaduri, Aviram Sharma and Nazia Talat

SCIENTIFIC CORRESPONDENCE

1424 **Inductively coupled plasma-mass spectrometric profiling of metal contamination in Holi colours,** Mousumi Debnath, Parmeshwar Lal and Renu Jain ■ 1428 **Malin–Maharashtra landslides: a disaster triggered by tectonics and anthropogenic phenomenon,** SM. Ramasamy, M. Muthukumar and M. Subagunasekar ■ 1430 **Water quality index of estuarine environment,** N. C. Ujjania and Monika Dubey

NATIONAL LABS: RESEARCH HIGHLIGHTS 2014

1434 **Institute of Advanced Study in Science and Technology, Guwahati**
N. C. Talukdar

1438 **Central Food Technological Research Institute, Mysuru**
Ram Rajasekharan

1441 **CSIR–Central Institute of Medicinal and Aromatic Plants, Lucknow**
Anil Kumar Tripathi

1444 **CSIR–Central Building Research Institute, Roorkee**
S. K. Bhattacharyya and Atul Kumar Agarwal

1454 **Understanding our seas: National Institute of Oceanography, Goa**
S. W. A. Naqvi and CSIR–NIO Team

GENERAL ARTICLES

1461 **The Barrie Jones Lecture – eye care for the neglected population: challenges and solutions**
G. N. Rao

1476 **Institutionalization of grassroots innovation in India**
Olga V. Ustyuzhantseva





REVIEW ARTICLES

- 1483 Occurrence of molecularly diverse *Bt* Cry toxin-resistant mutations in insect pests of *Bt*⁺ corn and cotton crops and remedial approaches
Sushil Kumar and Renu Kumari.

- 1491 Face anti-spoofing methods
Sajida Parveen, Sharifah Mumtazah Syed Ahmad, Marsyita Hanafi and Wan Azizun Wan Adnan

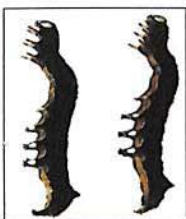


RESEARCH ARTICLE

- 1501 Status of soil degradation in an irrigated command area in Chikkarasinakere Hobli, Mandya district, Karnataka
Rajendra Hegde, A. Natarajan, R. S. Meena, K. V. Niranjana, S. Thayalan and S. K. Singh

RESEARCH COMMUNICATIONS

- 1512 Assessment of lipid profiles of adult male athletes from two different air pollutant zones of West Bengal, India
Paulomi Das and Pinaki Chatterjee



- 1516 *In vitro* and *in vivo* inhibition of haemolymph juvenile hormone esterase activity by the ethanol extract of *Clerodendrum inerme* in fifth instar larva of castor semilooper, *Achaea janata* (L.)
S. R. Yankanchi, V. L. Kallapur and S. N. Holihosur.

- 1520 Molecular characterization of viroid associated with tapping panel dryness syndrome of *Hevea brasiliensis* from India
Ajay Kumar, D. M. Pandey, Thomson Abraham, Jacob Mathew, P. Jyothsna, Padma Ramachandran and V. G. Malathi



- 1527 Technology for rehabilitation of Yamuna ravines – cost-effective practices to conserve natural resources through bamboo plantation
A. K. Singh, S. Kala, S. K. Dubey, V. C. Pande, B. K. Rao, K. K. Sharma and K. P. Mahapatra

- 1534 Spatial patterns and diversity of alpine vegetation across Langer–Shandur Valley, Hindukush Himalayas
Hamayun Shaheen, Zia-Ur-Rehman Mashwani and Muhammad Ejaz Ul Islam Dar

- 1540 Uranium-bearing magnesian-calcrete in surficial environment from Khemasar, Churu District, Rajasthan, India
A. Yugandhara Rao, K. Vijay Raj, O. P. Yadav, L. K. Nanda, A. K. Rai and P. S. Parihar



- 1544 Ant larvae silk fibres mat
M. Prajwal, M. A. Sangamesha and K. Pushpalatha

BOOK REVIEWS

- 1548 An Introductory Course of Particle Physics by Palash B. Pal, reviewed by Chethan Krishnan ■ 1549 The Cosmic Cocktail: Three Parts Dark Matter by Katherine Freese, reviewed by Biman Nath ■ 1550 The Big Ratchet: How Humanity Thrives in the Face of Natural Crisis. A Biography of an Ingenious Species by Ruth DeFries, reviewed by P. C. Kesavan ■ 1552 Proceedings of XXIII Indian Colloquium on Micropalaeontology and Stratigraphy and International Symposium on Global Bioevents in Earth's History, N. Malarkodi, Gerta Keller, A. N. Reddy and B. C. Jaiprakash (eds), reviewed by Rahul Garg



- ◀ COVER. A *Bt* protected cotton plant (Photo: K. Kranthi). See page 1483.

Indexed in CURRENT CONTENTS/GEODATABASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 9

10 May 2015

1574 **In this issue**

GUEST EDITORIAL

1575 **Support for science**
M. Vijayan

CORRESPONDENCE

1577 **A Ph D may not be enough**, Arabinda Mahanty ■ 1577 **Why is 'dissection' such a dirty word?**, N. K. Subhedar ■ 1578 **Non-professionals in-charge of libraries**, Anil Singh ■ 1579 **Forests as refuges for birds in the Eastern Ghats of Tamil Nadu**, R. J. Ranjit Daniels, J. Patrick David and B. Vinoth

NEWS

1580 **Indian paper crosses 5000+ citations mark**, Nitin Kumar, Yatish Panwar and G. Mahesh ■ 1581 **Traditional agriculture systems**, R. K. Maikhuri, Vikram S. Negi, L. S. Rawat, A. K. Sahani, R. C. Sundriyal and P. P. Dhyani ■ 1583 **Marine ecosystems**, K. Vijayakumaran and S. Lakshmi Pillai

OPINION

1586 **On the way to innovation**, B. A. Dasannacharya ■ 1587 **Cultivation of *Saussurea costus* cannot be treated as 'artificially propagated'**, Chandra P. Kuniyal, Dharmendra S. Rawat and Rakesh C. Sundriyal

COMMENTARY

1590 **A frontier area of research on liquid biopesticides: the way forward for sustainable agriculture in India**, Mahendrakar Sreenivasa Rao, Rajappa Umamaheswari, Akshay Kumar Chakravarthy, Gummala Nuthana Grace, Manoharan Kamalnath and Pandi Prabu ■ 1593 **Biomass exploitation – a challenge finding its way to reality**, Mamata S. Singhvi and Digambar V. Gokhale

NATIONAL LABS: RESEARCH HIGHLIGHTS 2014

1595 **Carbon quantum dots-mediated direct fluorescence assay for the detection of cardiac marker myoglobin**

Munish Shorie, Vinod Kumar, Priyanka Sabherwal and A. K. Ganguli

1597 **Geothermal systems in the Northwest Himalaya**

Santosh K. Rai, Sameer K. Tiwari, S. K. Bartarya and Anil K. Gupta

1600 **Raman Research Institute, Bengaluru**

Debarshini Chakraborty

GENERAL ARTICLES

1603 **Impact of international cooperation and science and innovation strategies on S&T output: a comparative study of India and China**

S. A. Hasan, Amit Rohilla and Rajesh Luthra

1608 **Next-generation particle accelerators for frontline research and wide-ranging applications in India – how to realize them?**

R. K. Bhandari and Amit Roy

1616 **Decoding urban India's carbon footprint: spatial-numerical mapping of thermal energy emissions**

Mahendra Sethi

REVIEW ARTICLE

1624 **MicroRNAs and target mimics for crop improvement**

Pushpendra K. Gupta



RESEARCH ARTICLES

- 1634 **3 β -Hydroxy-5,16-pregnadien-20-one exhibits both hypolipidemic and hypoglycemic activities**
R. Pratap, R. C. Gupta, R. Chander, A. K. Khanna, Vinita Singh, (Late) N. K. Kapoor, A. K. Srivastava, D. Raina, S. Singh, A. Ghatak, O. P. Asthana, (Late) S. Nityanand, Sukh Dev and Nitya Anand
- 1647 **Silica-zirconia alkali-resistant coatings by sol-gel route**
Sunetra Laxman Dhere
- 1653 **Development of self-sustaining phototrophic granular biomass for bioremediation applications**
Rajesh Kumar and Vayalam P. Venugopalan
- 1662 **Landslide susceptibility zonation of Tehri reservoir rim region using binary logistic regression model**
Rohan Kumar and R. Anbalagan
- 1673 **Effects of addition of cationic ligands in hydrous bismuth oxide on removal of fluoride from aqueous solutions**
M. Ranjan, A. L. Srivastav and Shaktibala

RESEARCH COMMUNICATIONS

- 1683 **Liquorice (*Glycyrrhiza glabra*): a potential salt-tolerant, highly remunerative medicinal crop for remediation of alkali soils**
J. C. Dagar, R. K. Yadav, S. R. Dar and Sharif Ahamad
- 1688 **Tree species composition in Koyna Wildlife Sanctuary, Northern Western Ghats of India**
A. Joglekar, M. Tadwalkar, M. Mhaskar, B. Chavan, K. N. Ganeshaiyah and A. Patwardhan,
- 1694 **HR-MAS NMR-based metabolomic approach to study the effect of fungicidal stress on wheat seed germination**
Navdeep Gogna and Kavita Dorai
- 1702 **Northeast Microbial Database: a web-based databank of culturable soil microbes from North East India**
S. R. Joshi, Subhro Banerjee, Kaushik Bhattacharjee, Nathaniel A. Lyngwi, Khedarani Kojiam, Polashree Khaund, Lamabam Sophiya Devi and Fenella M. W. Nongkhlaw
- 1706 **The May 21st, 2014 Bay of Bengal earthquake: implications for intraplate stress regime**
A. K. Rai, S. Tripathy and S. C. Sahu
- 1712 **The admissible tsunamigenic source region of 24 September 2013 land-based earthquake – application of backward ray tracing technique**
Ch. Patanjali Kumar, B. Ajay Kumar, E. Uma Devi, R. S. Mahendra, M. V. Sunanda, M. Pradeep Kumar, J. Padmanabham, S. Dipankar and T. Srinivasa Kumar
- 1717 **Soft sediment deformation structures in late Quaternary abandoned channel fill deposit of Yamuna river in NW Sub-Himalaya, India**
Anand K. Pandey and Prabha Pandey
- 1725 **Nest site characterization of sympatric hornbills in a tropical dry forest**
Ushma Shukla, Soumya Prasad, Mohan Joshi, Sachin Sridhara and David A. Westcott

LIVING LEGENDS IN INDIAN SCIENCE

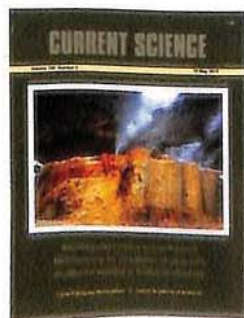
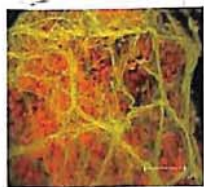
- 1731 **B. V. Sreekantan: A versatile and humane scientist**, P. C. Agrawal

BOOK REVIEWS

- 1741 **Scientific Integrity: Text and Cases in Responsible Conduct of Research** by Francis L. Macrina, reviewed by Yateendra Joshi ■ **1741 Annual Review of Biophysics, 2014**, Ken A. Dill and Xiaowei Zhuang (eds), reviewed by B. Gopal

- ◀ **COVER.** Tapoban Geothermal Spring situated in the deep valley of Alaknanda headwaters, in Garhwal Himalaya (India). It emanates a jet of water, steam and other volatiles showing a relatively higher reservoir temperature. See page 1597.

Indexed in CURRENT CONTENTS/GEODATABASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE



CURRENT SCIENCE



Volume 108 Number 10

25 May 2015

1770 In this issue

GUEST EDITORIAL

1771 **What ails physics education in the country?**
R. Srinivasan

CORRESPONDENCE

1773 **Developing sea-watered landscapes: a potential way to reduce stress on freshwater resources**, Ali El-Keblawy, Arvind Bhatt and Sanjay Gairola ■ 1774 **Do cover page papers get more citations?**, Monika Verma, Yatish Panwar and G. Mahesh ■ 1775 **Rise of Indian science – a bibliometric analysis**, Ashwani Kumar

NEWS

1778 **Development dilemma for the North East Region of India**, Prasanna K. Samal, P. P. Dhyani, R. C. Sundriyal and K. S. Kanwal ■ 1779 **Ecosystem monitoring and forest census studies in South Asia**, Toby Richard Marthews, Swapna Nelaballi, Jayashree Ratnam and Mahesh Sankaran ■ 1782 **Somatic embryogenesis and bioreactors**, Anitha Karun, M. K. Rajesh and K. S. Muralikrishna

RESEARCH NEWS

1784 **White dwarfs that crossed the Chandrasekhar limit: can modified Einstein's theory explain them?**
G. V. Punyakoti

COMMENTARY

1787 **Brain of the genius – Albert Einstein**
Debosree Ghosh and Pratap Parida

OPINION

1788 **Riparian forests for healthy rivers**
Avantika Bhaskar and N. Muthu Karthick

SCIENTIFIC CORRESPONDENCE

1790 **Performance of SC/ST candidates in qualifying CSIR-UGC National Eligibility Test for JRF to pursue doctoral research**, S. A. Hasan and Rajesh Luthra ■ 1793 **A mechanism of self-pollination in *Ajuga bracteosa* Wallich ex Benth**, Aijaz Hassan Ganie, Bilal Ahmad Tali, Irshad A. Nawchoo and Zafar A. Reshi ■ 1796 **Platinum-group elements mineralization in the cumulate gabbro of Phenai Mata Complex, Deccan Large Igneous Province, India**, Kirtikumar Randive, J. Vijaya Kumar and Mahesh Korakoppa ■ 1799 **Feral dogs of Spiti Valley, Himachal Pradesh: an emerging threat for wildlife and human life**, Anil Kumar and Rahul Paliwal

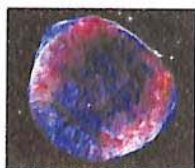
TECHNICAL NOTES

1801 **Study of two xanthene dyes using spectrally resolved three-pulse photon echo spectroscopy**
Ajitesh Kumar, S. K. Karthick Kumar, Sumit Singhal and Debabrata Goswami

GENERAL ARTICLES

1804 **'Species concept' in microbial taxonomy and systematics**
Rohit Sharma, Ashish V. Polkade and Yogesh S. Shouche

1815 **Assessment of environmental flow requirements for hydropower projects in India**
Sharad K. Jain



- 1826 **National Agroforestry Policy in India: a low hanging fruit**
S. B. Chavan, A. Keerthika, S. K. Dhyani, A. K. Handa, Ram Newaj and K. Rajarajan

SPECIAL SECTION: EVOLUTIONARY BIOLOGY

- 1835 **Preface**
Krushnamegh Kunte and Deepa Agashe
- 1838 **IN CONVERSATION: Amitabh Joshi; Ipsita Herlekar** ■ 1840 **Milind Watve; Ipsita Herlekar**
- 1842 **Genetics of behavioural isolation**
Rhitoban Raychoudhury
- 1847 **An island called India: phylogenetic patterns across multiple taxonomic groups reveal endemic radiations**
K. Praveen Karanth
- 1852 **Senses and signals: evolution of floral signals, pollinator sensory systems and the structure of plant-pollinator interactions**
G. S. Balamurali, Shivani Krishna and Hema Somanathan
- 1862 **How mutualisms between plants and insects are stabilized**
Renee M. Borges
- 1869 **How should biologists engage with controversial mathematical theory?**
Raghavendra Gadagkar

REVIEW ARTICLE

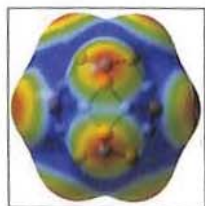
- 1874 **Phosphorus dynamics in mangroves of India**
Gurmeet Singh, Rita Chauhan, Rajesh Kumar Ranjan, M. Balakrishna Prasad and AL. Ramanathan

RESEARCH ARTICLES

- 1882 **Improved thermography technique for identifying structural elements under ambient conditions**
K. Sivasubramanian, K. P. Jaya and K. Ramanjaneyulu
- 1890 **Non-destructive assessment of rebar corrosion based on equivalent structural parameters using peizo-transducers**
V. Talakokula, S. Bhalla, B. Bhattacharjee and A. Gupta
- 1901 **Response of a natural phytoplankton community from the Qingdao coast (Yellow Sea, China) to variable CO₂ levels over a short-term incubation experiment**
Haimanti Biswas, Jin Jie, Ying Li, Guosen Zhang, Zhuo-Yi Zhu, Ying Wu, Guo-Ling Zhang, Yan-Wei Li, Su Mei Liu and Jing Zhang

RESEARCH COMMUNICATIONS

- 1910 **Computational study on ammonia adsorption on the X₁₂Y₁₂ nano-clusters (X = B, Al and Y = N, P)**
Ali Ahmadi Peyghan and Hamed Soleymanabadi
- 1915 **Upper tropospheric humidity from SAPHIR on-board Megha-Tropiques**
Nizy Mathew, Viju Oommen John, C. Suresh Raju and K. Krishna Moorthy
- 1922 **Indian and Chinese higher education institutions compared using an end-to-end evaluation**
S. Savithri and Gangan Prathap
- 1926 **Distribution pattern of bacteria in the two geographic poles and Southern Ocean from the reported 16S rDNA sequences**
Pratibha Gupta, Harsh Kumar Agrawal and Rajib Bandopadhyay
- 1931 **²²²Rn distribution pattern in dwellings of copper mineralized area of East Singhbhum region, Jharkhand, India**
Asheesh Mishra, R. Lokeswar Patnaik, Vivekanand Jha, Shailendra Kumar Sharma, Durga Charan Panigrahi and Akshaya Kumar Sarangi



- 1938 **The 25 April 2015 Nepal earthquake and its aftershocks**
S. Mitra, Himangshu Paul, Ajay Kumar, Shashwat K. Singh, Siddharth Dey and Debarchan Powali
-

BOOK REVIEWS

- 1944 **Anthropometric and Strength Data of Indian Agricultural Workers for Farm Equipment Design**, L. P. Gite, J. Majumdar, C. R. Mehta and A. Khadatkar (eds), *reviewed by* Rajvir Yadav, Niranjana Prasad, Punkaj Gupta and A. L. Vadher
- 1944 **Annual Review of Pharmacology and Toxicology, 2014**, P. A. Insel, S. G. Amara and T. F. Blaschke (eds), *reviewed by* Madhu Dikshit
- 1946 **Handbook of Genetics & Biotechnology, Revised and Expanded 2nd Edition, 2014**, Rukam S. Tomar *et al.*, *reviewed by* S. C. Lakhotia
-

- 1947 **ADDENDUM: Understanding our seas: National Institute of Oceanography, Goa**
S. W. A. Naqvi and CSIR-NIO Team
[*Curr. Sci.*, 2015, 108(8), 1454–1460]
-

HISTORICAL NOTES

- 1948 **Public-health management in the Madras Presidency in early 20th century: the King Institute of Preventive Medicine, Madras and its pioneering surgeons**
Ramya Raman and Anantanarayanan Raman
-



- ◀ **COVER.** The cover picture shows male *Euploea midamus*, a toxic butterfly that other palatable butterflies mimic. A. R. Wallace, who proposed the theory of evolution by natural selection, wrote about the superabundance of *Euploea* and related danaine butterflies in relation to their mimics while developing the idea of frequency-dependent natural selection. The special section on evolutionary biology explores Wallace's contributions to the field, and presents a selection of current topics in evolution. (Photo credit: Krushnamegh Kunte).

The editor thanks Dr Krushnamegh Kunte and Dr Deepa Agashe, National Centre for Biological Sciences, Tata Institute of Fundamental Research, Bengaluru 560 065, India for agreeing to be guest editors for the special section.

Indexed in CURRENT CONTENTS/GEODATABASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 11

10 June 2015



1966 In this issue

GUEST EDITORIAL

1967 Some reflections on science and discovery
J. Marvin Herndon

CORRESPONDENCE

1969 A nodal centre to screen microbial extracts for various properties, V. V. Sarma ■ 1969 Bamboo invasion: threat to primate conservation in North East India, Koushik Majumdar, Arun Jyoti Nath, A. K. Gupta and B. K. Datta ■ 1972 Coverage of climate change issues in Indian newspapers and policy implications, S. Nagarathinam and Archita Bhatta ■ 1973 Does *Prosopis juliflora* negatively impact upon the nesting success of heronry birds? A critique of a report in *Current Science*, A. J. Urfi and N. K. Tiwary; *Response* by S. Chandrasekaran

NEWS

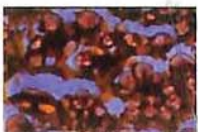
1975 India to host the 46th International Physics Olympiad this year, Bhupati Chakrabarti ■ 1976 New feathers in the cap, Ipsita Herlekar ■ 1976 Cell death and disease, G. Sudhandiran, Niranjali Devaraj and M. Balasubramanyam ■ 1978 Basic research to herald a new era in pest management science, A. K. Chakravarthy, D. Lokeshwari, V. Sridhar and K. R. Latha

OPINION

1981 Empowering undergraduate biological science degree courses towards job and food security in India, R. K. Muthunayagam

COMMENTARY

1982 Tropical birds and climate change: lessons from the southern Eastern Ghats
R. J. Ranjit Daniels



SCIENTIFIC CORRESPONDENCE

1984 Seed coat architecture of four Indian species of *Ephedra* and its taxonomic significance, Soma Majumder, Ashalata D'Rozario and Subir Bera ■ 1987 Khejri, the king of Indian Thar desert is under phenophase change, P. Ratha Krishnan and S. K. Jindal ■ 1990 *Acrobotrys disolenia* Haeckel from the late Miocene of Andaman and Nicobar Islands, Arindam Chakraborty and Amit K. Ghosh ■ 1994 Recognition of a new albitite zone in northern Rajasthan: its implications on uranium mineralization, G. S. Yadav, A. Muthamilselvan, T. S. Shaji, L. K. Nanda and A. K. Rai



NATIONAL LABS: RESEARCH HIGHLIGHTS 2014

1999 Green synthesis of nanomaterials with special reference to environmental and biomedical applications
Sujoy K. Das and Asit Baran Mandal

2003 CSIR-Indian Institute of Toxicology Research, Lucknow
B. D. Bhattacharji and Mukul Das

2007 Agharkar Research Institute, Pune
K. M. Paknikar

2010 CSIR-National Geophysical Research Institute, Hyderabad
Y. J. Bhaskar Rao, Shakeel Ahmed, Vineet Gahalaut, Anil Kumar and M. Ravi Kumar

2014 Some recent technological achievements of CSIR-National Metallurgical Laboratory
S. Srikanth





GENERAL ARTICLE

- 2017 **Adoption of Chinese ink painting elements in modern poster design inspired by innovation research on physical and chemical reactions**
Yifeng Liu, Chengzi Zhang and Liqun Zhou

REVIEW ARTICLE

- 2023 **Understanding poor storage potential of recalcitrant seeds**
R. Umarani, E. Kanthaiya Aadhavan and M. Mohamed Faisal

RESEARCH ARTICLES

- 2035 **Effect of nano-SiO₂ particles on fracture properties of concrete composite containing fly ash**
Peng Zhang, Xiao-Bing Dai, Ji-Xiang Gao and Peng Wang
- 2044 **Flubendiamide-induced HSP70 expression in transgenic *Drosophila melanogaster* (hsp70-lacZ)**
Saurabh Sarkar, Sayanti Podder and Sumedha Roy
- 2051 **Characterization and crop planning of *rabi* fallows using remote sensing and GIS**
K. K. Bandyopadhyay, R. N. Sahoo, Ravender Singh, S. Pradhan, S. Singh, Gopal Krishna, S. Pargal and S. K. Mahapatra
- 2063 **Dynamics of well irrigation systems and CO₂ emissions in different agroecosystems of South Central India**
K. S. Reddy, M. Kumar, V. Maruthi, B. Umesh, Vijayalaxmi and C. V. K. Nageswar Rao
- 2071 **Thermal anomalies in relation to earthquakes in India and its neighbourhood**
Rajesh Prakash and H. N. Srivastava



RESEARCH COMMUNICATIONS

- 2083 **Ignition delay of 3-carene: single pulse shock tube study**
N. Sharath, K. P. J. Reddy, P. K. Barhai and E. Arunan
- 2087 **Comparison of performance of solar photovoltaics on dual axis tracker with fixed axis at 13°N latitude**
Roshan R. Rao, H. R. Swetha, J. Srinivasan and Sheela K. Ramasesha
- 2094 **Amelioration of fluoride toxicity using amla (*Emblia officinalis*)**
Sumeet Ranjan and Shahla Yasmin
- 2098 **Effects of grassland degradation on air and soil temperature in Songnen plain of northeast China**
Xiangjin Shen, Binhui Liu and Daowei Zhou
- 2101 **Monogenoidea on exotic Indian freshwater fish. 3. Are Indian guidelines for importation of exotic aquarium fish useful and can they be implemented; The case of Neotropical *Gussevia spiralicirra* Kohn and Paperna, 1964**
Amit Tripathi



BOOK REVIEWS

- 2106 **Photobiology: The Science of Light and Life**, Lars Olof Björn (ed.), reviewed by Swati Tiwari ■ 2107 **Essential Maths for Geoscientists: An Introduction** by Paul I. Palmer, reviewed by A. P. Pradeepkumar

PERSONAL NEWS

- 2108 **John Forbes Nash Jr (1928–2015)**, Vivek S. Borkar

HISTORICAL NOTES

- 2110 **S. R. Ranganathan: library and documentation scientist**, Md. Nurul Islam



◀ COVER. Environmental sustainable metal nanoparticles for applications in bio-medical and wastewater management. See page 1999.

Indexed in CURRENT CONTENTS/GEODATABASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/WEB OF SCIENCE

CURRENT SCIENCE

Volume 108 Number 12

25 June 2015

2134 **In this issue**

GUEST EDITORIAL

2135 **Indian science and higher education: the way forward**
Krishna N. Ganesh

CORRESPONDENCE

2137 **Nepal earthquake, effect in Bihar and 85°E ridge**, Upendra Raval ■ 2137 **A rare incident of tricotyledony in *Cleome viscosa* L.**, Shveta Saroop and Veenu Kaul ■ 2138 **It is imperative that early education be made inclusive**, S. N. Balasubrahmanyam; *Response by* Roddam Narasimha ■ 2139 **Spreading knowledge of classical India mathematics**, Krishnamachar Sreenivasan

NEWS

2140 **Biodegradable ropes from seaweed extracts**, Ipsita Herlekar ■ 2141 **Mohanbhai I. Patel (D.Sc.) Institute of Excellence in Astronomy and Astrophysics**

RESEARCH NEWS

2142 **A boon in studies of cognitive functions: brain and grid cells**, Ankur Agarwal, Saurabh Mishra, Harsh Kumar Agrawal and Rajib Bandopadhyay

OPINION

2145 **Evaluating the claims of ancient Indian achievements in science**, Mayank Vahia ■ 2149 **Taxonomy – the science and art of species**, Balakrishna Pisupati

COMMENTARY

2151 **Our higher education – deficits and possible remedies**
S. K. Sen

SCIENTIFIC CORRESPONDENCE

2156 **An example of consistent palaeostress regime resulting in morphometric irregularity in the northwestern part of Noachis Terra, Mars**, Keyur De, Abhik Kundu, Prakash Chauhan and Nilanjan Dasgupta ■ 2159 **Highly potassic melagranite of Bintang Batholith, Main Range Granite, Peninsular Malaysia**, Long Xiang Quek, Azmiah Jamil, Azman A. Ghani and Mokhtar Saidin ■ 2163 **Species diversity–primary productivity relationships in a nitrogen amendment experiment in grasslands at Varanasi, India**, R. Sagar, Punita Verma, Hariom Verma, Dharmendra K. Singh and Preeti Verma

GENERAL ARTICLES

2167 **Controlled material transport and multidimensional patterning at small length scales using electromigration**
Santanu Talukder, Praveen Kumar and Rudra Pratap

2173 **Aluminum poisoning of humanity and Earth's biota by clandestine geoengineering activity: implications for India**
J. Marvin Herndon

RESEARCH ACCOUNT

2178 **Fifty years of tiger pheromone research**
R. L. Brahmachary and Mousumi Poddar-Sarkar

REVIEW ARTICLE

2186 **Fifty years of peephole optimization**
Pinaki Chakraborty



RESEARCH ARTICLES

- 2191 **Recent trends in wind-wave climate for the Indian Ocean**
Nitika Gupta, Prasad K. Bhaskaran and Mihir K. Dash
- 2202 **Assessment of water yield and evapotranspiration over 1985 to 2010 in the Gomti River basin in India using the SWAT model**
N. S. Abeysingha, Man Singh, V. K. Sehgal, Manoj Khanna, Himanshu Pathak, Priyantha Jayakody and Raghavan Srinivasan
- 2213 **Morphological trait variations in the west Himalayan (India) populations of *Arabidopsis thaliana* along altitudinal gradients**
Akanksha Singh, Antariksh Tyagi, Abhinandan Mani Tripathi, Sadashiv M. Gokhale, Nandita Singh and Sribash Roy
- 2223 **Stable isotope evidence for ca. 2.7-Ga-old Archean cap carbonates from the Dharwar Supergroup, southern India**
Subrata Das Sharma and R. Srinivasan
- 2230 **Multichannel analysis of surface waves and high-resolution electrical resistivity tomography in detection of subsurface features in northwest Himalaya**
A. K. Mahajan, Subash Chandra, V. S. Sarma and B. R. Arora
- 2240 **Geochemistry, petrography and rock magnetism of the basalts of Phek district, Nagaland**
Watitemsu Imchen, S. K. Patil, V. Rino, Glenn T. Thong, Temjenrenla Pongen and B. V. Rao

RESEARCH COMMUNICATIONS

- 2250 ***Imperata* grasslands: carbon source or sink?**
Karabi Pathak, Arun Jyoti Nath and Ashesh Kumar Das
- 2254 **Status and impact of protected cultivation in Himachal Pradesh, India**
R. S. Spehia
- 2257 **Comparative study of feed-forward neuro-computing with multiple linear regression model for milk yield prediction in dairy cattle**
Manisha Dinesh Bhosale and T. P. Singh
- 2261 **Occurrence of unusual quartz xenocryst-laden dykes in the Chhota Udaipur alkaline-carbonatite sub-province, Deccan Igneous Province, India**
Kirtikumar Randive
- 2266 **Distribution of naturally occurring radionuclides uranium and ^{226}Ra in groundwater adjoining uranium complex of Turamdih, Jharkhand, India**
Rajesh Kumar, V. N. Jha, S. K. Sahoo, S. Jha, S. Kumar, P. M. Ravi and R. M. Tripathi

BOOK REVIEWS

- 2273 **Imperial Technoscience: Transnational Histories of MRI in the United States, Britain, and India** by Amit Prasad, reviewed by Subhasis Sahoo ■ 2274 **The Untold Story of a Coast** by John Jacob Puthur, reviewed by Wallace Jacob ■ 2276 **Molecular Biology** by Channarayappa, reviewed by Anurag Agrawal

PERSONAL NEWS

- 2277 **Krishna Kumar (1928–2014)**, G. K. Mahapatro, Kolla Sreedevi and Sachin Kumar

HISTORICAL NOTES

- 2279 **Was the bright comet of 1742 discovered from India?**, R. C. Kapoor



- ◀ COVER. Electromigration induced pattern formation of stand-alone structures at multiple length scales. See page 2167.

Indexed in CURRENT CONTENTS/GEOBASE/CHEMICAL ABSTRACTS/IndMED/SCOPUS/
WEB OF SCIENCE