delivered. Back then, the understanding of nano phenomenon was highlighted in the form of what was referred to as the neglected dimension: the colloidal state. Wilhelm Ostwald, a chemist and Nobel laureate, credited with numerous discoveries in catalysis and synthetic chemistry, was the one responsible for claiming the existence of this neglected dimension. As is well known today, the colloidal state is one that lies somewhere between single molecules and bulk matter, with particles of size ranging from 1 nm to 1 μm dispersed in solution. Ostwald envisioned that such materials display unusual mechanical, electrical and optical properties. He had also proposed many interesting applications of these colloidal systems, ranging from responsive materials, flocculants and dispersants, to better pigments and drug delivery systems, much like the ones proclaimed by nano-scientists in today's world with the use of sophisticated technologies.

It can be claimed that nanoscience is just an over-hyped extension of colloidal chemistry. The current hype has helped in the development of the field which remained unexplored for years. In other words, it has helped in re-inventing nanoscale chemistry, something that colloidal chemistry could not do all these years. With the awareness of the unlimited possibilities resulting from the introduction of nanoscience and nanotechnology to conventional science streams, the expectations of the scientific community and general public have soared sky-high. Maybe it is time we start believing that nanotechnology is really the next big thing.

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Patent office and patent applications – Bridging the disparity

The Indian Government is proactively taking steps to increase awareness about protection of intellectual property in all fields of technology. The efforts of the Government are paying rich dividends as a lot of interest and awareness has increased among researchers regarding intellectual property. A number of researchers are protecting their intellectual efforts through patents. This was not the case a decade ago. The reason for this awareness and importance is due to India's accession to GATT and eventually to WTO. Annual reports published by the Patent Office of India show the patent applications filed, number of applications reviewed and the number of patent applications granted. Though there is a good sign of improvement in the number of applications filed, the number of patents granted is dismal. Perhaps, more patent examiners can help expedite review of patent applications and grant of patents. The number of applications filed in the last four years was 10,592, 11,466, 12,613 and 17,466 for the years 2001–02, 2002–03, 2003–04 and 2004–05 respectively. The patents examined were 5104, 9538, 10,709, 14,813 and those granted in the corresponding period were 1591, 1379, 2469, 1911 respectively. This clearly shows the disparity in the number of applications filed and number of patents granted. The reason for this is that patent offices in India are not connected digitally, data on patents filed across the globe are not easily accessible and data of one branch office cannot be shared with other offices. This is particularly required to ascertain and share details of prior art and to review the applications accordingly. Traditional knowledge used in India over the years has been exploited by foreigners and the Indian Government had to spend a huge sum of money to revoke patents based on traditional knowledge. A database of traditional knowledge in the form of a Traditional Knowledge Digital Library with help from CSIR, New Delhi is a welcome step in this direction.

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Planetary explosions

There should be a deliberate effort from the earth scientists to seek and solve many pending problems in earth physics. More than twenty-five years ago, I raised the matter of existence of an innermost core in the earth at the centre, where immediately on the formation of the liquid earth, heavy elements like U, Th, Tb, Ta, Lu, Ho, Hf, Ir and Dy sedimented[1]. It may be asserted that the gravitational separation of critical layer of fissionable uranium, ^{235}U, leads to a violent atomic explosion assisted by the presence of large quantity of fissile material in the innermost core[2]. Similar atomic explosions must have also occurred in other planets, perhaps leading to the disruption of a small earth-like planet between the orbits of Mars and Jupiter. Such explosions would be the natural cause for the appearance of planetary satellites and also would have provided a scab from the earth's iron core expelled beyond the earth's Roche limit for the formation of the moon around it. I have not been able to publish the complete theory, but I circulated a private booklet entitled *Earth's Innermost Core* and delivered lectures both in India and abroad on this theory. Now the international community has

come around to accept the possibility that the earth was a liquid mass on formation and the rest can be accepted in time.

I am approaching the earth scientists to ponder on important issues, namely:

(a) Why should the dynamo theory[3] not be totally given up for earth's magnetism, when the actual field of the earth is inclined to the axis of rotation and similar deviation exists for the other planets that have a magnetic field. The magnetic field can be explained by the expected paramagnetism of the bulk of the iron core and some ferromagnetism of its projections into the cooler outer core, and the inducing field is reversible, provided by the minority helium atoms in the innermost core.

(b) Where is the helium coming from when after a long residence time in the earth's atmosphere, it seems to be easing out into space at the rate of about 1 atom/sq. cm of the outer surface of the earth's atmosphere. The source of the helium is the ternary fission during the giant-sized atomic explosions in the innermost core.

(c) What is the explanation of planetary tilts when one might expect the rotating planets to be upright when revolving in their orbits. These tilts, and occurrence of the planetary satellites point to the atomic explosions inside the planets.

To me the discovery of an iron slab below the equatorial plane of the moon will be no surprise.

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Pyramidal hierarchy in the scientific community

None are more hopelessly enslaved than those who falsely believe they are free.
– Goethe

I read with interest a letter by Sharma[1] attempting to formulate a recipe for a made-in-India Nobel Prize. The issue of Nobel drought in India has been an enduring theme in the correspondence pages of *Current Science* for some years. While Sharma has indeed highlighted many determinants in this context, an often unnoticed phenomenon, and perhaps the most overpowering concern has not been mentioned with the requisite emphasis.

The greatest impediment to progress pertains to the pyramidal hierarchy that governs science in India. This important attribute that stifles Indian science has rarely been addressed by those in the seat of power. Worse, the superiors take hierarchy for granted, while it is not even noticed by the subordinates!

A national newspaper carried an interesting news item about the Nobel Laureate, Peter Doherty's recent visit to India. Quoted below are a few lines of particular relevance to the Indian scientist community.

> In an effort to bridge the senior–junior gap in the research institutes, Nobel Laureate Peter C. Doherty on Sunday called India to shun the 'pyramid culture' to bring out the best in the budding scientists.... Talking to the reporters, he said by 'pyramid culture' he meant the hierarchy in the scientific community. In the absence of such discrimination, students are in a better position to question their seniors with relevant data, he said.
>
> *The Times of India*
> [Mangalore] 19 March 2007

What could have prompted Doherty to come to this conclusion? Surely, India has not been Doherty's major subject of research. And yet he hit the nail on the head! How? Considering that his statement was prompted from nothing more than a casual interaction with India, it must certainly have been the most glaring fault that attracts a visitor's attention.

It is this ill-conceived reverence for the big man that seems most incongruous in the scientific community. When we cannot ask questions about the day-to-day concerns of our lives, how can we be trusted to ask subtler and more profound questions that govern nature?

Even a casual glance at the statistical data on world science will show that democracies, though not necessarily all 'democratic' governments, perform best in science. Democracy is more than just elections that sweep the nation off its feet every now and then.

Almost all path-breaking science has originated in the Western democracies. The most robust contributor is USA, the first nation to embrace democracy in its most modern form. Notwithstanding the early years of slave trade, the US community has indeed shown that science can flower most admirably in an atmosphere of equal opportunity and affirmative action. Proof of the pudding lies in the eating!

The hierarchy in Indian science is only a corollary to the natural barriers that divide society. And consequently, such impediments are also the most difficult to eradicate. Even from a tender age, students in India are taught to obey and follow rather than either lead or challenge a notion cherished by a senior. This is the foremost hazard that plagues the rational intellect of an Indian. The 'boss is always right' syndrome has ruined the thinking mind.

Scientists in India opt to metamorphose into science administrators because of the feudal hierarchy that rules us. The seat of power is a great temptation because little else gains visibility in the socio-political definition of a successful Indian scientist.

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