

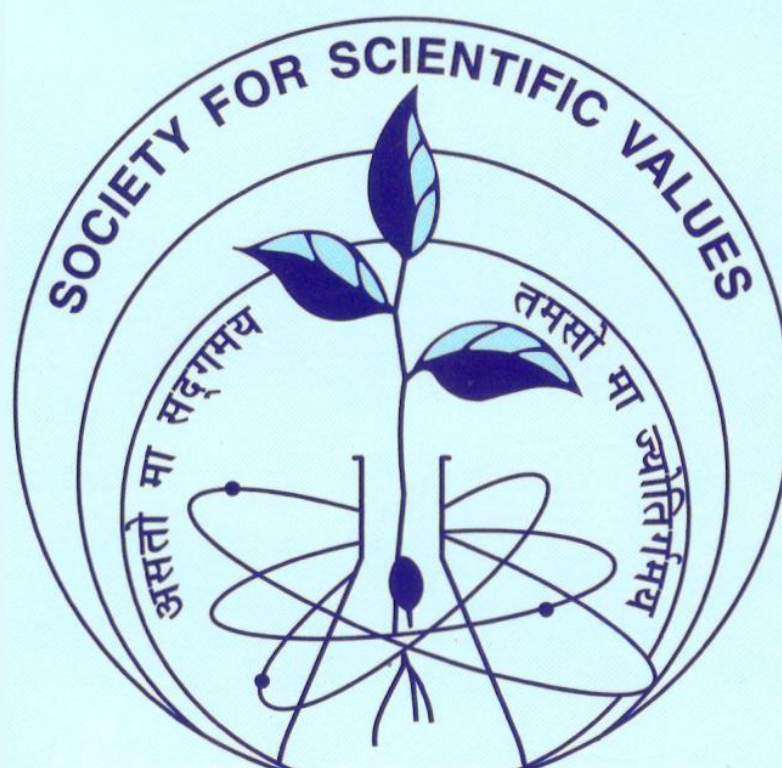
# *Society for Scientific Values*

**Ethics in Scientific Research  
Development and Management**  
*News And Views*

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No. 1



*Let Truth Prevail*

Regd. Office: DST Centre for Visceral Mechanisms  
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### **Main objectives of the 'Society for Scientific Values'**

1. To promote objectivity, integrity and ethical values in pursuit of scientific research, education and management, and
2. To discourage the unethical acts in these areas

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## Editorial

Science has always been considered the epitome of pure knowledge and practitioners of science the seekers of truth without any compromise for anything but truth. That is how mankind has built the knowledge bank on which understanding of the universe, its constituents and the present day technology stands. Scientific dishonesty, unethical practices, plagiarism all tarnishes the image of the practitioners of a noble profession – science. The virus of scientific dishonesty has spread across the globe and in all age groups – students as well as faculty members of academic institutions. Copying text, figures, tables from other published material without giving due credit are rampant. There are instances when credits of junior researchers are curbed by senior faculty at their whims and fancy. Why do some people indulge in such practices? As we all know, truth always prevails and sooner or later the dishonest act comes into light and the carefully built reputation of the person gets tarnished forever. Immediate gain is marred by lifelong damage and disrespect from the peers. Such incidences not only defame the individual but put a question mark on the integrity of practitioners of science in general and from a country in particular. Indian science is also under lens due to such incidences.

We all have the moral responsibility to uphold the scientific values and increase the respect of our great country in unquestionable scientific publishing. We hail from the land of Kanad, Aryabhat, Nagarjuna, Sushruta, Charaka and many other sage scientists who discovered mysteries of science and medicine much before the western civilization came into being. Even if we cannot become the path breakers in all scientific fields, we can strive to become a country of honest researchers whose motto should be "***Satyam Vada, Dharmam Chara***" which means speak the truth and lead a virtuous life.

Santa Chawla

## Honours and Awards to SSV Members

Prof. Vikram Kumar has been awarded the Distinguished materials scientist of the year 2012 by the Materials Research Society of India (MRSI).  
He was also recognized by the Indian Semiconductor Association (ISA) as the Technomentor 2011

Prof. Sisir Sen has been awarded the Wadia Medal of INSA

## SSV activity highlights in the current period

The Paintal memorial lecture, 2010, of SSV was delivered on 12<sup>th</sup> March, 2011 by Dr. V.M.Katoch, DG, ICMR at Vigyan Bhavan, New Delhi

Since the inception, Paintal memorial lecture has been organized annually by SSV and delivered by the following eminent scientists:

- Prof. M. G. K. Menon, former President INSA
- Dr. R. A. Mashelkar, Former DG, CSIR
- Prof. Deepak Pental, VC, Delhi University.
- Prof. V. K. Gaur, Indian Institute of Astrophysics, Bangalore
- Dr. T. Ramasami, Secretary, DST

**Annual General Body Meeting of SSV was held on 9<sup>th</sup> January** at NPL auditorium, New Delhi. Election for the new Office bearers and executive council members of SSV was held in the general body meeting on January 9, 2012.

### **Minutes of the 19<sup>th</sup> Annual General Body Meeting (AGM) of the Society for Scientific Values**

In its meeting held on Dec. 2, 2011, the EC decided to call a GB on Jan 9, 2012 for electing new EC members for the period 2012-15. The Election process attempted through E-mail was very disappointing in response. Therefore it was decided to hold election in a GBM on Jan 9, 2012 at 3:00 pm. Due to lack of quorum in the GBM, the meeting was adjourned and reconvened later on. Fifteen members attended the meeting:

The GBM elected the following office bearers of the Society:

**President**  
Prof. K. L. Chopra

**Vice President**  
Prof. P.B.Sharma  
Prof. P.S.Dutta

**Secretary**  
Dr. R. K. Kotnala

**Joint Secretary**

Dr. Anand Akhila

**Members**

Dr. Vikram Kumar

Prof. Sisir Sen

**Treasurer**

Dr. Indramani Mishra

**Members**

Prof. N. R. Jagannathan

Dr. S. N. Singh

**Immediate past President**

Prof. P. M. Bhargava

**Members**

Prof. Uttam Pati

Dr. Harikishan

**Special Invitees**

Dr. Santa Chawla

Prof. P. N. Srivastava,

Prof. Bimla Buti

Dr. P. N. Tiwari

Dr. Ashok Kumar

**Editor Publications**

Dr. Santa Chawla

**Ex Officio Members**

Previous President Ex-Secretary  
Dr. P. M. Bhargava Dr. N. Raghuram

**Associate Editor**

Dr. K. Satyanarayana

## New SSV Members

The following nominations for SSV membership were approved by the EC:

1. Dr. Dinesh Abrol,  
NISTADS; New Delhi-1110012  
[dkabrol@nistads.res.in](mailto:dkabrol@nistads.res.in)
2. Dr. B. K. Das,  
[bkdas45@yahoo.co.uk](mailto:bkdas45@yahoo.co.uk)
3. Dr. P. R. Naren  
School of Chemical and Biotechnology, SASTRA University.  
[pnaren@scbt.sastra.edu](mailto:pnaren@scbt.sastra.edu)

## Some cases of misconduct

- An international journal has retracted three published papers of a professor of IIT Kanpur. The Director, IIT Kanpur has been requested to inquire into the matter and take appropriate disciplinary action.
- Two serious cases of plagiarism by the faculty and research students of Kalasalingam University have been investigated and verified. The VC of the University was informed and asked to take an appropriate action. It is very gratifying to note that the VC has taken the case very seriously and has dismissed the faculty and students engaged in plagiarism.
- Sant Longawal University (SLU) has sought advice from SSV regarding the case of a faculty member who has received PhD from a private university on the basis of a plagiarized thesis. Involved in this complicated case are three universities and two supervisors. The President, SSV has sent a detailed response and suggestions for punitive action to the VC of SLU.

- A recent case of reproduction of text in a paper on the subject of infrared photo detectors published in high impact factor journal *Advanced Materials* has been matter of much concern in Indian scientific community. As Indian Express reports on March 5, 2012 "...the editors of that publication were alerted by a team of Indian and Chinese scientists to their earlier work in Applied Physics Letters, from which several introductory sentences had been lifted verbatim...". The authors have sent an apology to the journal. The copy of the letter was sent by the publisher of the journal to the President, SSV and is reproduced below. After this apology became public, four more similar cases of plagiarism in the research papers by the same authors have now been reported in the media.

**APOLOGY**

Infrared Photodetectors Based on Reduced Graphene Oxide and Graphene Nanoribbons  
Basant Chitara, L. S. Panchakarla, S. B. Krupanidhi,\* and C. N. R. Rao\*  
*Adv. Mater.* 2011, 23, 5419–5424  
DOI: 10.1002/adma.201101414

The corresponding authors regret the reproduction of text from an article that appeared in *Applied Physics Letters* (S. Ghosh, B. K. Sarker, A. Chunder, Lei Zhai, S. I. Khondaker, *Appl. Phys. Lett.* 2010, 96, 163109 ) in their paper.

The corresponding authors sincerely apologize to the readers, reviewers, and editors for this oversight and for any miscommunication.

### New cases under consideration with SSV

- Dr. Ana M. Diaz-Arnold, Professor, University of Iowa College of Dentistry has complained to the president, SSV that the authors, N. Murdia and S. Dixit, from Pandit Deendayal Upadhyaya Dental College, Kegaon, Solapur have plagiarized their entire paper in the article "**Luting Agents: A Critical Analytic Appraisal**" *JIDA* 2010 4(11):404-407; from their previous publication: **Diaz-Arnold AM, Vargas MA, Haselton DR, "Current status of luting agents for fixed prosthodontics", *J Prosthet. Dent.* 1999;81:135-41.** Prof. Diaz-Arnold has asked for immediate retraction of the JIDA article clearly stating the reason and giving due credit to their research team.
- Steven L. Shafer, Editor-in-Chief, *Anesthesia & Analgesia*, Professor of Anesthesiology Columbia University, Adjunct Professor of Anesthesia, Stanford University, Adjunct Professor of Bioengineering and Therapeutic Sciences, UCSF, has written to President, SSV about repeated instances of misconduct from MP Shah Medical College. He allegedly complained to Indian Council of Medical Research but did not receive any reply. He has pointed out the research fraud in the Medical Biochemistry Department at the University of Madras where members have 'published multiple fraudulent manuscripts' and 'not a single study has been retracted'. Despite repeated reminders, MP Shah College took no action against the faculty colleagues who have been accused of repeated cases of

plagiarism. After warning the institution of the consequences by the President, SSV, a mild action of forbidding the accused faculty to publish any research papers during the next 5 years has been taken by the institution. This is a rather mild punitive action and SSV president has conveyed his unhappiness to the administration of the College.

## News pertinent to SSV's cause

### Global

- A Chinese university – Zhejiang University (ZJU), Hangzhou, has seriously cracked down on scientific misconduct [Nature, V 481, 12 Jan. 2012, pp.134-136]. Three faculty members were terminated from their employment, 'four faced disciplinary action including a pay cut, and the rest were issued with public or internal warning. Some have been temporarily forbidden from taking Ph.D students'. The president, Yang Wei, intends to make ZJU a role model and clean up the reputation of their country which was perturbed due to some high profile cases [Nature, V.441, 2006,pp.392-393].
- Indiana University, Bloomington has exemplified instruction to educate researchers in how to avoid plagiarism in the following link: <https://www.indiana.edu/~istd/overview.html>  
This link contains overview of Identification of plagiarism, case studies, recommended action plan and further resources for study.
- Duplication in research fund granting has become a serious concern (Nature, V.482, 9 Feb., 2012, p.146) in US. It has come to light that Craig Grimes, who was a professor of electrical engineering till 2010 in Pennsylvania state university, accepted research grants from Department of Energy (DOE) and National Science Foundation (NSF) for Solar conversion of Carbon dioxide into hydrocarbons. When DOE Inspector general caught the duplication, Grimes pleaded guilty and resigned from his university position. An ex inspector general of NSF, Mr. C. Boesz said "It is not a problem to apply for funds for the same research at different funding agencies, but it is illegal to accept and use the funding". Both DOE and NSF take precautions to check such duplication. In some cases when peer reviewers can detect similarity in the grant proposals and brings to the knowledge of the funding agency, it may be checked. Harold garner for Virginia Tech in Blacksburgh has developed software to check similarity of the project proposals so that funding agencies may benefit.
- Plagiarism has been defined by the American Association of University Professors (September/October 1989) as "taking over the ideas, methods, or written words of another, without acknowledgement and with the intention that they be taken as the work of the deceiver". Dr. Miguel Roig



has written guidelines to create awareness from the Office of Research Integrity (ORI) for educating scientists in the Responsible Conduct of Research (RCR) on “Avoiding plagiarism, and other questionable writing practices: A guide to ethical writing”.

- Self plagiarism has also become a matter of concern because many researchers recycle their published work to show enhanced productivity (Nature, V.468, 9 Dec. 2010, p745). Nick Steneck, director of research ethics and integrity at the University of Michigan opined of the need of “a uniform misconduct policy that provides clear guidance not only on data falsification and fabrication but also on lesser ethical breaches-such as self-plagiarism”.
- US office of research integrity (ORI) has detected and taken action on many cases of plagiarism (Nature News, 11 January, 2012, <http://www.nature.com/news/us-authorities-crack-down-on-plagiarism-1.9776>). The cases also include Indian origin researchers working in US universities like Mahesh Visvanathan, Kansas University and Jayant Jagannathan of the university of Virginia in Charlottesville. In detecting such cases, iThenticate software has been proved very helpful and 50 universities and 600 publishers including Wiley, Elsevier and Nature publishing group subscribe.
- British Medical Journal and the international Committee on Publication Ethics organized a meeting in January, 2012 in London [Nature, 481, 237–238 (19 January 2012) doi:10.1038/481237b] to discuss the problem of research misconduct. In the US, the Office for Research Integrity (ORI) investigates misconduct and takes action. In the United Kingdom, the existing independent advisory group, the UK Research Integrity Office in Falmer, mostly do not take on such a role. “British funding councils — in collaboration with the country's universities — have chosen instead to produce a 'concordat' detailing good practice, to which institutions will be expected to sign up. “This is laudable, but unlikely to strike fear into fraudsters and fabricators.” A survey by British Medical Journal (BMJ) indicated that 13 per cent of respondents from nearly 2,800 doctors and medical academics claimed to have first-hand knowledge of someone “inappropriately adjusting, excluding, altering or fabricating data.” With the exception of plagiarism, Journals can check plagiarism but detecting all forms of scientific cheating is difficult. ‘As a recent Editorial in *Nature* points out, libel laws indirectly prevent journals from even flagging “proven cases of misconduct”.’

## News from UNESCO

UNESCO Chair in Bioethics has **declared UNESCO International Conference on Bioethics Education: Contents, Methods, Trends** at Tiberias, Israel (2-5 September 2012).

“The Conference is designed to offer a PLATFORM for the exchange of information and knowledge and to hold discussions, lectures, workshops and an exhibition of program and databases.

**Target Groups:** Teachers and Educators in Medical Schools, Nursing Schools, Law Schools, Schools of Social Work, Faculties of Philosophy and Ethics, Professional Organizations, Governmental & Public Bodies.

**The Main Conference Topics:**

**Bioethics Education:** General, Objectives, Teaching Methodology, Levels of Teaching, Status of the Programs, Evaluation of Students, Study Resources, References & Material.

The Conference is organized by the UNESCO Chair in Bioethics (Haifa), The Zefat Academic College, The International Center for Health, Law and Ethics, and is supported by the Israel National Commission for UNESCO. The Conference is sponsored by the World Medical Association (WMA).

Abstracts of approximately 250 words are invited for oral and poster presentations.”

**The deadline for abstract submission: May 15, 2012**

**For additional information:** [www.isas.co.il/bioethics2012](http://www.isas.co.il/bioethics2012)

**For registration please contact:** [seminars@isas.co.il](mailto:seminars@isas.co.il)

**Or tel. +972-2-6520574, Fax +972-2-6520558**

website at: [www.unesco.org/shs/ethics/geobs](http://www.unesco.org/shs/ethics/geobs)

**The eighteenth session of the International Bioethics committee of UNESCO (IBC)** was held in Baku, Azerbaijan from 30<sup>th</sup> May to 2<sup>nd</sup> June, 2011

Three main topics under discussion:

- ‘ -the principle of respect for human vulnerability and personal integrity, as set forth in article 8 of the UNESCO Universal Declaration on Bioethics and Human Rights(2005);
- the issue of human cloning and international governance;
- the issue of traditional medicine and its ethical implications.’

In the meeting ‘IBC will strive to finalize its work on article 8 of the Declaration and on the issue of human cloning, and will continue its reflection on traditional medicine. IBC will also finalize its **work programme for 2012-2013** and elect its new Bureau. Moreover, an entire day will be devoted to **Bioethics in Eastern Europe : Experiences, perspectives and new ethical challenges**.’

**“Just Published: UNESCO Bioethics Core Curriculum Casebook Series**

The Division of Ethics of Science and Technology is pleased to announce the following two recent publications in English produced as supplements to the UNESCO Bioethics Core Curriculum:

- Casebook on Human Dignity and Human Rights, and
- Casebook on Benefit and Harm.

The Core Curriculum, which was developed by a group of ethics teaching experts from diverse cultural backgrounds, is a key component of UNESCO's strategy to promote high standards of bioethics education around the world. Based on the *Universal Declaration on Bioethics and Human Rights* (2005), it is designed to introduce the bioethical principles of the *Declaration* to university students. It does not impose a particular model or specific view of bioethics, but articulates ethical principles that are shared by scientific experts, policymakers and health professionals from various countries with different cultural, historical and religious backgrounds. In order to ensure a flexible application of this tool, the Curriculum invites teachers and students to expand its contents and approaches based on the local context.

The new casebooks are part of the *UNESCO Bioethics Core Curriculum Casebook Series*, designed to be used with the Core Curriculum, or as stand-alone study material for one of the bioethical principles in the Declaration. In order to encourage wide dissemination and usage of this series, the casebooks are freely available in hardcopy, in CD-ROM as well as for electronic download. These casebooks will also be translated into French soon.

If you would like to receive hardcopies and/or CD-ROMs of the casebooks, please send an email to [geobs@unesco.org](mailto:geobs@unesco.org) with your mailing address and the number of copies of each item (subject to the availability of stock).

Electronic copies of the casebooks and the core curriculum are available for download as follows:

**Casebook on Human Dignity and Human Rights (in English only):**

<http://unesdoc.unesco.org/images/0019/001923/192371e.pdf>

**Casebook on Benefit and Harm (in English only):**

<http://unesdoc.unesco.org/images/0019/001923/192370e.pdf>

**UNESCO Bioethics Core Curriculum Section 1 (Syllabus):**

Arabic: <http://unesdoc.unesco.org/images/0016/001636/163613a.pdf>

English: <http://unesdoc.unesco.org/images/0016/001636/163613e.pdf>

French: <http://unesdoc.unesco.org/images/0016/001636/163613f.pdf>

Russian: <http://unesdoc.unesco.org/images/0016/001636/163613r.pdf>

Spanish: <http://unesdoc.unesco.org/images/0016/001636/163613s.pdf>

**UNESCO Bioethics Core Curriculum Section 2 (Study Materials):**

A new version of Section 2 will be launched in a separate announcement in the coming weeks.

Further study materials related to the Bioethics Core Curriculum and to ethics teaching in general could also be accessed from the **Global Ethics Observatory (GEObs) Database on Resources in Ethics** (<http://www.unesco.org/shs/ethics/geobs>).

## National

### Indian scientists call for scientific misconduct body

'Indian scientists are calling for an office of research integrity that could detect, investigate and punish proven scientific misconduct in the country' [Papri Sri Raman and T. V. Padma, 20 July 2011 | EN]. It is reported that the rate of retraction of research publications from India is higher than the world average.

It is proposed that 'the office would be part of a national policy on [academic ethics](#).' The meeting was organized by the Institute of Mathematical Sciences and the Forum for Global Knowledge Sharing, an inter-disciplinary global forum for scientists.

"The calls follow a series of plagiarism charges hitting Indian scientists. The most recent followed last year's report by the Indian science academies which [concluded that genetically modified eggplant, Bt brinjal, was safe for consumption](#). The report was found to contain unreferenced text from a pro-biotechnology publication of India's Department of Biotechnology.

Another example was a [retraction of research papers submitted by the prestigious Indian Institute of Technology](#) to *Biotechnology Advances* in 2010.

At the meeting, T. A. Abinandanan, professor of materials engineering at the Indian Institute of Science (IISc), Bangalore, presented data showing a steep increase in the number of international journals in biomedical sciences retracting studies by Indian authors between 2001 and 2010. Of 103,000 published papers 70 were retracted, including 45 cases of misconduct such as fabrication of data, or plagiarism, including re-use of an author's own, earlier work. The average retraction rate was 68 per 100,000 papers.

For comparison, he cited American research into biomedical science papers published through PubMed, showing that retraction rates were 17 globally; 48 in China; 16 in Japan; 14 in United States; and 13 in United Kingdom.

Abinandanan said that most of the cases of misconduct in India are due to plagiarism, the retracted papers are often first published in lower profile journals where authors tried to "fly under the radar".

He said that plagiarism cases may decline in the coming years, due to increasing use of plagiarism-detecting software.

Padmanabhan Balaram, director of IISc and editor of *Current Science*, published by the Indian Academy of Sciences, said that fabrication and falsification of data in India is "rare and more sophisticated".

Participants also criticized the lack of institutional transparency and scientific institutes' unwillingness to investigate scientific misconduct, make their findings public, and take action.

Sunil Mukhi, theoretical physicist at the Tata Institute of Fundamental Research, said: "Ethics depend on the quality of leadership of science institutions. Acceptance of misconduct like plagiarism is very high, with institutions considering the perpetrator as part of family."

## Checking plagiarism

- UGC intends to curb plagiarism by using anti-plagiarism software INFLIBNET (information and library network).
- The Vice chancellor of Sri Krishnadevaraya University has expressed his commitment to curb plagiarism in Ph.D thesis as many students copy earlier Ph.D thesis (source DC, Hyderabad, 6.04.2011)
- **Kalasalingam University**

The action taken by Dr. S. Radhakrishnan, the Vice-Chancellor of Kalasalingam University, Tamil Nadu, India against plagiarism, is highly applauded by SSV. The notification by the VC is reproduced below:

**KALASALINGAM UNIVERSITY**  
(KALASALINGAM ACADEMY OF RESEARCH AND EDUCATION)  
Anand Nagar, Krishnankoll- 626 126  
Virudhunagar District, TAMIL NADU, INDIA

Based on the letters/e-mails received from the Editors of Journals 1) Vascular Pharmacology 2) Life Sciences and 3) Experimental Eye Research regarding Scientific misconduct (Image manipulation and the potential of scientific fraud) and Retraction note issued by the Journal "Angiogenesis" our Kalasalingam University constituted an enquiry committee to thoroughly investigate the whole issue. Based on the inputs received and also from the finding of enquiry committee, the following actions are taken by the Kalasalingam University on 5<sup>th</sup> August 2011 and 6<sup>th</sup> August 2011.

1. Dr.G.Sangliyandi, Senior Professor and Head, Department of Biotechnology, and Dean, International Relations, Kalasalingam University was directed to resign from the Kalasalingam University immediately and hand over the charges to Dr.K.Sundar, Professor, Department of Biotechnology. *(Dr.G.Sangliyandi has resigned on 5<sup>th</sup> August 2011)*
2. The Ph.D. Registration of the following Research Scholars is cancelled *(They are the first author of papers in which scientific misconduct was found.)*
  - a. Ms.E.Banumathi (Full Time) Reg. No: 200701101
  - b. Mr.S.Sheik Pran Babu (Full Time) Reg. No: 200701102
  - c. Mr.R.Haribalaganesh (Full Time) Reg. No: 200801106
  - d. Mr.K.Kalishwarlal (Full Time) Reg. No: 200901120
3. The confirmation of the Ph.D. registration of the following Research Scholars is cancelled. *(They are the co-authors of papers in which scientific misconduct was found.)*
  - a. Mr.V.Deepak (Full Time) Reg. No: 200901119
  - b. Mr.S.Ramkumar Pandian (Full Time) Reg. No: 200901121

We thank the editors of the journals 1) Vascular Pharmacology 2) Life Sciences and 3) Experimental Eye Research for informing us about the Scientific misconduct (Image manipulation and the potential of scientific fraud). Our university assure that it will take all necessary steps to uphold the scientific values and maintain the quality in our research activities.

(Dr.S.Radhakrishnan)  
Vice-Chancellor

## Seminar

- A half day seminar on 'Science, Ethics and Spirituality' was held under the 6<sup>th</sup> All India Conference on 'Science and Spiritual Quest 2011' at Delhi Technological University during March 12-14, 2011. SSV members delivered talks on subjects covering all aspects of Ethics in front of a gathering of students and conference delegates. The following talks were delivered: 'Basics and General Principles of Ethics in Science' by Dr.P.N.Tiwari, 'Ethics in Research and Regulations' by Dr.N. Raghuram and 'Misconduct in Scientific Research and Publications' by Dr.Indramani Mishra. The articles are available in News & Views 9(1) March 2011.
- Dr. Rakesh Kr Singh, Dept. of Physics, Patna Women's College, Patna University delivered two lectures on SSV and its objectives on the occasion of National Science day in rural Bihar, at S.talla, Dist- Jamuiai-300 km away from Patna, in January, 2012.
- IIMSC, Chennai organized a seminar related to ethics and Dr. N. Raghuram, the former Secretary, SSV, delivered a talk.
- Vivekananda Institute of Technology, Jaipur organized "National workshop on Science and Society (NSS-2012) on April 14, 2012 in collaboration with SSV. Prof. K.L.Chopra, President SSV was the Chief Guest and delivered a Special Lecture on Ethical Issues in Science & Technology. Dr. R.K.Kotnala, Secretary SSV delivered the keynote address on Nanoscience Ethics. Prof Uttam Pati, EC member SSV, delivered a lecture on Bioethics. About five hundred students along with faculty and several outside experts attended the workshop.
- Prof. K.L.Chopra delivered lectures on ethical issues in Science & Technology at Rajdhani College, Delhi University (Prof S Rao Memorial lecture); at Pondicherry Central University (in one day seminar on the subject); Wadia Inst of Himalyan Geology, Dehradun (Foundation Day lecture); IMT University, Gurgaon; IIT Madras (Special lecture); Bengal Engineering and Science University, Kolkata (Special lecture)

## An Appeal

- SSV is what members will make it. Please participate actively in arranging activities on ethical issues in S&T
- SSV is a voluntary Society. Any financial donation to SSV is entitled for tax deduction under section 80G by the IT department. We appeal to SSV members and fellow supporters for generous donations to strengthen our corpus fund to attain financial autonomy.

**Paintal Memorial Lecture, 2010**

**Innovations to Translation: Journey from dreams into reality**

**V.M.Katoch**

Department of Health Research, Ministry of Health and Family Welfare and  
Indian Council of Medical Research, New Delhi  
([dg@icmr.org.in](mailto:dg@icmr.org.in) ; [secydh@icmr.org.in](mailto:secydh@icmr.org.in))

Transformation of India into a modern developed nation has been by and large a success story. While a major challenge of equitable distribution of opportunities and facilities is yet to be effectively tackled, our institutions have grown and science agencies have made fair amount of investment into health research. Our health indicators though bad in some states have overall improved very well almost reaching the western levels in many states. This shows a robust health system and hard work by public health people. A developed society produces technology which takes care of the needs of its population and also competes globally. For this purpose let us move into more important area of innovations. Most have been uncomfortable of debate on this subject as record is not inspiring and it hurts the national pride. India is a civilization with legends like Sushruta and Charaka in medicine. It is argued that domination of colonial civilizations stifled our originality. There is truth in it for the pre- 1947 period. Then we need to analyze whether this spirit has been activated or revived during 63 years of Independent India.

**Did we achieve success with tools created by us?**

Public health architecture of India was thought of by a Britisher, Joseph Bhore just before Independence. While we have implemented it well with great amount of success and introduced some modifications, we cannot have the pride of creating it. Even today when we think of “public health” we are seriously considering importing it from well established western institutions and medical schools. There have been several examples of improvising affordable tools of intervention including hygiene by Indian investigators, but these are hardly thought and cited. When indigenous thinking is not respected, can we think of changing the atmosphere by attracting young talent?

Many of Indian clinicians and researchers have excelled in the bringing out the concepts of appropriately use of known drugs. Two examples of concepts of intermittent regimens for tuberculosis and leprosy came from the research carried out by Indian Investigators. Concepts of Current DOTS and MDT in leprosy including new uniform regimen in leprosy have origins in India. It is a different matter that after others accepted it, our policy makers gave recognition. There are several other examples in different branches of medicine and surgery where new methods of diagnosis and intervention have been developed in India.

Since independence, Govt. of India has given special emphasis on the development of science in the Country. There are a large number of active scientists working in different disciplines of biological sciences and producing good leads. Often we find that these are not translated into products or useable knowledge such as treatment methods. As a result, in India the public always remain unsure of the output produced by different research efforts.

### **Stages of translation and role of different science agencies**

So far the discussion was on downstream part of translation. As translation has many levels starting with new leads from biological and behavioural research and ending up with usable products/ processes, we need to start our critical analysis from beginning. We should create our knowledge, develop new molecules/ products for diagnosis and treatment in an affordable manner has been the dream nurtured by many Indians – scientists, politicians, administrators and common man. Several science agencies such as DST, DBT, CSIR, ICMR and DRDO have invested fairly well in basic and applied research. ICAR has been doing its part by focusing on production of adequate amount of right kind of eatables of vegetable and animal origin and also partnering with ICMR on control of zoonotic diseases. Department of Atomic Energy, Department of Space, Department of Information technology and other user Ministries like Women and Child Development, Environment and Forests; Rural Development etc. are providing / are willing to provide their collaborative support. With research funded by these agencies, a large number of leads, potentially useful diagnostics and therapeutics have been identified / developed. But how many have reached the final destination? It is a fact that very few tools or products developed in India are available for use, others remain restricted to their developer's labs at best. Why it has happened? How we can turn around by removing the roadblocks? To start with, I will like to discuss on the efforts of various science agencies including ICMR.

### **ICMR**

During the last two years, ICMR has created a system of translational research in which the leads obtained by its scientists as well as other researchers in the country are being explored for their application. ICMR is concentrating on more than 50 such leads for development of new tools for vector control, diagnostic methods for various infectious diseases including dengue and chikungunya, lung fluke, tuberculosis; new treatment methods to improve the treatment of tuberculosis, leprosy, cancer and many other conditions. ICMR institutions are partnering with other for testing of anti-malarial drugs, vaccines for different infectious diseases. Health and Family Welfare Minister personally took interest in coordinating efforts on H1 N1 vaccines, H1 N1 diagnostics and more recently affordable diagnostic methods for diabetes.



Twenty six translational research cells have been established at ICMR's Institutes/Centres. A translational research cell has also been established at ICMR Head quarters which look into the programmes of ICMR's Institutes/Centres under translational research and assist in carrying forward their technologies for implementation. One hundred and two (102) technologies / programmes of ICMR's Institutes/Centres were identified, out of which 53 top priority technologies / programmes were short listed to carry forward on a priority basis so that the technologies so developed could be utilized into the health care system/clinical practice at the earliest. Mostly the emphasis is on diagnostic methods for example Viral diseases, viz. Dengue, chikungunya, Hepatitis, Polio, J.E., etc.; Tuberculosis; Leprosy; Diarrhoea including Cholera ; Lungs Fluke; Leptospirosis; Filariasis ; Kala Azar; Malaria ; Chlamydia; Cancer; Thalassemia; Osteoporosis ; Mental Health and Diabetes mellitus. Of these following diagnostic technologies are ready for use and steps are being taken for their introduction in to the national programmes/clinical practice : Kits for detection of IgM antibodies to detect dengue, japanese encephalitis (JE) & chikungunya viruses; PCR assay for dengue virus infection; A latex based agglutination technique for the detection of leptospiral antibodies; Recombinant IgM ELISA for the diagnosis of leptospirosis; Kit developed based on nucleic acid reverse dot blot hybridization techniques - colour detection method for detection of the 6 common Indian *β-thalassemia mutations* along with the 2 common abnormal hemoglobins, Hb E and Hb S; Antigen based ELISA diagnostic assay for diagnosis of pulmonary paragonimiasis; Detection of JE antigen from desiccated mosquitoes for monitoring of JE transmission, used as a disease surveillance tool and molecular assays for mycobacterial diseases. Most others should reach usable stage in next 2-3 years if interphase with industry and other stake holders is established successfully.

### **Other Science agencies**

Many other governmental science agencies have invested heavily in health research. As my knowledge and details will not be exhaustive about the contributions made by these departments, I will just illustrate few examples. CSIR laboratories have developed several drugs that could be used to improve the treatment of tuberculosis, malaria, leishmaniasis diabetes mellitus and other conditions. Products from CSIR are available for fertility control. Several devices / appliances from CSIR are also ready. Open Source Drug Discovery (OSDD) programme of CSIR is creating waves. Department of Biotechnology (DBT) has made a major impact on development of biotechnology related products - several diagnostics, vaccines and other health care products have been developed with financial support from DBT. Department of Science and Technology (DST) has funded biomedical basic and applied research in a significant manner. Areas include those pertaining to infectious and non infectious diseases. DST funded research has influenced almost all facets of medical sciences. Many leads from this research including newer areas such as nanotechnology have been available for quite some time. Similarly DRDO has

developed several methods for diagnosis of infectious diseases, bioremediation, vector control as well as alternate more nutritious foods. Good affordable equipment such as respirators have been developed by DRDO laboratories. Likewise we can list many significant contributions from Departments of Atomic Energy, Space, Information Technology, Department of Environment and Forests; as well as others who are contributing to processes.

## Roadblocks

There could be several types of roadblocks which are hampering this progress. Last two years in my new position have brought me much closer to the reality. Based on this experience I have identified some key factors. These include mindset of user community, regulators and peer groups, funds, human resource, infrastructure for development and evaluation; infrastructure for their usage in the health infrastructure usage as well as commitment of developers, industry and others. I would like to share my thoughts and analysis on these issues.

- (i) **Mindset of user community:** In a developing society, mindset of user community specially the middle class is a major driver of industrial growth. It is a hard fact that a major section of our medical fraternity is suffering from this colonial inferiority complex. It is possibly also influenced by the mind set of public that will pay for the services that have subconscious fixation for “foreign”. As a result, our indigenous “Indian” products (especially micro devices, appliances) start with a big disadvantage again “imported” varieties where quite often we do not ask for any information about their quality data. There is no easy way of changing the perceptions; some good examples can only bring these changes. Government and enlightened people within the civil society will have to work hard to catalyze such changes.
- (ii) **Regulators and peer groups:** Translation of basic knowledge into products that finally reach the destination requires all support from peer groups for evaluation and field testing and finally regulatory approvals. Due to various reasons this process has been very slow. There are very laboratories (in government and private sectors) that could quickly provide either samples or carry out independent evaluation, as a result developers including small industrial units have to run from pillar to post to get it done. As a result, many give up. Similarly, regulatory structure has not been able to keep pace with the changing needs. It takes a long time to develop rules and implement them. This leads to both anarchy as well as law abiding people standing in the “waiting line” indefinitely. Department of Biotechnology has taken major initiatives such as creation of dedicated institutes on translation and a grand vision for translation in this country. I am sure that this road will lead to success but it is hard to predict the future

speed and all the factors that would impact the process. When there is political commitment and by administrative action we make these things easier and user friendly success comes as fast as was seen at the time of H1N1 pandemic. Things are changing for the better and we hope that we will be able to make our systems self sufficient and user friendly in the coming years. Market demands lead to creation of facilities like Clinical research organizations (CROs) in the recent past but that does not happen for all the sectors which are important but do not have the interest of market forces at that moment of time.

- (iii) **Funds:** There has been a perception that not enough money for translation has been available. It is true to some extent but is not the sole hindering factor. There could be examples where this would have slowed down the progress but quite often it is the other way around. Several agencies like DBT, DRDO have invested heavily in this type of work.
- (iv) **Human resource:** In my perception human resource is the major limiting factor. Our scientific community usually likes to investigate scientifically interesting or glamorous ideas rather on spend time on developing new tools that may benefit the masses. As a result a large number of leads remain lying in the heap of “new unutilized knowledge”. Increasing the investments many fold by science departments and also the industry in the recent years has not led to parallel increase in the output because of this factor. I am personally aware of this aspect in my organization as well as other science organizations with whom I have worked closely. This glamour has to be brought in by several innovative methods including special awards by developing a closely monitored national plan.
- (v) **Infrastructure for development and evaluation:** For harnessing indigenously created basic knowledge for development of products we need adequate infrastructure. Equally important is the availability of laboratories with well characterized biological specimens for testing. Things are so difficult that even motivated people in the industry give up. Different Government organizations and private institutions are trying to create such set ups. Perhaps we need a coherent plan to create such networks on priority. Translational Health Research Institute and many nodal institutes are expected to play significant role in this process.
- (vi) **Infrastructure for the usage of new technology/tools:** All of us aware that in different parts of the country health infrastructure is not developed in an ideal way. Government run hospitals have their problems of manpower and infrastructure in several states; medical leaderships even in well developed states lacks vision and have inadequate knowledge of technology advances versus their potential to

improve the patient care individually and at public health level. Indian researchers were among the first ten to develop molecular diagnostics for tuberculosis but there were no user laboratories in most parts of the country till very recently. There would be many more examples. Excellent set ups have come up in tertiary hospitals in government and private sectors but the access and thus the market scale is extremely limited. Department of Health Research (DHR) is engaged in an exercise to improve this infrastructure and change the atmosphere across the medical colleges as well as other state institutions with the main goal of taking the technology to people.

- (vii) **Commitment of innovators, industry and others:** To create a vibrant network conducive for translation research, strong commitment from innovators in government as well as private set ups is required. Industry and several players (regulators as well as promoters) will have to be active and work in a mission mode. There will have to be some market assurance to industry and farmers to produce what the people need. Market forces will drive the process once it reaches the market.

ICMR in its centenary year is engaged in a soul searching exercise. I will like to remind the listeners of an important message of Sh. Ghulam Nabi Azad, Hon. Health and family Welfare Minister delivered to us on this occasion. To quote “I will urge ICMR scientists to put special efforts on translational programmes as the country needs these technologies now and cannot wait indefinitely”. In reality this applies to all of us within ICMR and also outside ICMR.

I am honoured to deliver this oration. Prof. A.S. Paintal was a strong advocate of harnessing simple and usable knowledge. I am happy to deliver this talk on a topic which was close to his heart. I am happy at the changes that are happening but there are miles to go! This presentation contains reflections of an individual and not of Government or all stake holders. I may have missed some vital points or might have over emphasized some issues that could be considered trivial by others. I must reiterate my respect to all individuals, departments and other stake holders who have contributed and or are contributing. We have to debate and work together for success. In my entire career, I have grown as a part of progressive government structure and I consider myself to be privileged. I am sure that we will succeed in removing all the roadblocks and create an ideal atmosphere for translation and implementation ultimately for creating a healthy and productive nation.

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This is the Paintal Memorial lecture of 2010, delivered by Dr.V.M.Katoch, Secretary, Department of Health Research, Ministry of Health and Family Welfare (Govt. of India) and Director-General, Indian Council of Medical Research, New Delhi, on March 12, 2011 at Vigyan Bhavan, New Delhi.

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## **The Role of Science and Spirituality in Strategic Decision Making**

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**Abstract:** After a brief introduction to the approaches taken by science and spirituality, this article focuses upon the role of science and spirituality in strategic decision making. Firstly, the basic limitations in the approaches followed commonly in science and spirituality have been addressed due to which they are regarded to be incompatible. Eventually, the complimentary role of science and spirituality in strategic decision making is addressed that involves devising key plans and policies so as to maximize social benefit. Finally, intuition as a basic concept in leadership, strategies and decision making is conveyed, which can be nurtured with an open minded approach. In conclusion, the depth and clarity of thought in conceptualizing open minded approach refers to adapting the spiritual process in the society.

### **Science and Spirituality**

Science and Spirituality are the search for truth. One is the search for the truths of the physical world; the other the search for the truth of the nature of consciousness. As such there is no conflict between them. Science is the systematic study of anything that can be examined, tested, verified and is ever evolving wealth of information. It is imbibed in our daily lives. Spirituality, on the other hand, is often very unscientific in its approach to self liberation and is the realm of the individual relationship to a higher power concerned with inner experiences of connecting to the source of creation.

### **Science and Spirituality - Essentiality in our Life**

Science alone can never explain everything in the universe without the complementary help of Spirituality. Over few decades, we have been gaining expertise in technical and biological spheres and domains but still Science cannot provide lucid answers on all subject matters of the universe like our emotions, dreams and fundamental realities of mind. The subject of meditation and the overall benefit of well being, it seems to provide for those who practice it. Medical Science has no definitive answers what actually transpires within your mind and body to bring you at a generally positive and better feeling and state-of-mind.

Can Science and Technology eliminate pain at the mental level? Unfortunately, modern machines can manufacture everything but a happy mind and treatment on the physical level cannot change your mental disposition. I

would say, while Science gets us physical comforts, spirituality brings us mental calm.

While Science advances our knowledge of this universal dimension and gives us opportunities to experience and learn and grow as individuals, Spirituality on the other hand helps us individually with; who we eternally are, understand our purpose in life and channelize us towards the appreciable paths of life. In ancient times, Seers and Sages used to consider knowledge to be Sacred and they demonstrated selfless scientific minds. Now, with the ever growing impact of Science on our lives, spirituality has a greater role to play in reminding us of our humanity. There is no contradiction between the two. Each gives us valuable insights into the other. Swami Vivekananda, the architect of the Indian Renaissance, anticipated the merging of Vedanta and modern Science.

### **Why Science and Spirituality could not Move Together**

Scientific research of the physical world enabled man to understand laws of the material world. But the infinite power of the inner self, the consciousness-force of pure sentiments of love and compassion, noble thoughts, etc. remained unknown and ignored. As a result, materialistic civilization overtook the charge of life and the key role of sublime consciousness and associated faculties got neglected in the mist of illusions and ignorance. Science and Spirituality have somehow been mutually contradicting in their approaches and have always regarded each other's principles and objectives as superficial. This negative competition has deprived both of their complementary roles towards holistic human growth. When extrovert hunt for prosperity in terms of materialistic resources and comforts and their possession became the sole objective of life, why would one bother to understand the importance and utility of noble thinking, virtuous character, and altruistic sentiments? The generous attitude of benevolence, selfless cooperation and adoption of ethical conduct emanate from and expand with the support of spiritually evolved emotions. Unfortunately, Science and spirituality, both being gigantic streams of search for truth have, because of the way they have been followed and practiced, largely remained compartmentalized and mutually exclusive. Modern science has exhaustively excavated, extracted and exploited the natural resources and gained enormous mastery in the physical world. However, for want of the guiding light of spirituality, it could not really make a positively constructive, underlying the physical phenomena. Matter and the visible world became the prominent foci of its advancement and so the objectives of life and its prime purpose got sidetracked and almost lost from sight. What was really needed was, to also search for solutions to the riddles of human psychology and the complexities that entangle the basic aims of life.

## **Integrating Science with Spirituality**

Our technical capabilities are increasing at an enormous and unprecedented rate. In contrast, our spirituality and values are developing much more slowly. This has created a purpose and meaning beyond the necessities of daily existence. Our scientific understanding has undermined many conventional approaches to spirituality at the very time we need to strengthen these capacities. The source of the difficulty may hold the key to the solution. Science is widely accepted because it is physical. It looks at the world as it is searching for the simplest possible description. Discovery of simple descriptive laws has led to enormous power to control the phenomena, which the laws describe and enhances our technical prowess.

The convictions and practices of spirituality weaken their authenticity in absence of scientific spirit and openness. The philosophy and teachings of spirituality without having scientific approach lose their relevance and originality in the smog of blind faith and superstition. The grains of Scientific research will serve the real purpose and will be beneficial in the true sense only if it opens its barriers and goes beyond “What and How?” to see “Why and What for?” - to encompass the search for the dignity of humanity and ultimate aim of human life. Plato has also observed that the completeness and ultimate progress of Science lies in its entry into the spheres of spirituality.

The Science remains narrow and incomplete without incorporating spirituality, which is the base of enlightened evolution of the mental and emotional domains. Science without spirituality has no bonds of values and so there is an obvious danger of its becoming amoral and apathetic. This is what we are witnessing today. Science today has undoubtedly made grand constructive contributions to the external development of human civilization, but it has unscrupulously invented dreaded productions of mass destruction and global devastation. Its unchallenged might and reckless advancement appear to threaten the very existence of life on earth. It is high time the tyranny of this unbridled blind power is controlled and made accountable to humanity. The role of spirituality is self-evident in this regard.

Science and Technology can generate means of progress but not the means of peaceful co-existence and happiness; neither can these nurture moral values and inner strength. Science and technology may produce material wealth and prosperity but not the nectar of soothing emotions, spring of love and compassion or light of courage, wisdom and sagacity. Until scientific capabilities are integrated with values to fill-in this gap and both complementary powers are encouraged to flourish within mutual cooperation, the present trends of progress would be inexorably hurtling towards the lethal edge of global extinction.

### **Its Complimentary Role in Strategic Decision Making**

Strategic decision making is a process of aligning people's attitudes by devising key plans, policies and laying down of framework for organization structure and getting them committed to work for a common goal to the maximum social benefit - in search of excellence, excellence and only excellence. Many eminent Scientists and Spiritualists have observed that imbalance or disharmony in any system, any action, generates problems of one kind or the other. Narrow-minded approach or lack of deliberate considerations eventually leads to inadequate and problematic consequences, even though it might seem to offer some immediate success. This is because of the mis-interpretation or negligence of some of the crucial aspects of a situation. In order to achieve an orderly, well-organized, balanced and fulfilling human life, we need to pay due attention and give proper importance to the necessities of its interwoven physical, intellectual, mental and spiritual realms in the individual and social domains.

A scientist whose character is wholly positive and who is open to the spiritual knowledge of the origins and constitution of matter can make discoveries that will neutralize the negative effects of fission and harness the powers of fusion. The Vedic rishis worked for raising and expanding their powers of consciousness and then directed that consciousness to illuminate the reality of nature. They discovered the underlying reality from which all phenomena are created. Sri Aurobindo says this discovery is of greater practical significance to the world than the discoveries of Copernicus and Newton. In *The Life Divine*, he has described in logical and rational terms that reality and the complete process of creation by which it manifests in the universe as mind, life and matter and evolves from matter higher forms of life and higher levels of consciousness.

Spiritual vision reveals that the fundamental reality and the process of creation are the same in all fields and planes of existence. Only the forms and expressions of manifestation vary. The laws of physical and social evolution are the same. Mastery of the process in any field of life implies the knowledge and power for accomplishment in that field and leads effectively in planning and decision making process.

We have sought to apply the knowledge of this process to many fields. At the level of the individual, this mastery is the knowledge and power of the Complete Act, which is the capacity to make any act generate the desired results.

**Leadership, Strategies and Decision making comes by intuitions. Intuitions can arise in a mind that is truly open-minded.**

Open-mindedness is that state of mind which can maintain a calm, positive poise, or regain when unsettled, in the midst of all the external vagaries of work



life and social existence. It is quite natural that a stressful mind may wander and will hinder the effective decision making. Internally constancy and peace are the pre-requisites for a healthy stress-free mind. So we must have a clear aim, a clear focus, a single pointed direction, total commitment, and thereafter the mind will not wander in different places for bringing out strategic decisions.

- Open-mindedness helps to receive direct knowledge which is inspiration, whereas otherwise one has to learn by indirect knowledge through inference and deduction.
- Open-mindedness helps one to achieve the state of consistency expected out of him, often described as “Manasa, Vacha, Karmanaa”, the state where one’s thoughts, speech and the actions coincide.
- Mind should be open to new ideas, not inhibited by worldly wisdom and should divest itself of existing ideas.

Open-mindedness is generally seen in persons who are naturally good and by virtue of their whole-hearted eternal efforts into the issues are capable of achieving greater success even in unfavorable circumstances. A human being consists of a marvelous amalgam of matter and consciousness force. The physical or the gross body is made up of the basic elements and their evolved reactions and results, so it’s healthy sustenance and vigorous functioning largely depend upon the balanced concentrations and activities of these vital constituents. The subtle or the conscious body - mind and the inner self, which also lies at the base of the living existence of the physical body, receives the transmitting energy from enlightened thinking and virtuous sentiments. The Vedic philosophy emphasizes the harmonious growth of both - the gross and the subtle realms. This comprehensive and integral approach lays the foundation of personal, familial, social and global development in an ideal way. Discrepancies, imbalances or disorder in any sphere of life causes different kinds of complications and difficulties of varied nature, which directly or indirectly hinder, retard and even reverse the graph of sensitive planning and decision making processes and subsequently reducing healthy soul growth and ascent.

Science contributes to the civilization and advancement of materialistic resources but spirituality holds the key to the harmonious and virtuous development of personality. Science reveals the mysteries of Nature in the manifested world, while spirituality unfolds the secrets and objectives of its subtle existence. Analysis of the structure and perceivable properties of things is the subject matter of the different branches of material science. Decipheration and study of the origin and deepest purpose of life pertains to the fields of spirituality. Thus, broadly speaking, in terms of Planning, Leadership and Decision making aspects the former deals with answering "What and how?" and the latter with "Why and What for?" Both search for truth in their own fields of inquiry and helps in paving the way ahead in diversified situations. Like the

two banks of a river or two invisible edges of the horizon, both are perennially connected with each other but seem to stand far apart. Mutual cooperation and integration of the two is most desired for their relevance and necessity in human life.

Today's new breed of Intellectuals, comprising quantum physicists, cyberneticists, molecular biologists, mathematicians and computer scientists, have all largely explored the depths of frontier sciences and have somehow been introduced to the oneness of it all. Physicists are telling us that the observer affects the observation. Science is showing that we no longer perform objective experiments. Instead, we participate in subjective experiments because our minds, thoughts and expectations will bring the results we expect. It is not that we are changing reality, but that the definition of reality itself is changing. Reality is no longer the external unaffected something out there, that we can accept, deny, challenge, overcome, or resign to. It is something that is inside us. But that is only half the truth. The other half is that we are inside 'it'. In this modern world the art of devising strategies and decision making has become a part and parcel of everyday life, be it at home, in the office or factory and in Government. In all organizations, where a group of human beings assemble for a common purpose, pooling of resources, finance and planning, priorities, policies and practice play a vital role in decision making. It is noteworthy to mention that management integrated with values pave systematic way for carrying out activities in any field of human effort and is the most crucial aspect for devising potential strategies. Management plays a vital role in decision making and should focus more on leadership skills on spiritual and humane footing e.g. establishing vision and goals, communicating the vision and goals and guiding others to accomplish them. Science amalgamated with spirituality always asserts that leadership must be more facilitative, participative and empowering in how visions and goals are established and carried out. Its task is to make people capable of joint performance to make their weaknesses irrelevant and create harmony in working together - equilibrium in thoughts and actions, goals and achievements, plans and performance, products and markets. It resolves situations of scarcity, be they in the physical, technical or human fields, through maximum utilization with the minimum available processes to achieve the goal.

Lack of management causes deterioration in effective decision making and hence leads to disorder, confusion, wastage, delay, destruction and even depression. Managing men, money and materials in the best possible way according to circumstances and environment is the most important and essential factor for a successful management. The critical question in all managers' minds is how to be effective in the decision making. The answer to this fundamental question is found in the Bhagavad Gita, which repeatedly proclaims that "you must try to manage yourself." The reason is that unless a strategist reaches a level of excellence and effectiveness, he or she will be merely a face in the crowd and his key decisions will be devoid of values.

Bhagavad Gita testimonies the decision making process and emphasizes that there is an important distinction between effectiveness and efficiency in managing.

- Effectiveness is doing the right things.
- Efficiency is doing things right.

During the curtain raiser before the Mahabharata War, Duryodhana chose Sri Krishna's large Army for his help while Arjuna selected Sri Krishna's wisdom for his support. This episode gives us a clue as to the nature of effective decision - the former chose numbers, the latter wisdom.

### **Conclusions**

While the material based modern science has designed the sophisticated tools to shape the gross materialistic facets and external structure of progress for integrating capabilities on technological fronts, the inner foundation of this outer structure is still embedded in the indwelling spirit in the individual.

A thorough understanding of human life and decision making strategies becomes feasible by a comprehensive study of the interrelationship between the human mind, nature and the omnipresent consciousness force. The major schools of thought and branches of knowledge that have emanated from the quest for fathoming this relationship have had entirely different approaches. A spiritual mind with scientific approach, aligning fully with the cause, will always get the ideas from the space domain and make the right decision, which will ultimately lead to the benefit of the human kind.

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## On Indian research being plagiarized by foreign bylines

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Every research project attempts to answer some question posed by existing knowledge, and many research groups may be independently addressing the same question (unless the question is unimportant!). For this reason, we work hard to claim priority in providing an answer, we hesitate to publicize interim results, and worry about unauthorized access to our submitted manuscripts. Non-availability of advanced facilities to university researchers and paucity of established Indian journals, are two relevant handicaps as we compete for priority internationally. This is particularly important for young researchers in new universities and in other emerging bylines.

When the attempted answer is based however on original ideas that are really out-of-the-box, then the foreign competing groups react with a time lag because of their inherent disbelief. This time lag can be exploited, by those from emerging bylines (who are also more likely to think out-of-the-box), to overcome the handicap in speed of experiments. I will discuss two separate cases where foreign bylines attempted to usurp credit in their publications in a reputed journal, for research involving such ideas from the emerging bylines of Indore. In both cases public-domain apologies have appeared through "Errata" in the journal, but no apology has yet been possible in a related attempt in an e-print archive. There is a need for SSV to cover such exigencies in their mandate, since our emerging bylines will produce more original ideas in times to come.

To understand the history-dependent magnetic behaviour of some materials, a group of researchers at Indore had made some interesting postulates in 2001. Prominent among these was the idea that the kinetics of a first order magnetic transition can be arrested, just like the kinetics of the freezing transition is arrested when a structural glass is formed. Over the last ten years various researchers at Indore have worked to push these ideas, and supporting these with 'failure-test' experiments on various materials showing first order magnetic transitions, have introduced terms (and concepts of) "magnetic glass", "kinetic arrest", and "CHUF protocol". Both the cases I shall discuss, involve publications that attempted to usurp credit for our work.

**Case 1:** Following our published ideas [1, 2] on kinetic arrest across a first order magnetic transition, a paper appeared [3] in Physical Review B that applied these ideas to observations on a new material. Only [2] was cited at one place, and there were no references to the two papers [1] that had appeared much earlier in the same journal. This 'idea plagiarism' was compounded by close reproduction of almost 500 words of text from our paper [2] in the main part of their paper [3],

with the single citation appearing in an innocuous way at the end of this text. We complained to the Editors, and an Erratum appeared [4]. This identified the text in [3] that was described euphemistically as ‘very closely correlated’ with our paper [2]. The Erratum also recorded that the closely correlated text had deleted our two references to our earlier papers! The matter is corrected for the records, but the correction is very weak given the level of the ethical misdemeanor. As I was informed by the Editors in another context, “Whether to correct this error, and the method for correcting this error, is a decision which must be made by the editor, and is not subject to a determination made by any of the other parties involved” and “the appropriate way of correcting the scientific record is for the author to point out the omission in an Erratum, despite the shortcomings of this action.” The shortcoming I had pointed out, substantiated with data, was that hardly anyone reads an Erratum.

**Case 2:** Following our published ideas introducing the “Cooling and heating in unequal field (CHUF)” protocol [5], we wrote many papers exploiting this unconventional and specially designed protocol and it was also explained in an article in Physics News. Prof Raveau was present when Dr Alok Banerjee gave a talk on this work in a conference in Kolkata in February 2009. While the concepts of “kinetic arrest” across a first order magnetic transition were being exploited by authors from abroad (giving us credit) in multiferroic materials [6,7], and in magnetic shape memory alloys [8], the idea of “CHUF” was exploited by researchers from Indore and by students from other educational institutes who used our facilities (see [9,10]). Given this, we were amazed to see the paper from Prof Raveau’s group [11], where “kinetic arrest”, “magnetic glass” and “CHUF” were used extensively, a whole section was devoted to introduce, utilize, and applaud the CHUF protocol. What amazed us was that this section described the protocol as ‘specially designed’, and carried no reference in the entire section. The entire paper had no reference to our various publications on CHUF, no credit was given and was therefore, implicitly and quietly, usurped by the authors. We were also amazed that the thorough refereeing process of a reputed journal allowed this to slip through. Our protest to the editors resulted in an apology [12], but there appears to be no genuine remorse from the authors. As I noted earlier, hardly anyone reads an Erratum. Prof Raveau’s group had uploaded the manuscript version of this paper, with its minor differences, on a popular e-print archive [13]. We uploaded a comment [14] highlighting various problems. This site allows the authors to upload a revised version. If there were genuine remorse then a corrected version, where we are given credit at all places where it is due, should have been uploaded. Does the persistence with an unethical version not constitute plagiarism?

We have been able to get ethical misconduct acknowledged and rectified to some extent. I believe our limited success holds some lessons for our young students from emerging bylines like ours. We must educate our Ph D students on how they should protect themselves from plagiarism, both from being

perpetrators and from being victims. We must think and debate while designing an appropriate coursework.

More needs to be done to get such ethical misconduct rectified. I feel that our ethics bodies are concentrating on when we are perpetrators, and get much worked up. They need to also provide a “will-take-up-cudgels” support when we are the victims.

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Concern was expressed by Dr.Praveen Chaddah, Director, UGC-DAE Consortium for Scientific Research, University Campus, Khandwa Road, Indore 452017. The link is available at <http://www.csr.res.in/csr/director/message.pdf>

## **Management of Plagiarism and Misconduct in USA Ivy League and other Schools**

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### **Academic Plagiarism**

The Oxford Dictionary defines plagiarism as “**the taking and using as one’s own of the thought, writing or invention of another**”. Although in the time we live in, the idea of using one’s thought as source material does not seem to be of relevance and acceptable. That’s because the world today is unified through the internet and the transmission of thought is the norms of existence. The source material, in true sense, should include published primary and secondary materials as well as information and opinions that are acquired from other persons. The definition of plagiarism thus could be reframed as the reproduction of other’s idea, result, and methods, without giving due credit to the owner. There are two categories of problems one has to deal with - (1) plagiarism by students; (2) plagiarism by Professors although self plagiarism has equally been practiced by both. Although this could be a general phenomenon across the world today, in this essay, selective incidents would be highlighted only in the context of USA. A very common practice that is visible in university campus is that students practice self-plagiarization by modifying a term paper that was written for one class and then submitting again with modifications for credit in another class, without informing the instructor or supervisor. Academicians self-plagiarize by quoting part of one publication in a subsequent publication, without citing an earlier publication. The internet opportunity has also been blamed for this mishap and as a consequence, an unimaginable breach of trust in the academic world is noticeable across the university system.

In this essay I shall explore how frequent plagiarism in USA has been used as a self-destructive educational tool by both students and academicians and at the same time, how effectively the USA university system puts break in to this unethical practice, specifically, in Ivy league schools in the USA. This might be useful for Indian readers to get knowledge about USA system.

### **Frequency**

How frequently do plagiarism cases arise in US universities? The data shows that the plagiarism has been a serious issue in US universities. In 2005, in a survey at Duke University Centre for academic integrity, 37% admitted copying Internet material without attribution compared with 10% in 1999 (1,2). In 2008, the researchers at the University of Texas Southwestern Medical Centre at Dallas, used a computer-based text-searching tool to analyze millions of randomly selected research abstracts. The analysis of Medline, a database of

biomedical research articles, found 9120 entries “with high levels of citation similarity and no overlapping authors,” including 212 pairs of articles “with signs of potential plagiarism”. Harold Garner, a professor of Biochemistry at UT and executive director of the Virginia Bioinformatics Institute at Virginia Tech, who created the eTBLAST plagiarism software, also wrote an article in *Nature* (3). A computerized search of several million scientific-journal articles revealed thousands of cases in which one article had large similarities with another article. 150 suspected cases of plagiarism were detected in March 2009. As Garner put it in a radio interview, "Subsequent ethics investigations resulted in 56 retractions within a few months (4). By November 2011, 12 (20 percent) of those "retracted" papers were still not so tagged in PubMed. Another two were labeled with errata that point to a website warning the papers are "duplicate", more than 95 percent of the text was identical, with no similar co-authors. Later, a report by Garner in *Science* (5) represented a significant advance over his earlier article in *Nature* which led to 83 internal investigations at scientific journals. As a result, in 43 cases articles were retracted which compares to only 17 such retractions last year, a more typical annual figure. According to Garner, “such a case of plagiarism or duplication can have serious medical consequences as it could lead a doctor who is investigating a patient’s condition to believe a scientific finding is more recent, or perhaps more reliable, because of its repeated appearance in medical journals”. This information shows that scientific misconduct is at a high stage in USA.

### Harvard Policy

In 2006, Harvard College, the university's undergraduate school, had licensed a software (6) (<http://Turnitin.com>) and had made it available to all the faculty, according to John Barrie, president of iParadigms LLC, the Oakland, California- based company. Harvard spokesman Robert Mitchell had first initiated the use of this software by the faculty on a department-by-department basis in the college, which has 6,613 students. Turnitin receives digital copies of up to 80,000 papers a day. The software scans each one against a daily download of 60 million internet pages, 22 million student works in its database and 10,000 periodicals. “The software is used at nearly 6,000 institutions in 90 countries”, according to Barrie. The U.S. clients include 1,820 colleges and universities, or 44 percent of all such schools. This development seems to be significant in detecting plagiarism in a constructive manner with deterrence.

In lieu of this development, Harvard had drawn guidelines (7) to students which strongly dictate, “It is expected that all homework assignments, projects, lab reports, papers, theses, and examinations and any other work submitted for academic credit will be the student’s own. Students should always take great care to distinguish their own ideas and knowledge from information derived from sources. The term “sources” includes not only primary and secondary material published in print or online, but **also information and opinions gained directly from other people**. Quotations must be placed properly within quotation marks



and must be cited fully. In addition, all paraphrased material must be acknowledged completely. Whenever ideas or facts are derived from a student's reading and research or from a student's own writings, the sources must be indicated. It is the expectation of every course that all work submitted for a course or for any other academic purpose will have been done solely for that course or for that purpose. If the same or similar work is to be submitted to any other course or used for any other academic purpose within the College, the prior written permission of the instructor must be obtained. If the same or similar work is to be submitted to more than one course or used for more than one academic purpose within the College during the same term, the prior written permission of all instructors involved must be obtained. A student who submits the same or similar work to more than one course or for more than one academic purpose within the College without such prior permission is subject to disciplinary action, up to and including requirement to withdraw from the College."

### **Sample Cases & University Action**

The Harvard has also been in the lime light since a long time in issues of plagiarism. However, a few reported cases below would describe how prompt the Harvard is in cleaning up the mess unlike an Indian counterpart where authority puts a deaf ear or in many occasions, reward the perpetrators with a higher position to bury his past. In a highly publicized case, the behavioral psychologist Marc Hauser had resigned (8) from the Harvard faculty, 11 months after the university accused him of being "solely responsible" for eight counts of scientific misconduct. Three of his papers were retracted (9-11). Dr. Hauser ascribed to an error in the computer-controlled protocol for alternating test and control experiments. The university had raided his laboratory, after complaints by some of his students. Although Dr. Hauser was allowed to repeat the experiments and obtained the same results, which were accepted as valid by the two journals in question, the university was not yielding. The other five counts cited by the Harvard authorities apparently concerned errors that were corrected before publication. Hauser did not admit any wrongdoing and said, "I am deeply sorry for the problems this case has caused, I acknowledge that I made some significant mistakes". Michael D. Smith, Dean of Harvard's Faculty of Arts and Sciences, sent a long email message to the members of the faculty on August 2010, in describing the findings of scientific misconduct against Professor Marc Hauser. This case is unique as most people could not comprehend the reason of his resignation and at the same time Harvard sent a strong message of zero tolerance to plagiarism by people in higher position.

In the past (1989), one of the USA's most eminent psychiatrists Dr. Shervert H. Frazier at McLean Hospital, where he was psychiatrist-in-chief and general director (who earlier served as director of the National Institute of Mental Health, the Government's leading mental health agency, from 1984 to 1986 and had been president of the American College of Psychiatrists, a leading professional society) resigned from his positions at Harvard Medical School and

as head of one of its major teaching hospitals after he admitted plagiarizing large sections of four papers he wrote in medical journals and textbooks. After accepting the report of Harvard investigating committee that had found evidence of plagiarism in four papers and found "instances of careless scholarship" in three of the four, Dr. Daniel C. Tosteson, the Dean, had accepted Dr. Frazier's resignation (12). Further, at Harvard, Indian-American Student Kaavya Viswanathan's first novel, "How Opal Mehta Got Kissed, Got Wild, and Got a Life" was removed from the book stores by publisher Little Brown after it was found that the book contained passages from several others (13). Law professors Laurence Tribe and Charles Ogletree had also apologized in the past two years for failing to attribute the work of others in books they published.

In 2006, at Columbia Univ, Dr. Madonna Constantine was accused of plagiarism by her junior colleague Dr. Suniya S. Luthar. Her complaint was that Dr. Constantine had unfairly used portions of her writing. An investigation had concluded that the "Columbia University professor plagiarized repeatedly" (14). In February 2008, a law firm hired by Teachers College to investigate Constantine noted that over five years "numerous instances in which she used others' work without attribution in papers she published in academic journals" (15). Dr. Constantine was charged of plagiarism which she denied and claimed further that she was a victim of institutional racism. Dr. Luthar rebuffed such suggestions upon the argument that the inquiry was about race. She accused Constantine as "misguided and wrongheaded at best," noting that she herself is "a woman of color". The investigation was handled by a law firm rather than a faculty committee because of administration fears that a misstep might leave the college vulnerable to a lawsuit. In June 2008, Teachers College announced that Constantine would be fired. In October 2008, Constantine filed suit against the college, alleging that her termination was "arbitrary, irrational, and unauthorized, but the suit was "disposed" off. Constantine followed a defamation lawsuit against Columbia in April 2009. She lost one of 3 lawsuits against Teachers College in March 2010. In March of 2012, The New York State Supreme Court, Appellate Division, First Department, affirmed the dismissal of Constantine's defamation action against Columbia University. (16)

In 2012, a student Brian Corman, Columbia Valedictorian, in his graduation address plagiarized comedian Patton Oswalt (18). Columbia School of General Studies Dean Peter Awn confirmed that a portion of Valedictorian's remarks at this year's School of General Studies Class Day was taken from a comedy routine by Patton Oswalt. The Dean asserted "Columbia University and the School of General Studies do not condone or permit the use of someone else's work without proper citation". The student speaker has appropriately issued an apology to his classmates and to Mr. Oswalt for failing to provide such attribution.

Dr. Jason Yu was a tenured professor of civil engineering at the University of Utah and had failed to give credit to his co-author. The Academic Freedom

and Tenure Committee at that University charged Dr. Yu for plagiarism. There were two other cases of plagiarism against him at Virginia Polytechnic University where Dr. Yu had deprived authorship of two students who claimed that their contributions in the papers were 90%. The University of Utah Committee recommended Dr. Yu's suspension for one year without pay. The president of the University accepted this recommendation, although Dr. Yu appealed to the internal grievance committee. The grievance committee remanded to the Academic Freedom and Tenure Committee which recommended that Yu be permanently dismissed from the University, and the president accepted that recommendation. Yu then filed suit in federal district court, which found that "there was ample evidence to support the charges of plagiarism and that termination was permissible under the university's regulations. (17).

There are many other cases of plagiarism at other USA Schools. In 1969, an old case of plagiarism by a student at Southern Illinois University M. Jamil Hanifi was discovered. He had plagiarized material both from a book and an essay in his doctoral dissertation. He later published his dissertation in a book, of which "three of the nine substantive chapters were plagiarized." This was later discovered by both the authors in 1976 and 1977. Southern Illinois University learned of the plagiarism in 1981 when Dr. Hanifi was already a professor of anthropology at Northern Illinois University and was being considered as a new chairman of the department. Hanifi was given the choice of resigning or being fired, Hanifi chose to resign. He then filed a case alleging that his resignation was coerced. The court did not agree with him and he was found guilty.

In 1997, another case of misconduct came to light where, Kimon Angelides, a molecular physiologist at Baylor College of Medicine in Houston, was found guilty of fabricating data. She sued the university and its staff, including two former lab members, for slander and denial of due process. She lost the case in court. In a case like grant plagiaris, Eric Poehlman, a researcher formerly at the University of Vermont in Burlington found guilty of falsifying data in more than a dozen federal grant applications that landed him nearly \$3 million. Poehlman was sentenced to a year in prison for defrauding the government. This case should be noted carefully by Indian researchers how they could improve India's not very well accountable grant-aid system, where there is no accountability of the output from the funds given to influential people.

## **Conclusion**

The selective cases that I have described above represent varieties of plagiarism and misconduct cases in School of USA. One must appreciate that the handling of these cases by the USA Institutions seems quite fast, proper, and without delay. These cases also remind us most recent plagiarism cases in India by high ranking academicians. A de facto causal apology, after the case becomes public, is generally issued upon followed by closing of the file. It is a common belief that Indian higher education system lacks vision and our system

is unusually cold to bring plagiarism and misconduct charges against people holding higher positions. It could be speculated that an underlying inferiority complex of average Indian somehow suppresses their hidden virtue factor. Attitude of people in position that “nobody can touch me” seems true because in many instances their misconduct is duly rewarded in catapulting them in to higher positions. Ironically, India frequently waits to copy the west both for problems and solution; Indian academia might act, for self respect, in taking pre-emptive measures both in self-scoring good conduct and implement the same in our declining and deprived Institutions. Time has changed and in order to maintain academic excellence and in asserting India’s position in the world, Indians must learn from their USA colleagues how to strike surgically at the right point before it is too late.

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