NEWS AT A GLANCE

Forthcoming Events:

*April 27-28, 2017
4th International Conference on Geology and Geoscience
"Exploring the Recent trends and analytical techniques in the field of Geology and Geosciences".
DUBAI, UAE. For details Email-geology@conferenceseries.net

*RSCy2017 — Fifth International Conference on Remote Sensing and Geo-Information of the Environment
20 Mar 2017 - 23 Mar 2017; Paphos, Cyprus
"Remote Sensing Applications, Geo-information, Geophysics, Remote sensing & geo-information in education, Ecosystems, Environment and Sustainable Development"
website: http://www.cyprusremotesensing.com/rscy2017/

*Association of Petroleum Geologists Annual Convention and Exhibition 2017
02 Apr 2017 - 05 Apr 2017; Houston, United States
"Petrophyscis , Petrochemistry and Petrochemical Industry"
website: http://www.aapg.org/events/conferences/ace/announcement/articleid/5663/aapg-2017-annual-convention-exhibition

*Engineering Geophysics 2017 Conference and Exhibition
24 Apr 2017 - 28 Apr 2017; Kislovodsk, Russia
website: http://www.eage.org/event/index.php?eventid=1508&Opendivs=s3

*Vernacular, Life-Style, Architecture, Design, and Place-making — TRIKONA Conference: VERNACULAR
03 Mar 2017 - 05 Mar 2017; Cheyyur Taluk, Kancheepuram District, India
"Architecture, Disaster-Management, Resilience, Sustainability, Engineering (general), Civil Engineering".
website: http://www.midas.ac.in

Scientific and Technology related news

***Prime Minister Narendra Modi moots Scientific Social Responsibility**

While inaugurating the 104th Indian Science Congress on 3rd January, 2017 at Tirupati (A.P.) Narendra Modi said as in the case of Corporate Social Responsibility, the concept of Scientific Social Responsibility needs to be developed to connect leading institutions to all stakeholders, including schools and colleges. He re-iterated that National Laboratories should connect with schools and colleges to develop appropriate training programmes. He is of the opinion that we have to develop innovative ideas focusing on societal needs. While appreciating India has become 6th in the world as far as scientific publications as per the SCOPUS data base of peer-reviewed literature from science, he wanted scientists to focus on scientific studies of societal importance at par with basic and application oriented basic sciences. (**Source**: 4th January issue of Deccan Chronicle).

I have mentioned in number of editorials the need to spare some of the valuable time to address various types of problems faced by the common man, due to non implementation of scientific procedures.

***CSIR-NGRI to identify underground sewer leakages in the twin-cities**

The Metro Water and Sewerage Board is working with CSIR-NGRI to identify underground sewer leakages by using Ground Penetrating Radar Technology. This has become essential as roads have caved in forming large craters (sink holes) at three different places in Hyderabad due to collapse of sewerage and water supply pipes. NGRI has requisite technical knowhow and experience, which would help to detect land subsidence zones/areas. NGRI will deploy technically qualified team of experts to study vulnerable pipe lines. (**Source:** 3rd January issue of Deccan Chronicle)

NGRI earlier extended its help in lessening pollution in number of lakes present within GHMC limits.

Science News

***Groundwater Contamination in Karst Regions Affects Human Health**

Some characteristics of limestone aquifers, in contrast to porous media, make them particularly susceptible to contamination. Sinking streams and sinkholes provide a rapid route for unfiltered contaminants from the land surface to the underlying aquifer. This characteristic,

along with swift groundwater flow in conduits that have been widened by mineral dissolution (karst aquifers) and difficulty characterizing and monitoring the highly heterogeneous karst subsurface, contributes to an elevated risk for degradation of water quality. The reliance on groundwater for drinking supplies in karst regions creates the potential for public health effects. The non profit Karst Waters Institute of Virginia State, USA held an interdisciplinary conference (http://bit.ly/ Karst-Conf) to explore knowledge gaps between the science of contaminant transport in karst aquifers and our understanding of exposure pathways and health outcomes. Seventy experts from seven countries attended. They specialized in karst hydrogeology, contaminant geochemistry, microbiology, public health sciences, and environmental law and regulation. Attendees grappled with identifying conceptual and practical obstacles while they learned of new tools, findings, and promising perspectives for protecting human health. Sessions highlighted emerging tools for investigating contaminant transport, for quantifying exposure concentrations, and for demonstrating linkages to human health outcomes. Numerous presenters demonstrated that karst is particularly prone to groundwater contamination that may undermine human health, with several studies documenting higher concentrations of bacteria and protozoa in karst than in porous media aquifers. In addition, molecular tools for tracing and identifying potential pathogens in groundwater revealed large numbers of viruses derived from humans as well as from wildlife and livestock. Most conclusions about human health outcomes are based on interpretation of public health data that are collected independent of information on the factors that exacerbate groundwater contamination. One of the studies presented at the meeting had sufficient data to link the timing of disease outbreak to the occurrence of storm flow that mobilized contaminant migration into groundwater supplies used for drinking. Participants discussed ways that general regulations for water quality protection may not be appropriate in karst regions, where contaminants are transmitted rapidly from the land surface to the water table, and they debated creative non-regulatory approaches to managing land use as another means of protecting water supplies. The significant time lag between the occurrence of water supply contamination, particularly by chemical agents, and the subsequent health outcomes in the population represents a fundamental misalignment of environmental and human data. An edited volume of research papers from the meeting is under contract for publication by Janet S. Herman, Department of Environmental Sciences, University of Virginia, Charlottesville; email: jherman@virginia.edu (**Weblink**: https://eos.org/wp-content/uploads/2016/08/01-Sept_magazine.pdf).

This study is of significant importance to Indian Karst regions as considerable amount of groundwater usage has become a necessity in these regions. It is time for our hydrogeologists and groundwater geophysicists to collect as much data as possible from Kurnool and Kadapa districts of A. P. and interact with the University of Virginia to help the large number of people residing in drought prone Karst locales of Rayalaseema.

***Bacteria Preserve Record of Earth's Magnetic Fields**

In the waters of a prehistoric ocean, a minuscule bacterium swims back and forth, seeking food. As it does so, it leaves tiny metallic particles swirling in its wake—some already present in the water column, some excreted as the bacteria's by-products. As the water churns from the motion of other bacteria, some of these particles (magnetic ones) attract each another, coalescing into larger, but still tiny, magnetized crystals of magnetite, goethite, hematite, and other minerals. These iron-rich crystals drift slowly downward to land on the ancient seabed, aligning with the Earth's magnetic field as they're buried by other sediment and eventually locked into place. A scene much like this has unfolded again recently in a glass experimental vessel holding bacteria-filled water in a Russian laboratory. A team of scientists was curious to see how large the crystals could grow and whether they could become substantial enough to maintain a stable magnetic orientation over millions, or even billions, of years. Their findings, published recently in Geophysical Journal International (see http://bit.ly/ FeBacteria), shed light on how sediments gain and retain magnetism. Answers in sludge for their study, the team used "bacteria that are taken from nature, normal groundwater bacteria," said Alexandra Abrajevitch, a paleomagnetist at the Institute of Tectonics and Geophysics of the Russian Academy of Sciences in Khabarovsk, Russia, and lead author on the study. The scientists seeded the vessel of water with iron, food, and sand. Then they waited. Two years later, when the team looked at the reddish sludge that had formed at the bottom of their experiment, they found that the sample contained large crystals of magnetite and goethite. These are stable minerals, capable of carrying a magnetic signature over long periods of time. The team also found lepidocrocite, a magnetically unstable mineral that can transform into more stable forms over time. According to the paper, tests of the sludge's magnetism revealed that it

contained a broad range of particle sizes. Some were tiny and unstable like those found in previous experiments, but many were more than 30 nanometers long, large enough to hold a magnetic direction for as long as billions of years. These particles confirmed for the researchers that given enough time, bacteria could prompt larger and larger magnetic crystals to grow in their environment, just by moving and stirring up the water and excreting iron-rich waste. In ancient waters, large particles recorded the direction of the Earth's magnetic field when they settled on the seabed. Most of the stable particles aligned with the Earth's magnetic field. Sediment settled on top of them, holding them in place. The different layers in sedimentary rock provide a continuous timeline of the shifting strength and direction of the magnetic field over time—"almost like a bar code," according to David Heslop, a geophysicist at the Australian National University in Canberra, Australia. If the common bacteria in the experiment could generate stable magnetic particles, he said, a similar process could have been happening throughout Earth's oceans, rivers, and lakes farther back in time than scientists have even looked, back when microbes first became abundant. However, Bacteria Preserve Record of Earth's Magnetic Fields Magnetic minerals, such as the dark stripes of magnetite seen in beach sand in India, can form layers in sediments. Researchers had no proof that bacteria could produce them. Because there was no proof that they could be stable, the particles were dismissed as a potential data source. But the authors of the new study say that prior researchers didn't wait long enough for the particles to mature and grow to their full size. Heslop expects that with this new knowledge in hand, scientists will be able to scan more rocks with better accuracy to find the direction of Earth's ancient magnetic field and to determine the strength of that magnetic field as well. Magnetic minerals from different sources and of different sizes vary in how readily they will align with a field, Heslop said. When researchers are looking at a rock's magnetism, they have to know either the strength of the Earth's magnetic field when the rock was formed or how responsive the magnetic alignment of that type of iron- rich particle was to the field. Knowing one can allow researchers to figure out the other. Figuring out exactly what kinds of particles the majority of bacteria produce and how strongly they align with Earth's magnetic field could help scientists refine their estimates of the strength and orientation of Earth's magnetic field in the deep geologic past. This new experiment was small, Heslop said, but its results may encourage scientists to revisit archives of sedimentary rock samples with new, more reliable information on the origins of their magnetic properties. (Source: https://eos.org/wp-content/uploads/2016/09/15-Sept_magazine.pdf)

Outstanding Contribution

M.S. Swaminathan
- Architect of "Green Revolution"

Mankombu Sambasivan Swaminathan (born 7 August 1925) is an Indian geneticist and international administrator, renowned for his leading role in India's Green Revolution a program under which high-yield varieties of wheat and rice seedlings were planted in the fields of poor farmers. Swaminathan is known as "Indian Father of Green Revolution" for his leadership and success in introducing and further developing high-yielding varieties of wheat in India. He is the founder and chairman of the MS Swaminathan Research Foundation. His stated vision is to rid the world of hunger and poverty. Swaminathan is an advocate of moving India to sustainable development, especially using environmentally sustainable agriculture, sustainable food security and the preservation of biodiversity, which he calls an "evergreen revolution".

Early career

Swaminathan decided to pursue a career in agricultural sciences. He enrolled in Madras Agricultural College (now the Tamil Nadu Agricultural University) where he graduated as valedictorian with another Bachelor of Science degree, this time in Agricultural Science. He explained this career decision thus: "My personal motivation started with the great Bengal famine of 1943, when I was a student at the University of Kerala. There was an acute rice shortage, and in Bengal about 3 million people died from starvation. All of our young people, myself included, were involved in the freedom struggle, which Gandhi had intensified, and I decided I should take to agricultural research in order to help farmers produce more."

In 1947, the year of Indian independence he moved to the Indian Agricultural Research Institute (IARI) in New Delhi as a post-graduate student in genetics and plant breeding. He obtained a post-graduate degree with high distinction in Cytogenetics in 1949.

He chose to accept the UNESCO Fellowship to continue his IARI research on potato genetics at the Wageningen

Agricultural University, Institute of Genetics in the Netherlands. Here he succeeded in standardising procedures for transferring genes from a wide range of wild species of Solanum to the cultivated potato, Solanum tuberosum. In 1950, he moved to study at the Plant Breeding Institute of the University of Cambridge School of Agriculture. He earned a Doctor of Philosophy (PhD) degree in 1952. His work presented a new concept of the species relationships within the tuber-bearing Solanum. His Cambridge college, Fitzwilliam, made him an Honorary Fellow in 2014.

Swaminathan then accepted a post-doctoral research associateship at the University of Wisconsin, Department of Genetics to help set up a USDA potato research station. Despite his strong personal and professional satisfaction with the research work in Wisconsin, he declined the offer of a full-time faculty position, returning to India in early 1954.

Professional achievements

Swaminathan has worked worldwide in collaboration with colleagues and students on a wide range of problems in basic and applied plant breeding, agricultural research and development and the conservation of natural resources. His professional career began in 1949:

Some of the important professional career particulars(out of many) are listed below

- 1972–79 – Director-General, Indian Council of Agricultural Research (ICAR), established the National Bureau of Plant, Animal, and Fish Genetic Resources of India. Established the International Plant Genetic Resources Institute (changed in 2006 to Bioversity International).
- 1979–80 – Principal Secretary in the Ministry of Agriculture, Government of India. Transformed the Pre-investment Forest Survey Programme into the Forest Survey of India.
- 1981–85 – Independent chairman, Food and Agriculture Organization (FAO) Council, Rome.Played a significant role in establishing the Commission on Plant Genetic Resources.
- 1982–88 – Director General, International Rice Research Institute (IRRI).
- 1984–90 – President of the International Union for Conservation of Nature and Natural Resources IUCN, develop the Convention on Biological Diversity CBD.
- 1986–99 – Chairman of the editorial advisory board, World Resources Institute, Washington, D. C., conceived and produced the first "World Resources Report."
- 1988–91 – Chairman of the International Steering Committee of the Keystone International Dialogue on Plant Genetic Resources, regarding the availability, use, exchange and protection of plant germplasm.
- 1988–99 – Chairman/Trustee, Commonwealth Secretariat Expert Group, organised the Iwokrama International Centre for Rainforest Conservation and Development, for the sustainable and equitable management of tropical rainforests in Guyana.
- 1990–93 – Founder/President, International Society for Mangrove Ecosystems (ISME)
- 1995–1999 chairman, Auroville Foundation
- 2001 – Chairman of the Regional Steering Committee for the India – Bangladesh joint Project on Biodiversity Management in the Sundarbans World Heritage Site, funded by the UN Foundation and UNDP.
- 2002 – President of the Nobel Peace Prize-winning Pugwash Conferences on Science and World Affairs .
- 2004 – 2014 – Chairman, National Commission on Farmers.
- Over 68 students have done their PhD thesis work under his guidance.

Publications

Dr. Swaminathan is a prolific scientific researcher and writer. In addition he has written a few books on the general theme of his life's work, biodiversity and sustainable agriculture for alleviation of hunger.

Honours, awards and international recognition

Swaminathan has received several outstanding awards and prizes.

- H.K. Firodia award for excellence in Science & Technology
- Four Freedoms Award, 2000
- Planet and Humanity Medal of the International Geographical Union, 2000
- UNEP Sasakawa Environment Prize
- The Tyler Prize for Environmental Achievement, 1991
- Honda Prize, for achieving outstanding results in the field of ecotechnology, 1991
- Padma Vibhushan 1989
- World Food Prize for advancing human development through increased quantity, quality or accessibility of food, 1987
- Golden Heart Presidential Award of the Philippines,1987
- Albert Einstein World Award of Science as a recognition for his contributions to plant genetics and his influence on international agricultural development. 1986
- Borlaug Award, given by Coromandel Fertilizers, 1979

- Padma Bhushan 1972
- Ramon Magsaysay Award for Community Leadership 1971
- Padma Shri 1967

He holds more than 50 honorary Doctorate degrees from universities around the world.

National Awards

He has been honoured with several awards in India for his work to benefit the country.

- Karmaveer Puraskaar Noble Laureates, March, 2007 by iCONGO- Confederation of NGOs.
- Dupont-Solae Award for his contribution to the field of food and nutrition security 2004
- Life Time Achievement Award from BioSpectrum 2003
- Indira Gandhi Gold Plaque by the Asiatic Society for his significant contribution towards human progress. 2002
- Lokmanya Tilak Award by the Tilak Smarak Trust, 2001
- Indira Gandhi Prize for Peace, Disarmament and Development, 2000
- Millennium Alumnus Award by the Tamil Nadu Agricultural University 2000
- Prof P N Mehra Memorial Award 1999
- Legend in his Lifetime Award by the World Wilderness Trust- India 1999
- Dr. B.P. Pal Medal, 1997
- V. Gangadharan Award,1997
- Lal Bahadur Shastri Deshgaurav Samman 1992
- Dr. J.C. Bose Medal, Bose Institute 1989
- Krishi Ratna Award, 1986
- Rabindranath Tagore Prize of Visva Bharati University 1981
- R.D. Misra Medal of the Indian Environmental Society 1981
- Barclay Medal of the Asiatic Society, 1978
- Moudgil Prize of the Bureau of Indian Standards, 1978
- Birbal Sahni Medal, 1965.
- Shanti Swarup Bhatnagar Award, 1961
- Indira Gandhi Award for National Integration of the Indian National Congress

International Awards

He has been honoured with recognition from several international organisations for spreading the benefits of his work to other countries.

Fellowships

- Indian Academy of Sciences – Elected Fellow (1957)
- Indian National Science Academy – Elected Fellow (1962)
- National Academy of Sciences, India – Elected Fellow (1976)
- Royal Society of London – Elected Fellow (1973)
- National Academy of Sciences, USA – Elected Fellow (1977)
- Russian Academy of Agricultural Sciences – Elected Fellow (1978)
- Royal Swedish Academy of Agriculture and Forestry – Elected Fellow (1983)
- National Academy of Arts and Sciences, USA – Elected Fellow (1984)
- Accad. Naz. Delle Sciencz detta del XL, Italy – Elected Fellow (1985)
- European Academy of Arts, Science and Humanities – Elected Fellow (1988)
- Am. Assn. For the Advancement of Science – Elected Fellow
- The World Academy of Sciences (TWAS) – Founder Fellow (1983)
- National Academy of Agricultural Sciences – Elected Fellow (1990)
- Swaminathan is a Fellow of the Royal Society of London, the U.S. National Academy of Sciences, the Russian Academy of Sciences, the Chinese Academy of Sciences, and the Italian Academy of Sciences.

Current work

He currently holds the UNESCO -Cousteau Chair in Ecotechnology at the M. S. Swaminathan Research Foundation in Chennai, India.

- He is the chairman of the National Commission on Agriculture, Food and Nutrition Security of India (National Commission on Farmers).

- He is currently spearheading a movement to bridge the Digital divide called, "Mission 2007: Every Village a Knowledge Centre".

- M. S. Swaminathan is also a member of the Leadership Council of Compact 2025, a partnership that develops and disseminates evidence-based advice to politicians and other decision-makers aimed at ending hunger and undernutrition in the coming 10 years.

P.R.Reddy