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National Conference on New Frontiers in Medicinal Plants Research

A Report by Dr. N.Sathyannarayana, Associate Professor, Department of Botany



At a time when the global market for natural products is witnessing an unprecedented growth on one side, and the ecological sustainability of such escalation is strongly questioned by activist's and likes, there was a need to take stock of and re-plan India's participation in this sector in relation to use of medicinal plants resources in a sustainable and equitable way, especially in biodiversity rich region like Eastern Himalayas. In this background, the three-day conference examined the emerging challenges at the local level vis-à-vis important developments at international, to get necessary insights for a coordinated and affirmative action by all the stakeholders in the state.

The conference was inaugurated, in the morning on October 3 by Sri Bhim Dhungel, Hon. Minister for Forest, Environment and Wildlife management, Government of Sikkim in the presence of over 175 dignitaries and delegates from all over the country at the pristine venue of Namgyal Institute of Tibetology, Gangtok. Padmasri Dr. P Pushpan-gadan, Former Director, NBRI gave a well illustrated inaugural address. On this occasion, Dr R R Rao, INSA Emeritus Scientist & renowned taxonomist from Bangalore and Sri Arvind Kumar, PCCF cum Principal Secretary, FEWMD, Govt. of Sikkim also briefly addressed the delegates. Vice Chancellor, Prof. T B Subba, presided over the function.

The deliberations during the Conference was focused on the following themes: (1) Taxonomy, Biodiversity & Conservation (2) Breeding, Biotechnology & Genomic Tools (3) Phytochemistry, Pharmacology & Clinical Research

(4) Bio-prospection & Herbal Drugs (5) Indigenous knowledge, Community Rights & IPR and (6) Eastern Himalayan Medicinal Plants: Prospects & Perils. Some of the prominent resource persons who participated as lead speakers & chairpersons included: Dr. Eklabya Sharma, Prof. Bhuashan Patwardhan; Dr. G C Subba, Dr. N K Singh, Dr. H K Badola, Dr. Arvind Saklani, Dr. Ravikanth, Dr. Kavita Tyagi among others.

On the final day, ie 5 October, the conference attempted to evince the grassroots challenges in the medicinal plants sector in Eastern Himalayas through an interactive meeting with the growers and herbal healers. Dr. D R Chettri, Associate Professor, Department of Botany and conference convener, coordinated this meeting. Seven prominent medicinal plant cultivators and healers from Sikkim-Darjeeling region shared their experiences on promising medicinal plants of Sikkim Himalayas & the problems associated with their cultivation; trade and marketing. This was followed by an interesting group discussion and a technical session whose speakers on the possible on roadmap for addressing the above challenges.

The conference provided a vibrant interactive platform for serious deliberations on three pressing concerns of Medicinal plants sector viz., collection, cultivation and conservation. Among the issues flagged included: global climate change and its impact on medicinal plants diversity, taxonomic problems & misidentification, genetic and phenotypic variability, instability, toxic components & contaminants in herbal extracts etc. In all, 16 plenary lectures covering 9 thematic sessions; 31 paper presentation, 6 Young Scientist's presentations and more than 65 poster presentations were witnessed during the three day's event. On 4th October, the staff and students of the Music department, Sikkim

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University presented a vivacious cultural program that got wide appreciation from all the participants.

The valedictory program was held on the afternoon of 5th October, 2013 wherein Sri Dibakar Kanunjna, Advisor-Finance, Sikkim University was the chief guest. Distinguished ethnobotanist, Prof. G S Yonzon delivered the valedictory address. Dr. Sunita Singh Dhawan, Dr. M K Sathish and some of the participants expressed their views about the outcome of the Conference. Five prizes winners in the poster presentation and young scientist's categories were distributed trophies & cer-

tificates. Dr. N Sathynarayana, Associate Professor, Department of Botany and organizing secretary, presented the conference report and read out the recommendations that were compiled after taking inputs from all the delegates. Dr. S K Rai proposed vote of thanks.

The conference was sponsored by four premier funding agencies of the country such as: National Medicinal Plants Board (NMPB), New Delhi; Dept. of Science & Technology (DST), New Delhi; Dept. of Biotechnology (DBT), New Delhi; Council of Scientific & Industrial Research (CSIR), New Delhi. along with Sikkim University.



Editor's Note

The month that went by saw the faculty busy with conducting meetings of the departmental boards, duly constituted according to the university statutes, where proposals for MPhil and PhD as well as revision on syllabus was taken up. That these were taken up in addition to the teaching activities made October 2013 an eventful month. Experts in the respective fields, drawn from different universities across the country and the faculty discussed the research proposals threadbare and also recommended changes to the syllabus. As for the 11 new departments that were set up in July 2013, the task of formulating the syllabus for the Second and Fourth Semesters of the Masters programme too were taken up by the respective Boards. All these were taken up by the School Boards – for the Science Schools as well as the School of Humanities and Social Sciences – on October 25 and

28, 2013.

It is to be noted that the National Conference on New Frontiers in Medicinal Plants Research, held in the earlier part of October was organized by the Department of Botany in the midst of preparations for the meetings of the Department's Board as well as the School Board. The conference was indeed a major event and a successful one at that.

This issue has also been rendered richer by Amitabha Bhattacharyya, Associate Professor in the Department of Physics with his interesting write-up on $E=mc^2$ A Biography of the World's Most Famous Equation by David Bodanis.

Dr. V. Krishna Ananth



Publications:

Ray, P. P., “Channel Modeling of Human Somatosensory Nanonetwork: Body Discriminative Touch and Proprioception Perspective”, International Journal on Computer Science and Engineering (IJCSE), ISSN: 0975-3397, Vol. 5(10), pp.874-884, 2013.

Ray, P. P., Sharma, A., Rai, R., “MDTRM: Abstraction to Model Driven Tree Reference Model of Internet of Things”, In proceeding of National Conference on Applied Electronics (NCAE), AIT Kolkata, to appear on 26th Oct, 2013.

Rai, R., Lepcha, C., Ray, P. P., Chettri, P., “GDMA: Generalized Domain Model Architecture of Internet of Things”, In proceeding of National Conference on Applied Electronics (NCAE), AIT Kolkata, to appear on 26th Oct, 2013.

Shri Shailesh Shukla, Hindi Officer: Hindi Poem titled `Bantwaara` in Purvottar Bharti Darpan, July 2013, page 21 published by "Nagaland Rashtrabhasha Prachar Samiti"

Dr.V.Krishna Ananth, Associate Professor, Department of History
Fodder Scam, Lalu and the Conviction, Economic and Political Weekly, Vol - XLVIII No. 43, October 26, 2013.
<http://www.epw.in/commentary/fodder-scam-lalu-and-conviction.html>

Dr.V.Krishna Ananth, Associate Professor, Department of History,
After the ordinance storm: Young man needs a lesson in propriety, DNA, October 4, 2013.
<http://www.dnaindia.com/analysis/column-after-the-ordinance-storm-young-man-needs-a-lesson-in-propriety-1897962>

Invited Lectures:

Pradip Kumar Das, Assistant Professor, Department of Management

Invited as speaker in the National Conference on New Frontiers in Medicinal Plants and Research & Special Meeting on Medicinal plants for livelihood Security and Community Empowerment in Eastern Himalayas organised by Department of Botany Sikkim University on The topic of "**Critical challenges in Capacity building & Community Empowerment in Eastern Himalayas**" dated 3-5th October 2013.

Conferences and Seminars:

Pradip Kumar Das, Assistant Professor, Department of Management

Presented a paper on "**The Migration Management**" in the international Confernce on Human Resource Mobility: Implications, challenges and Remedies organised by Dept. of Geography Sikkim Govt. College, Tadong on 17th and 18th October 2013.



Books:

E = MC SQUARED: A BIOGRAPHY OF THE WORLD'S MOST FAMOUS EQUATION

by David Bodanis, Berkley Books, New York, 2000.

Amitabha Bhattacharyya
Associate Professor
Department of Physics

I had reached the airport early, and the flight was late, so I started wandering in the shops and this book was staring at me, almost begging to be bought and read. I obliged, and once I started reading it, could not stop (still haven't stopped!!!). I am finding something new in every read. Credit goes to the elusive author, David Bodanis, about whom nothing is written in the book and very little on the internet. This is not a book on science, neither is it popular science. It is a biography of an equation. The author does not explain the meaning of the equation; he explains the history of the equation, the meaning just sneaks in.

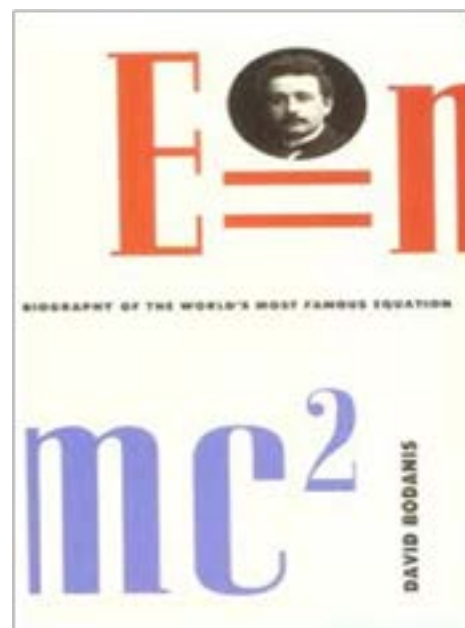
In the preface to the book, the author presents an interesting anecdote, as to why the book was written in the first place. "...I was reading an interview with the actress Cameron Diaz ... At the end the interviewer asked her if there was anything she wanted to know, and she said she'd like to know what $E=mc^2$ really means. They both laughed, then Diaz mumbled that she'd meant it

"You think she did mean it?" one of my friends asked, after I read it aloud. I shrugged, but everyone else in the room—architects, two programmers, and even one historian (my wife!)—was adamant. They knew exactly what she intended: They wouldn't mind understanding what the famous equation meant too. It got me thinking. Everyone knows that $E=mc^2$ is really important, but they usually don't know what it means...."

The book starts with E, the energy and explains how the concept entered into the thinking of scientists with the pioneering work of Michael Faraday. We also get a glimpse of the world of those days and the lives of scientist of the time. The struggle that a poor apprentice of a bookbinder faced is described in graphic details. The fact that energy remains a constant comes out in details.

Then comes the history of m, the mass. This starts with Lavoisier, the chief tax collector of Paris, who performed ultra-accurate experiments, far ahead of his time, to show that the total mass remains constant in any process, provided the measurements are made very accurately. The first experiments were done on the rusting of iron, where the addition of oxygen to iron increases weight, in contradiction to what was then believed. The careful measurements of Lavoisier showed that the weight actually increases, and the increase is precisely equal to the weight of oxygen added. He performed the experiment in reverse to measure the mass of oxygen evolved. This showed that the mass remains conserved, no matter how things may appear to change. The story talks in parallel of Lavoisier's work as a tax collector, which led to widespread unrest during the French revolution. This unrest and subsequent events finally led to his execution.

The importance of c, the speed of light is generally underestimated. c stands for celeritas, the Latin word for swiftness. The importance of this quantity has been described in detail, as it provides the connection between the apparently isolated phenomena of electricity, magnetism and light. The story again touches Faraday, now an old man and his young friend, James Clerk Maxwell, who provided the necessary mathematical background to Faraday's ideas and immortalised all of electromagnetism in four elegant equations which now





carry his name.

The most underestimated part of the equation is the square, but Bodanis deals with it in his characteristic manner. He takes the story to France of the early 1700s, to a young girl whose father had said “My youngest flaunts her mind, and frightens away the suitors. . . . don’t know what to do with her”. Meet Emilie de Breteuil, the youngest daughter of a rich French nobleman. When all other girls used their beauty to find a husband, she was reading Descartes’ Analytical Geometry. This was the time that the ideas of Newton were entering France in a big way, and the Newton Leibniz conflict intrigued Emilie. Newton proposed that the total quantity of motion in a body is given by its mass times its velocity, while Leibniz proposed it was mass times the square of the velocity. The conflict was difficult to resolve, with the British going for Newton and the Germans for Leibniz. It was the neutral and intelligent approach of Emilie that showed the merits of both approaches, and modern physicists study both momentum or mass times velocity and kinetic energy or half mass times square of velocity. This was the first use of square in an equation in physics.

The story now comes to Einstein, then a clerk in the Swiss Patent office, who challenge the two accepted facts of the time, the conservation of mass and energy. He showed that neither mass nor energy are conserved, they are but two facets of the same quantity. Mass can be converted into energy and vice versa, and the fact that the mass gets multiplied by c squared when converted to energy shows that a huge amount of energy can be generated from a very small mass. Einstein’s work was published in 1905 and was accepted with acclaim after a few years.

The story then continues with further developments of this remarkable theory. The Second World War made the making of the atom bomb using this idea a necessity both for Germany and USA, which led to immense research efforts. The immense destructive results are too well known to all for any more comments. The other offshoots of this result are no less remarkable, albeit not so well known. The immense energy released by the sun had fascinated generations of physicists. Cecilia Payne showed that this is due to the combination of four hydrogen atoms to form a helium atom. The helium atom weighs less than the four hydrogen atoms, the extra mass coming out as energy. As usual, the difficulties of a woman in fundamental research in the 1920s and 30s come out in detail.

Here comes an Indian connection. Subrahmanyan Chandrasekhar was on his way to Cambridge in 1930. It was a long and mostly quiet cruise, and he was armed with sheaves of paper and a habit of using his spare time productively. The English racism helped, for the white children were normally not allowed to mix with a dark skinned Indian. At that time it was known that giant stars would explode and their outer portions would go away and the inner core would remain. Chandrasekhar knew that the core is under a lot of pressure, and he had the time to think what happened to it. The gravity in this remnant star becomes very high, due to the fact that the pressure is a kind of energy, which manifests as a mass. This increases the pressure and creates a catch-22 situation where the gravity keeps increasing, wherein the remnant star keeps getting crushed. What does this lead to? This would lead to a situation where nothing would escape outside; everything would be sucked in – the concept of a black hole. The first evidence for this phenomenon came in 1960, when a star appeared to spin around an area which did not show any other star – there was a black hole there.

The book also speaks of Einstein’s other contributions. Finally it ends in a chapter on follow ups on the lives of the players described in the book, one on further technical details for those interested, and finally one on suggestions on further reading.

Let me hazard a guess at the end. If Cameron Diaz has read the book, she has understood what the equation means. Definitely a book to be read by scientists and non-scientists alike, a must read for every curious intelligent person.
