# CURRENT SCIENCE

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## CORRESPONDENCE

## Science must grow with quality and benefit to mankind

Scientists like Newton discovering gravity, Einstein finding out $E = mc^2$, Marconi inventing radio, Edison making electric bulb, Baird producing television and Darwin revealing evolution[1] are not found in the present scientific era, despite increasing scientific organizations, funding agencies, scientists and sophisticated communication technology. What is the reason for it? Does it mean that discovery and inventions of such fundamentals are over or scientists of the capacity of Newton, Einstein and Edison are not produced in the present period or the present environment of science is of constraints or politics (inhibiting each other for selfish gains) that oppress the production of scientists of Newton's, Einstein's and Edison's capacity or, modern scientists lack proper dedication to science and instead, award, reward, credentials, mere publishing, power and position oriented or scientists have kept science only for their livelihood and making profit through projects? However, science is growing profusely, but not with discoveries and inventions as more in number as in earlier years. On the other hand, the threat to survival of human kind is posed by detrimental nuclear weapons—an inventive contribution from science. It must be observed at this juncture that science is funded by mankind (as the tax payer) and science must be completely monitored to benefit mankind's welfare and peaceful survival. Can all these affairs amount to evolving a principle and the method for science to have qualitative and beneficial growth? Is it not the responsibility of all scientific organizations, science policy makers, science peers and administrators (at international and national level) to take up this task immediately? The growth of science in addition to its quality must benefit mankind.


1. *Dictionary of Scientific Biography* (A–Z) (Editor-in-Chief, Charles Coulston Gillispie), Charles Scribner's Sons, New York, USA (C), 1974



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## NEWS

## An experimental 'moss garden' in Nainital

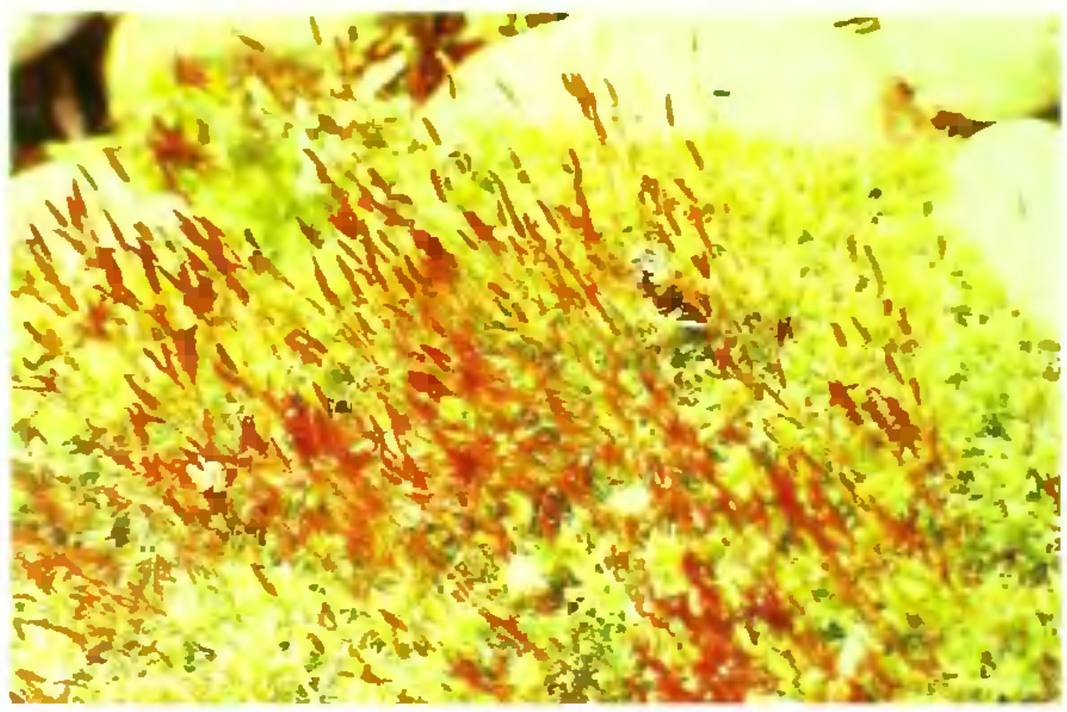
The Department of Science & Technology (DST) has been promoting research and development activities in identified challenging areas. While supporting research in areas like molecular biology, biochemistry, etc., the Programme Advisory Committees in the area of Life Sciences are aware that there is a strong need to support good work in the areas such as plant taxonomy, biodiversity, ecology, etc.

Giribala Pant had an earlier DST project on 'Exploration of the Bryophytic vegetation of districts Almora and Pithoragarh' and had described a large number of Bryophytes, including some rare species.

Bryophytes (mosses, hornworts and liverworts) form an important part of the ecosystem but normally remain unrecognized and underexplored components of nature. They are beautiful green miniatures of the plant kingdom growing in cushions, tufts, mats or pendants and impart a lush greenery to practically all kinds of moisture-retaining substrates As they retain large quantities of moisture and decrease surface run-off, the ground is protected from erosion. Unfortunately this green layer continues to disappear from the Himalayan vegetational mosaic because of mounting pressures of man-induced environmental changes including urbanization, habitat destruction, deforestation and pollution.

When Giribala Pant submitted her second project to DST, the Programme Advisory Committee on Plant Sciences desired that she should develop a Bryophyte Garden in which rare and endangered species of this division of plants can be cultivated and multiplied for research and educational purposes. In view of her studies in Kumaon Himalayas and her expertise in the field, it was thought that she was well placed to develop such a garden which would be a unique one for India An ancient Bryophyte garden which is internationally acclaimed is Kyoto's Sanbogi Garden

Profusely fruiting population of a moss. *Timmiella anomala* Hedw, in the garden.



Himalayan monotypic endemic *Stephensoniella brevipedunculata* Kash.

(Moss Temple) in Japan.

An experimental 'moss garden' came into existence two and a half years ago in the Department of Botany, DSB College, Kumaon University, Nainital. As the term 'moss' is simpler to comprehend than bryophyte for the public, it was preferred in the title.

Species suited to the environmental conditions of the four plots in the garden were transplanted to artificially created beds of various shapes, sizes and patterns keeping in view the slope, shade and direction of each plot. In all, 65 species of mosses and 28 species of liverworts have been propagated in 115 low-cost conservation beds.

Among transplanted elements, xeric species have been most successful in establishing themselves in the garden. Some of the characteristic bryospecies of mineral-enriched substrates have also been transplanted with success. Ten rare or threatened liverworts, including two monotypic endemics such as *Aitchisoniella himalayensis* Kash. and *Stephensoniella brevipedunculate* Kash. are flourishing well.

During the rainy season, the transplanted bryocover touches its lush expansion and remains so up to the end of October/November remaining relatively dormant during the rest of the year.

This multipurpose experimental 'moss garden' developed on a pilot scale is the first attempt of its kind in India which not only aims to conserve the bryodiversity of the region but also serves as a bank of living bryophytes which can be supplied in small amounts for purposes of education, research and exhibition. Importantly, this is a modest attempt to take up practical action in conservation.

An illustrated folder showing the layout of the garden has been published and may be obtained from the Department of Science & Technology, New Delhi. Material for teaching or research may be obtained from the Department of Botany, DSB College, Kumaon University, Nainital. Living specimens for preservation at the garden are also welcome.

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# A report on the workshop on end-stage transition

Nearly 40 invited participants gathered on the evening of 15 August 1993 in the Minnowbrook Conference Center on the shores of Blue Mountain Lake in the Adirondocks to discuss for the following two and a half days the late stages of transition in boundary layers. The Conference Center, run by Syracuse University, provided the ideal ambience for an informal and stimulating workshop on a subject that is at once scientifically challenging and technologically important. The workshop was unique in that it brought together, for the first time, those working on improving our understanding of transition phenomena with others concerned with handling and modelling transitional boundary layers in applications, especially in turbomachinery. Or, as Paul Gostelow (Sydney, who organized the meeting so effectively with John Lagraffe of Syracuse and Terry Jones of Oxford) put it, the intention was to bring the JFM and ASME types together (he mentioned high and low church as well!).

The point was pursued by Roddam Narasimha (Bangalore) in his opening talk (his theme was The Many Worlds of Transition Research). Transition is a complex subject, and its investigation is being pursued in many sub-communities, respectively concerned with stability, receptivity, breakdown, turbulent spots, modelling, direct numerical simulation (DNS), etc. It is remarkable that there is not a single experimental investigation of transition from laminar to turbulent flow in a boundary layer that goes the whole way—on any one of the many routes that everybody admits are possible.

The workshop was dominated by discussions on turbulent spots—their genesis, properties and consequences—although Tom Corke (Illinois) described how transition could occur *without* spots. This spot-less or 'scenic' route (as Narasimha called it—the road here is slow and long), discovered by the Novosibirsk group, was followed when a resonant interaction between a TS wave and a pair of oblique waves is arranged (this is done, in Corke's