

SPECIAL ISSUE

# TIME

IN THE STEPS OF  
**Marco Polo**



## Natural Healing

Will India succeed in bringing its ancient Ayurvedic plant medicines into the modern world?

SUMMER JOURNEY  
**East Meets West**

We follow up the steps of Marco Polo in a special double issue that can be placed in the magazine of today.

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# TKDL in Time

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## In the Steps of Marco Polo How East Meets West Today

*Time*, one of the world's most prestigious news magazines, has been giving wide coverage to the resurgence of India and China since the past decade. Progressing at a fast pace, the two Asian giants figure among the world's top ten economies today, and *Time* has portrayed their phenomenal rise through many articles "It's a Whole New World", "Catching Market Waves", "Strength in Numbers", "People Think India Is a Poor Country. It Is Not", "A Place in the Sun", "Bangalore Goes Global", "Superpower Rising?" and "The Impact of Asia's Giants", to name a few.

Now, *Time Asia* and *Time Europe* have brought out their 7-14 August 2006 issues as special numbers, which take a look at 'How East Meets West Today in the Steps of Marco Polo', highlighting the globalization of economies and, more importantly, the resurgence/decline of the various countries/regions which Marco Polo visited more than 700 years ago. The coverage in *Time* includes: the fast growing trade and power of China, mineral explorations in Mongolia, the historic 'Silk Road' cities Bukhara and Samarkand in Uzbekistan; the prosperous Singapore and lawless Malacca Strait, the conflicted Sri Lanka; Zanzibar's dream to regain its past glory; and Istanbul, where East and West are not mutually exclusive.

Regarding India, *Time* reports the country's efforts towards protecting and reviving its rich medicinal system Ayurveda, which was thriving during the period of Marco Polo. The efforts mentioned are the world acclaimed Traditional Knowledge Digital Library (TKDL), conceptualized and being established at the National Institute of Science Communication and Information Resources (NISCAIR), New Delhi, and plantation of and R&D on the aromatic and medicinal plants by the Arya Vaidya Sala (AVS) in Kottakkal in Kerala.





### **In the Steps of Marco Polo How East Meets West Today...**

**B**eginning his 24-year odyssey to the East in 1271, Marco Polo went through Caucasus, Persia, Afghanistan, Pamirs and, taking the 'Silk Route', to China. He stayed in the court of Kublai Khan for 17 years, and then sailed back through South China Sea, Malacca Strait, Indian Ocean and finally docked at Hormuz and reached Venice in 1296. Two years later, he conceived *The Description of the World*, which was later called *Travels of Marco Polo*, to record his reminiscence of the East. This first ever exposure of the East by the daring Venetian portrayed most of Asia so prosperous and culturally advanced that it looked like a fairy tale to the West. The centuries that followed witnessed aggressions, change of dynasties, and imperialism, which swung the pendulum in favour of the West.

But the East and the West are rediscovering each other as many Asian countries are surging ahead

once again. How are the places Polo visited faring now and how are the East and the West viewing each other today? A few examples from the articles published in the *Time's* special issue:

□ **India** — One of the world's ten top economies today, India is making efforts to protect and revive its highly rich ancient medical system, Ayurveda, through the establishment of Traditional Knowledge Digital Library (TKDL), and plantation of and R&D on the aromatic and medicinal plants.

□ **China** — China is today the Asia's top economy. Places like Xinjiang in the West China, from where Polo passed, are turning into prominent centres of industry and trade. China continues to be the top producer of silk, but only in quantity, in quality, today it is Italy.

□ **Istanbul** — Here East and West are not mutually exclusive.

□ **Malacca Strait** — Located at world's most important sea line, Singapore efficiently handles annually 20 million containers riding on 200 shipping lines serving 600 ports in 123 countries. Singapore is today, what Malacca was once.

□ **Mongolia** — Once richest on the planet, Mongols were chased back by Ming within 80 years of Kublai Khan's death. Living at the mercy of its neighbors since then, Mongolia is today trying to become prosperous once again through tapping of its mineral wealth with the help of Western companies like the Vancouver-based Ivanhoe Mines.

□ **Sri Lanka** — Once prosperous, today it is a conflicted nation

□ **Zanzibar** — Once the Singapore of Africa, it is trying to recover its past glory

**B**asically, today West is coming to East for outsourcing of services and products and for the vast market potential, while people from East are going to West for better financial prospects, and are contributing substantially to the economies of both East and the West. As a whole, East is rising again. "Futurologists now all agree that China and India will come to dominate the global economy sometime in this century — the main reason being the low-costs and high output offered by them", notes *Time*.



## TKDL in Time

### The Turmeric Battle

"Housewives have been using turmeric for centuries. It's outrageous that someone would try and patent it", says Mr Gupta. So when two U.S.-based researchers were awarded a patent in 1995 on turmeric's special wound-healing properties, a collective howl of outrage arose from the subcontinent. The patent was eventually revoked, after a decade-long battle...

### Danger to Ayurveda

India's traditional medicine is under attack. Not just from medical marauders taking a shortcut to the next blockbuster drug by using ancient remedies, but from modernity itself. A new generation of Indians has turned from Ayurveda to Western drugs that are cheaper and work faster. Many of the foraged plants, like bitter snake gourd-good for treating digestive disorders-are disappearing along with forest habitats. Meanwhile, Western countries have embraced Ayurveda as an alternative to conventional medicines, placing additional strains on already dwindling supplies of rare plants.

### TKDL Ayurveda

So far, some 140,000 treatments have been entered into the Traditional Knowledge Digital Library (TKDL), a \$2 million project launched five years ago to provide a direct link to what is regarded in the patent world as prior knowledge.

### Magnitude of Piracy

Gupta scrolls through a list of some 5,000 applications currently pending approval by U.S. and European patent offices, jabbing a finger at the most egregious examples of what he considers to be outright theft. He estimates that at least half of those scientific "discoveries" are established remedies in India's ancient plant-based medical system, called Ayurveda. To Gupta, each application is a jewel plundered from India's vast trove of medicinal knowledge. "If this isn't piracy, I don't know what it is," he says.

### Ayurveda — A Rich Medical System

Traditional remedies have long been a rich resource for pharmaceutical companies. Quinine, a treatment for malaria, comes from the bark of the cinchona tree and was an ancient Peruvian cure. But Ayurveda is different: most of its medicines are based on multiple herbs that work in concert. Ayurvedic doctors didn't just prescribe herbal cures; they documented the individual properties of each ingredient as well as how it worked in conjunction with others. "Ayurveda is the accumulation of thousands of generations' worth of knowledge," says Gupta. "But we have to modernize in order to mine it."

### The Impact

The first of its kind, the TKDL is serving as a model for countries such as Brazil and China, which also want to safeguard traditional healing systems. Once recorded, patents on existing remedies cannot be awarded.



## Central Scientific Instruments Organisation, Chandigarh

### R&D Highlights

**T**HE Central Scientific Instruments Organisation (CSIO) Chandigarh is a premier national laboratory dedicated to research, design and development of scientific and industrial instruments. CSIO has been actively engaged, over the years, in the development of instruments in close association with apex bodies such as space, defence and health. In terms of its R&D accomplishments, CSIO continued to make discernible impact. Highlights of a few major programmes:

**Agro and Geo-scientific Instrumentation:** In agro-based Instrumentation, monitoring of moisture content in grains, cereals, fertilizers, tea, tobacco, etc. is important for their storage and quality. CSIO has successfully developed a digital moisture probe for application in grain markets.

Unleveled agricultural fields need more water for irrigation after ploughing. The CSIO's development



Digital Moisture Probe

of laser guided land leveling system aims at optimizing utilization of water resources, increased productivity with a radial distance coverage of 150 m without sunlight.

Bamboo is an economic resource for sustainable development and livelihood, particularly in the North-east region. Therefore, it is considered as 'Green Gold'. Government of India has launched a National Mission on Bamboo Technology and Trade Development. CSIO, in its endeavour to serve this sub-sector has successfully developed low-cost bamboo processing machines – Bamboo Knot Removing & Silvering Machine and Bamboo Splitting Machine. The machines will find wide applications in industry where bamboo is used as the raw material.

**Medical Instrumentation:** In medical instrumentation, first indigenous 6 MeV Medical Linear Accelerator has been developed through collaborative efforts of CSIO, SAMEER and PMT. The machine, developed under the sponsorship of the Department of Information Technology under *Jai Vigyan Programme* of Government of India, will be installed at Mahatma Gandhi Institute of



Bamboo Knot Removing and Silvering Machine

Medical Sciences, Wardha. It is well established now that cure rate of cancer afflicted patients through Medical Linear Accelerator is far better than that by the cobalt machine besides the other concomitant advantages of the former.

**Cockpit Instrumentation:** CSIO has established its credentials in cockpit instrumentation particularly for combat aircraft, Hindustan Aeronautics Limited (HAL),



Bamboo Splitting Machine



6 MeV Medical Linear Accelerator-JV1



Real Time Sound Analyzer

which gave comparable results as obtained by Track Recording Coach, being currently used by Indian Railways.

### Business Promotion/MoUs signed

The year also saw spurt in business development activities. A CSIO-Industry Meet organized jointly with Rajasthan State Industrial Development and Investment Corporation Ltd (RIICO) at Jaipur for promotion of agro-based instrumentation was an astounding success. The

meet paved way for an MoU for the creation of three agro-test laboratories in the food parks being

Bangalore, reposed its confidence in CSIO by sponsoring the development of Head Up Display for Hindustan Jet Trainer (HJT) and Advanced Jet Trainer (AJT) aircraft. Besides reduction in weight and volume, this HUD will incorporate Electronic Stand by Sight (SBS) feature to guide the pilot for combating and landing in case of mission computer failure.

During AERO INDIA - 2005, the air show held in Bangalore in February 2005, CSIO's HUD was installed in TD-2 and PV-1 combat aircraft. It is gratifying to note that CSIO's HUD has been successfully flown in more than 400 flights.

Yet another milestone in the area was the successful development of fire safety sensors of the combat aircraft to check sudden overheating of the engine or any other system. The development complied with the required qualification test of MIL grade specifications.

**Analytical Instrumentation:** A Real Time Sound Analyzer was developed and the technology was ready for transfer. It monitors noise intensity and would help evolve

means to bring it within threshold levels.

The microcontroller based coefficient of haze and dust mass monitor developed by the institute is useful to assess dust concentration in air which is one of the key parameters in Index of the Quality of Air (IQUA).

In the domain of energy management instrumentation, an online energy monitoring and control system (EMCS) was developed under a programme sponsored by DST and commissioned at Boiler Auxiliaries Plant of Bharat Heavy Electricals Ltd (BHEL), Ranipet. The system resulted in significant energy savings in the production units.

An Oscillation Monitoring System (OMS) was developed with the support of RDSO, Lucknow for assessing the safety of railway tracks and vehicles. An engineered model of OMS was handed over to RDSO for performance trials



Cockpit view of LCA with CSIO HUD



Coefficient of Haze and Dust Mass Monitor



established by RIICO.

CSIO has good expertise in high precision single point diamond turning (SPDT) and precision metrology for super precision components. The institute signed an MoU with BARC, Mumbai, for undertaking feasibility study for the development of super precision components with nanometric finish.

### Training Programme

The Indo-Swiss Training Centre (ISTC) under CSIO received a shot in the arm when the National Board of Accreditation (NBA) awarded accreditation status to the three diploma level programmes being regularly conducted at ISTC. These are: Advanced Diploma in Mechatronics and Industrial Automation, Advanced Diploma in Die and Mould Making and Diploma in Instrument Technology. It was gratifying to note cent percent placement of the passing out graduates, which demonstrates the credibility of the institute in the industry.

### Publications and Patents

CSIO scientists are becoming increasingly conscious of IPR and publications. During the year, 2004-05 three foreign patents were granted and 26 were filed, including 14 abroad. Twenty-two papers were published in different national and international journals with a good Impact Factor. Besides, 42 papers were presented in national and international conferences/symposia.

### Honours and Awards

Dr R. P. Bajpai, the then Director, CSIO, was honoured with Panjab Ratan Award at the Punjab and Haryana State Intellectuals Conference. Dr A. K. Aggarwal, the then Scientist G and Head, was selected as Emeritus Scientist on superannuation. The Indian Society for Advancement of Materials and Process Engineering (ISAMPE), Bangalore, awarded its annual K. Suryanarain Rau Memorial Award for Smart Technology Development for the year 2004. The award was presented to the team, comprising Dr R. P. Bajpai the then Director, CSIO; Dr A. K. Aggarwal, the then Scientist G; Shri N.S. Mehla Scientist F and Shri Subash C. Jain, Scientist EII, during the 18<sup>th</sup> Annual General Meeting of ISAMPE held at the National Aerospace Laboratories (NAL), Bangalore.

## CSIO signs MoUs with Banasthali Vidya Peeth, Rajasthan and Kurukshetra University

**T**HE Central Scientific Instruments Organization (CSIO), Chandigarh, has signed Memoranda of Understanding with Banasthali Vidya Peeth, Rajasthan and the Kurukshetra University.

The MoU with Banasthali Vidya Peeth aims to promote academic and research co-operation between the two institutes. The identified areas of cooperation are: instrumentation, advance signal processing and soft computing, embedded system applications and fibre-optic based system.

Also, CSIO and Banasthali Vidya Peeth (B.V.) will undertake joint research work in the identified areas of mutual interest. Joint sponsored and consultancy projects will be undertaken with both long term and short term goals and training to the staffs, student and technical persons within the identified areas of co operation. The concerned scientists of CSIO and the faculty members of B.V. will formulate research projects and HRD plans for the joint work.

Similarly, the objective of the MoU with Kurukshetra University is to promote joint research work and human resource development. The areas identified include: analytical instruments, medical instruments and virtual and intelligent instrumentation, material growth and characterization for semiconductors, observational seismology etc.

According to the MoU 10-15 selected post-graduate students from KU can pursue research work at CSIO. CSIO scientists can be registered for Ph. D. programmes at KU with joint supervision, on emerging areas of research and applications.

The MoU will help in building stronger linkages between academia and R&D institutions towards quality manpower generation and utilization in various niche areas. Similar MoUs in other areas are underway with other institutions also.



## NGRI's collaboration with Sri Venkateswara University, Tirupati



Exchange of MoU documents between Sri Venkateswara University, Tirupati and NGRI by Dr. V.P. Dimri, Director, NGRI (Second from left) and Prof. S. Jayarama Reddy, Vice Chancellor, Sri Venkateswara University, Tirupati

**I**n view of the excellent facilities, expertise and wide experience in the field of Geophysical sciences available at the National Geophysical Research Institute (NGRI), Hyderabad, Sri Venkateswara University (SVU), Tirupati, has approached NGRI for collaboration in the areas of teaching, research and training in selected and advanced thrust areas of S&T with special

reference to earth sciences. The SVU also desires to have collaboration in the area of intellectual property rights, consultancy R&D academia partnerships, technology management and technology transfer and any other area of mutual interest

NGRI and S.V. University will enter into detailed agreements on case-to-case basis with defined objective, scope of work and

mutual obligations, terms and conditions, financial arrangements, intellectual property rights and similar contractual obligations. NGRI will permit the use of its equipment, facilities, manpower to the University for executing a project. NGRI S.V.U. will work out cost sharing jointly through a separate agreement as per the CSIR guidelines. MoU would remain valid for a period of two years.



### CGCRI, Khurja Centre's efforts towards development of White Ware Clusters

**T**HE Central Glass & Ceramic Research Institute's (CGCRI's), Khurja Centre is engaged in the development of Khurja White Ware Clusters in Uttar Pradesh as a nodal R&D institution. Khurja is a pottery town in the district of Bulandshahr in Uttar Pradesh, having the largest agglomeration of small and medium scale ceramic industries in India. Cluster survival depends on the major factors such as fuel efficiency, improved productivity, good market practices, excellent house keeping, attractive designs/shapes and world class quality at competitive prices.

With a view to developing highly energy efficient method by improving the fuel efficiency in oil fired continuous tunnel kilns, CGCRI Khurja Centre approached the Executive Director and Joint Secretary, Petroleum Conservation Research Association (PCRA), New Delhi, for financial support. CGCRI and RDCIS, SAIL-Ranchi worked together to modify the tunnel kiln of two SMEs. It resulted in the fuel saving of 12-18% and productivity improvement of 30-34%.

Also, CGCRI Khurja Centre took initiative to plan an exposure tour of representatives from 21 SMEs to CGCRI, Naroda Centre, Thangarh and Morbi, to show them the better operating practices in crockery and tile industries and the benefits accruing from these. The representatives from SME's from different industries visited the Gujarat cluster under financial support of PCRA. Dr L.K. Sharma, Scientist-in-Charge, explained to them the improved techniques in the areas concerned, particularly with regards to automatic control of kilns, fuel savings, cost reduction approaches (high productivity and reduced rejections, etc.). Dr K. N. Maiti, Scientist-in-Charge, CGCRI Naroda Centre, explained the highlights of developments of Gurajat Ceramic Clusters. The representatives from SMEs were exposed to new kilns, technologies, clay washing plants, ceramic colour manufacturing, waste operated gasifiers (low cost fuel) and gained lot of experiences under the guidance of Dr C. S. Prasad, Technical Officer and Shri K.C.

Singh, Cluster Development Executive. As per the feedback after one-week tour the visitors from the industry expressed that they would attempt the following improvements, modification of kiln design; use of low thermal mass kiln furniture; use of granulating semi auto machine for making the kit; improvement in house keeping; and operating practices to improve the quality.

Based on the outcome of first trip, CGCRI Khurja Centre, planned another trip for a batch of representatives from 25 new SMEs with financial assistance of DC (SSI) to the CGCRI Naroda Centre, National Institute of Design, Ahmedabad, Thangarh and Morbi. They were exposed to nine ceramic industries. All the participants are now looking for the creation of new designs and have developed contacts with the SMEs of Thangarh and Morbi machinery manufacturers and raw materials suppliers. Mutual interaction of the SMEs will be helpful to fill up technological gaps and show overall development of ceramic industries of Khurja.



Khurja SMEs Teams at CGCRI Khurja Centre before departing for Gujarat : Left: First Exposure Visit Team; Right: 2nd Exposure Visit Team



## Training Programme on Low-cost Fish Feed Production at Bhandara

**T**HE National Environmental Engineering Research Institute (NEERI), Nagpur, organized a training programme on Low-cost Fish Feed Production based on byproduct and nutritionally rich waste, at Bhandara District Central Co-operative Bank, Bhandara. During the training programme Dr T. Chakrabarti, Director Grade Scientist, NEERI; Dr T.K. Ghosh, Deputy Director, NEERI; Dr G.V. Mulmuley, Scientist, NEERI; Shri M.S. Gaikwad, Assistant Director of Fisheries, Bhandara; Shri R.L. Lonkar, District Fisheries Development Officer, Bhandara; Shri

S.S. Tayade, AGM (DD), NABARD, Bhandara and Dr P. Malgave, Director, Bhandara District Central Co-operative Bank, Bhandara were present.

The training programme was the follow-up of the studies conducted at NEERI under a Department of Biotechnology, Government of India's sponsored project aimed at formulating fish feeds comprising cheaply available waste-based ingredients and also to improve the quality of the conventional feed, used by pisciculturists.

Inaugurating the programme, Shri S.S. Tayade, expressed that

setting of such units in the rural sector would elevate the economic status of the backward classes in the region. Shri M.S. Gaikwad, Shri R.L. Lonkar and Dr P. Malgave lauded the work done by NEERI for the development of the low-cost technology, and encouraged the group of 51 trainees to adopt the technology for expansion of fisheries sector in the region.

Dr T. Chakrabarti, in his keynote address explained the background of the project, the objectives of which was the conversion of waste to wealth, and benefits to the local people. Dr T.K. Ghosh, the Project Leader, discussed



Training programme on Low-cost Fish Feed Production at Bhandara in progress



the requirements of the nutrients by the fish for their proper growth and reproduction. The technology developed by NEERI using byproducts and nutritionally rich waste material reduces the cost of fish feed production substantially, thereby increasing the margin of profit in aquaculture, he added. Dr G.V. Mulmuley, deliberated on the ingredients used in the low-cost fish feed, and explained and demonstrated the operation of machineries. He has also provided information regarding project cost, market and marketing, and financial schemes for funding.

A brochure on the technology, methodology, economics etc. was also released on the occasion for free distribution to all the trainees.

There was overwhelming response from all the 51 participants who belonged to SC/ST category. The trainees ensured that they would take up this technology for propagation of pisciculture in this region and also for their income generation. Dr Santosh Zargar, Project Fellow, NEERI, who successfully organized the programme proposed the vote of thanks.

## Prof. Grubbs delivers NCL Foundation Day Lecture



Professor Robert H. Grubbs, delivering the Foundation Day lecture at NCL

**P**ROFESSOR Robert H. Grubbs, Nobel Laureate (Chemistry-2005), Victor and Elizabeth Atkins Professor of Chemistry, California Institute of Technology, USA, delivered the NCL Foundation Day lecture on 'Chemistry develops drugs, bugs and bats' at the National Chemical Laboratory (NCL), Pune. The lecture organized under the auspices of NCL Research Foundation (NCL RF) was a part of NCL's 56<sup>th</sup> Foundation Day celebration held in the recent past.

Organic synthesis is a multi-disciplinary science where there is an increasing demand to make molecules with desired properties. This synthesis of molecules requires very efficient and reliable tools that can bring the required bond formations or bond disconnections at defined places. Olefin metathesis is one such reaction where the synchronization of bond making and breaking brings 'change-place' of the atoms.

Prof. Grubbs started his presentation with a chronological development of the

origins of the olefin metathesis reaction starting from simple Lewis acid mediated dimerization of ethylene, the work carried out by earlier scientists in the area of polymerization of cyclopentene and norbornene which triggered the development of various polymer forming reactions and catalysts, thereby, leading to an understanding of the mechanism of the reaction. Normally synthetic chemists develop chemical reactions and polymer chemists utilize them for polymerization. This is one of the very few instances where a new reaction was developed by polymer chemist and has been widely utilized by organic chemists. He also elucidated how the mechanism of this reaction was demonstrated by Prof. Chauvin of France with whom he shared the Nobel Prize in chemistry for the year 2005.

The fundamental knowledge of the mechanism of the reaction along with the knowledge of the properties of the metals helped Prof Grubbs to design new thermally and chemically stable catalysts, thereby, contributing vastly to the area of organic synthesis and polymer science. The ability to tune the catalyst structure and design practically useful catalyst for olefin metathesis reactions has placed Prof Grubbs above his contemporaries in the area of application of well defined organometallic catalysts for organic synthesis.

Prof Grubbs explained that the word 'metathesis' means 'change-places'. In metathesis reactions, double bonds are broken and made between carbon atoms in ways that cause atoms to change places. This happens with the assistance of specially designed catalysts. He compared the efficiency of several catalysts used for metathesis reaction in terms of reactivity, stability and functional group tolerance



and demonstrated the superiority of the ruthenium (Ru) based catalysts. He traced the development of different generations of Ru catalysts and highlighted the influence of ligands in increasing reactivity by several orders of magnitude. The N-heterocyclic carbene based ligands appear to be one of the best. These catalysts can also be made in kilo quantities.

In the second part of his lecture Prof Grubbs illustrated several applications of olefin metathesis reaction in chemistry. Ring opening metathesis polymerization of dicyclopentadiene leads to polymer with unique properties. The polymer finds applications in armours for military purposes. This polymer is also used for strengthening the wooden baseball bats performing the polymerization reaction within the pores of wood. This imparts tremendous strength to the wood and is used in commercial manufacture of baseball bats and wood coating. Olefin metathesis reaction is useful for the synthesis of pheromones which can either attract or repel bugs and can be used for pest management. The unique advantage and effectiveness of the catalyst system in the manufacture of some drugs was exemplified. This included a molecule scaffold of Merck which can be made in three-step by employing ring closing metathesis reaction as against 20-step by conventional chemistry. Similarly, a 15-membered macrocyclic drug by Boehringer Ingelheim for the treatment of Hepatitis C was

manufactured commercially on a 400 kg scale using a ring closing metathesis reaction. A drug for the treatment of osteoporosis is under development on a large scale by GSK Inc. using ring closing metathesis as the key step.

Several awards including Scientist of the Year Award (Sponsored by Maneckji & Shirinbai Neterwala Foundation), highest Industrial Earning Award in the form of Rotating Shield & Trophy and Director's Commendation Award and Individual Merit Awards were given on the occasion at the hands of Prof. Grubbs.

Earlier, Dr S. Sivaram, Director, NCL, welcomed the audience. He briefly traced the history and chronology of NCL since its inception. While introducing Prof. Grubbs to the audience Dr Sivaram described him as an organo-metallic chemist of great distinction and a person who has made pioneering contribution to the science of catalysis. If one looks at the contribution of Nobel Prize winners during the past one hundred years, 1901 to 2005, Dr Sivaram pointed out, approximately 25% prizes have been awarded to those individuals who discovered new ways to make carbon – carbon bonds. Prof. Grubbs joins those distinguished line of chemists whose contributions to the making of C-C bond has been recognized by a Nobel Prize.

A large cross-section of post-graduate students of chemistry from local colleges and University of Pune attended the lecture

## Prof. Peter Liss delivers NIO's fifth 40<sup>th</sup> Foundation Year Lecture



Prof. Peter S. Liss delivering the 40<sup>th</sup> Foundation Year Lecture at NIO

PROF. Peter S. Liss from the School of Environmental Sciences, University of East Anglia, Norwich, UK, delivered 40th Foundation Year Lecture on 'Global Change and the Oceans' at the National Institute of Oceanography (NIO), Goa, recently. His was the fifth lecture in this series. In this lecture Prof. Liss described how the oceans interact with the atmosphere and exchange various elements that are important in global biogeochemical processes and climate change. The exchange of greenhouse gases (GHGs) like carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), dimethylsulfide (DMS), volatile organo-halogen compounds (VHOC), etc, take place at the ocean-atmosphere interface. The oceans, which form a natural sink for atmospheric carbon, are failing to absorb

elevated emissions of CO<sub>2</sub> mainly due to the increased burning of fossil fuels during post-industrialization period. He expressed serious concern on elevated atmospheric CO<sub>2</sub> levels that alter the chemistry of oceanic waters and strongly influence the health of organisms in the oceans. Based on laboratory and mesocosm experiments by his group, the impacts of elevated CO<sub>2</sub> concentrations have indicated negative effects on calcite bearing organisms in the oceans and on the growth of phytoplankton like coccoliths. An increase in the primary production may also result in greater emission of organo-sulfur compounds like DMS that are considered important in the formation of cloud condensation nuclei (CCN) and reducing the earth's surface temperature.

Prof. Liss described a model to study the impact of such elevated DMS levels on global temperatures highlighting the field observations made by the National Institute of Oceanography, Goa, of high DMS levels and their impact on atmospheric chemistry. Phytoplankton and macroalgae are also important producers of VHOC, which are potent GHGs. However, some of the VHOCs like iodine are also known to be essential for maintaining good health in humans. His talk highlighted the significance of these elements and micronutrients like selenium on the health of the coastal population and indicated that fertilization of oceans with micronutrients like Fe<sup>3+</sup> is an important method to mitigate the levels of atmospheric carbon. An iron-fertilized ocean is believed to increase carbon fixation, resulting in increased down ward flux and sedimentation of organic carbon, and an increase in the carbon dioxide draw-down thus lowering the atmospheric CO<sub>2</sub> levels. Finally, he discussed various studies coordinated under the aegis of SOLAS (Surface-Ocean Lower Atmosphere Study).

Dr Dileep Kumar, Scientist, NIO, while welcoming Prof Liss, outlined his achievements and Dr Lata Raghukumar proposed the vote of thanks.

## CIM – Utsav at CIMAP

**T**HE Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow, organized its Annual Farmer's Fair CIM-Utsav (*Kisan Mela*), to equip the participants with modern skills of the cultivation of economically important medicinal and aromatic plants. More than 1500 participants, mostly farmers, took part in the *mela*, and participated in various activities organized on the occasion.

In his welcome address, Dr S.P.S. Khanuja, Director, CIMAP, told that CIMAP has emerged as a pioneer institution in technology development for rural empowerment in true sense through its R&D work. Today the herbal based products are gaining popularity all over the world and the time has come that farmers should also take advantage of such scenario by producing quality herbs and



Dr S.P..S Khanuja, Director, CIMAP addressing the distinguished gathering

plants – the input material for any herbal/plant-based pharma industry utilizing technology from CIMAP. He highlighted the work undertaken by CIMAP through its unique bio-village mission approach for popularization of geranium, mints, patchouli, and *Artemisia annua*. Dr Khanuja told that for the first time the *Artemisia* variety - CIM-Arogya has been licensed to five major companies of the country and two companies are involving about one thousand five hundred farmers in cultivation of anti malarial drug plant *Artemisia annua* in various



A section of the participants



Participants showing keen interest in CIMAP's herbal products

districts of Uttar Pradesh and Uttranchal. As per the parliamentary Committee report "this type of *Kisan Mela* has significant influence in terms of augmenting rural awareness and such *Melas* should be organized in other places more frequently".

Dr Khanuja said that continuing efforts made by CIMAP have made visible impact, specially in rural areas, and CIMAP has been awarded FICCI award by the Prime Minister of India as national recognition to the CIMAP's effort in the area of rural development.

The Guest of Honour on this occasion, Prof. Chandrika Prasad, DG, UPCAR, and Prof. P.K. Seth, CEO, Biotech Park, Lucknow, also addressed the gathering and released souvenir of CIM-Utsav (*Gyanya*) and second issue of the magazine *Aus boond* and *MAPs dew* besides the latest issue of *JMAPS*.

Chief Guest Shri Naveen Chandra Bajpai, Agriculture

Production Commissioner, Uttar Pradesh, in his lecture called upon the farmers to adopt CIMAP'S technologies to increase their income. He said that integration of medicinal and aromatic plants with existing cropping system is necessary so that overall production of food grains is not adversely affected. Dr A.K. Singh, Head, Technology Transfer Division, conducted the proceedings.

Other highlights of the CIM-Utsav were a question answer session, '*Know Artemisia*' stall to educate the farmers about the anti-malarial drug plant, plant health and plant identification competition, display and sale of improved plant varieties and newly developed rose oil distillation unit, *CIM Asvika*. A starter kit, *Navankur*, was provided to the participants who desired to start cultivation of medicinal and aromatic plants. Prizes were also awarded to the winners of various competitions organized on this occasion.

## Dr M. Deepa receives G. C. Jain Memorial Award



**D**R M. Deepa, Scientist, National Physical Laboratory (NPL), New Delhi, has won the G. C. Jain Memorial Award for the best Ph. D. thesis in Materials Science for the year 2005. Dr Deepa, is presently working on electrochromic materials and devices in the Electronic Materials Division. Her Ph. D. has been an outcome of work done in the field of lithium ion conducting polymeric gel electrolytes. This award carrying a citation from MRSI along with a cash prize of Rs 6000, was given to her by the Materials Research Society of India in the Annual General Meeting of MRSI held recently at Lucknow.



### RRL Bhopal gets National Award for Fly Ash Utilization

**T**HE Regional Research Laboratory (RRL), Bhopal, has been awarded the National Award in recognition of the exemplary work done in the area of Fly Ash Utilization. RRL-Bhopal has made significant contribution to the R&D work on use of fly ash for building components, agriculture and value added products. The award was jointly conferred at the laboratory by Ministry of Power, Ministry of Environment and Forests and TIFAC, DST, Government of India, during the International Congress on Fly Ash Utilization held recently in New Delhi.

RRL-Bhopal has carried out extensive research on use of fly ash in developing cost-effective alternative building materials (blocks, bricks, paint), fly ash filled polymers composites (wood



Dr N. Ramakrishnan, Director, RRL, Bhopal, receiving the award. Seen (from left) are: Shri Kapil Sibal, Minister for Science & Technology and Ocean Development; Shri P.M. Sayeed, Minister of Power; and Shri N.N. Meena, Minister for Environment and Forests

substitute materials) and developed processes for vermi-compost and bulk utilization of fly ash in

increasing the agricultural productivity. All these materials/processes have massive potential for the utilization in the livelihood development of rural sector in a sustainable manner.

In addition, RRL-Bhopal, has been actively involved in process development for value-added materials through fly ash beneficiation, fly ash classification. Attrition milling of fly ash for reactivity improvement, cenosphere extraction and development of light weight materials with special properties and for immobilizing and recycling hazardous wastes in developing value-added products using fly ash.

The laboratory is also actively involved in propagation of the above uses among the masses.



The award-winning team: Dr N. Ramakrishnan, Director, RRL, Bhopal, with his team of scientists.



## Dr Baban Ingole awarded Marathawada Gourav

**D**R Baban Ingole, a scientist in Biological Oceanography Division at the National Institute of Oceanography (NIO), Goa, has been awarded the 'Marathawada Gourav' award this year for his significant contributions to the field of Marine Science and for popularization of science. The award was presented at Ravindra Natyamandir, Mumbai during a special function organized by Marathawada Lokawikas Manch,



Dr Baban Ingole, with his award

Mumbai, affiliated to the Ministry of Cultural Affairs, Maharashtra. Dr Ingole received the award at the hands of Shri Babanrao Patchpute, Minister of Forests, Maharashtra, in the presence of Smt. Suryakant Patil, Minister of State for Rural Development, Government of India.

Dr Ingole has over 25 years of research experience in applied aspects of varied ecological habitats like estuaries, salt marshes, intertidal areas, coral reefs, seagrasses, deep-sea and the Antarctic Ocean studies. He has received many honours and awards including the Young Scientist Award in 1994, Shri D.B. Vikaji Taraporewale Fellowship, and Japanese Government (MOMBUSHO) fellowship for his post doctoral studies during 1989-91. He recently participated in the 'Sumatra Earthquake and Tsunami Offshore Survey (SEATOS)' – an international research activity. He has 78 research papers in international and national journals and filed four patents

## Dr C. Mohandass receives Biotechnology Overseas Associateship Award 2005-06

**D**R C. Mohandass, Scientist at the National Institute of Oceanography (NIO), Goa, has received Biotechnology Overseas Associateship Award for the year 2005-06 from Department of Biotechnology, Government of India. This award permits Dr Mohandass to work for a term of six months at the Institute of Paper Science and Technology (IPST) at Georgia Institute of Technology, Atlanta in United States. He would be associated with Dr Arthur Ragauskas, Scientist at the International Academy of Wood Science Fellow at IPST. Dr Mohandass intends to work on Modern Biotechnological aspects of biological deinking during his fellowship. This is in continuation of the work that he is already involved in at NIO under marine biotechnology project.

Dr Mohandass has 12 research publications in most prestigious journals and two international patents. He also participates in the sponsored projects and has contributed his expertise to 15 project reports.



## Honours & Awards

### Dr (Smt.) E.C. Malaimani elected Member-at-Large in GGOS

**D**R-Ing (Smt) E.C. Malaimani, Scientist 'F', National Geophysical Research Institute (NGRI), Hyderabad, has been officially confirmed as Member-at-Large in GGOS (Global Geodetic Observing System) Steering Committee of the International Association of Geodesy (IAG), USA. It is, for the first time that an Indian is occupying this prestigious position.

It is IAG's contribution to Earth Sciences and bridge to the other disciplines; it asserts the position of geodesy in geosciences, integrates the work of IAG and emphasizes the broad spectrum of geodetic research and application fields. GGOS integrates different geodetic techniques, models, and approaches in order to ensure a long-term monitoring of the geodetic observables in agreement with the Integrated Global Observing Strategy (IGOS). GGOS provides the observational basis to maintain a stable, accurate and global terrestrial reference frame, to link it to the celestial reference frame and to monitor the Earth's kinematics and dynamics. In this function GGOS is crucial for all Earth observations and many practical applications. GGOS contributes to the scientific and infrastructure basis for all global change research in Earth sciences. In the frame of GGOS, the Earth system is viewed as a whole, the solid Earth as well as the fluid components, the static as well as time-varying quantities.

### Dr S. S. Rai gets National Mineral Award

**D**R Shyam Sunder Rai, Scientist F at the National Geophysical Research Institute (NGRI), Hyderabad, and a Senior Associate at the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy, has been honoured with the National Mineral Award 2004 by the Union Minister of Mines Shri Sis Ram Ola, for his research contributions to the development of new approaches, design and execution of experiments and modelling of geophysical measurements



Dr S. S. Rai, Scientist NGRI, receiving the National Mineral Award at the hands of the Union Minister of Mines Shri Sis Ram Ola

in the areas of seismology and geo-electromagnetism for mineral exploration and investigation of the deep structure of India. He blended the recent advances in data acquisition and mathematical simulation to infer the deep geological processes, based on geophysical images, generated at various scale lengths in segment of India. Dr Rai did his M.Tech. in Applied Geophysics from IIT, Roorkee and obtained his Ph.D. from the Indian School of Mines, Dhanbad. He heads the Seismic Tomography program at NGRI. He has published over 50 peer reviewed research papers in international and national journals. Dr Rai is recipient of several prestigious awards including the S.S. Bhatnagar Prize, CSIR Young Scientist Award, and M.S. Krishnan medal of the Indian Geophysical Union. He is a Fellow of the Indian Academy of Science and the National Academy of Science, India. Currently, Dr. Rai is leading an ambitious project under the National Mission Programme in Seismology of DST, to image the Himalaya in order to understand its internal making and to accurately define the seismically potential regions

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