Society for Scientific Values

Ethics in Scientific Research Development and Management

News And Views

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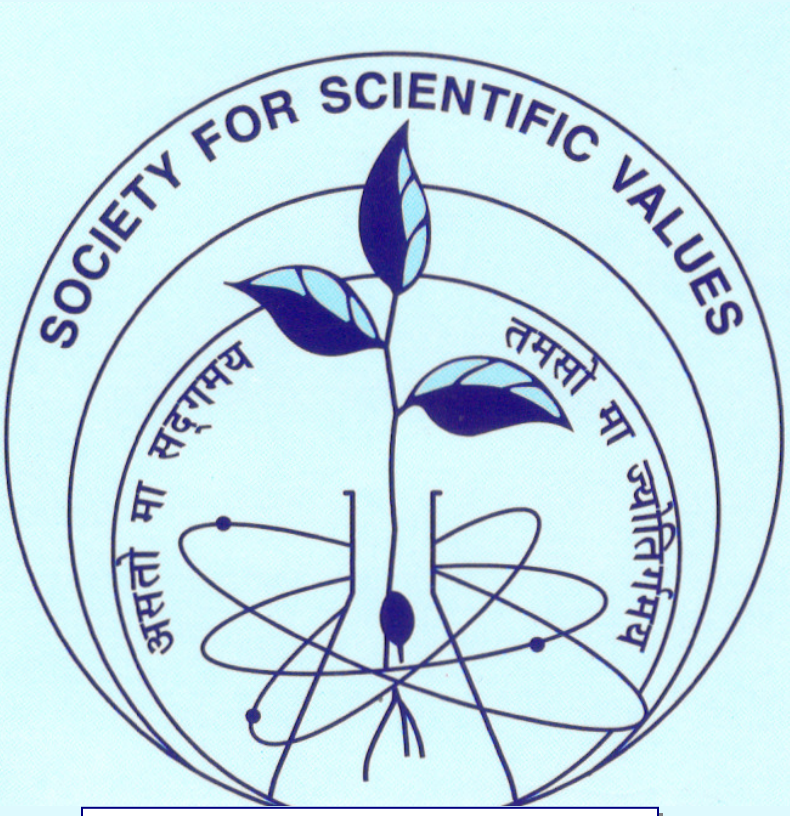

Let Truth Prevail

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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**

Contents

Corrigendum

The article by P. K. Nagar published in News & Views (Vol.5, 2007, http://www.scientificvalues.org/nw_v5_04_2007.pdf) stands withdrawn following a plagiarism complaint by Douglas Allchin of University of Minnesota, from his paper "Values in Science and Science Education" in International Handbook of Science Education published in 1998 (http://www1.umn.edu/ships/ethics/values.htm). The Executive Council of the Society for Scientific Values has decided to remove P. K. Nagar from the Editorial Advisory Committee and further bar him from publishing any material in our News & Views in future.

Editorial

In today's ever expanding world of Science & Technology, business & trade, competition and wish for instant fame and wealth, morality is the only code that can keep sanctity. Modern day philosopher Ayn Rand defined morality as "Judgment to distinguish right and wrong, vision to see the truth, courage to act upon it, dedication to stand by the good at any price" and "code of competence is the only morality that's on a gold standard".

For implementation of scientific values, expectation from scientists, university teachers and researchers are very high because they comprise the people who received highest academic degrees from universities world over. Education not only means teaching principles of science but also imparting ethical values for all round growth of each student as honest and intelligent creative human being who could be the pillars of strength in human society for advancement of scientific knowledge and prosperity of the world. Imperative in this process is the nurturing of meritocracy, fearlessness in facing the truth and upholding the justice at any cost. If Indian science has to progress and claim its strong presence in the global scenario, establishing excellence and credibility is of utmost importance. Towards this goal, including courses on ethical values in academic curriculum becomes a necessity. SSV is working towards such goal by helping formulating courses and workshops in different educational institutes.

As the world of science expands and technological advances make the world a global village, open access to scientific research publications becomes a debatable issue. Obligatory transfer of copyrights of research papers to publishing establishment is another debatable issue which needs reprisal sooner or later.

News & Views, in this issue brings some relevant news and some thought provoking articles. We, at SSV, condole the demise of Dr. A. R. Verma, a great physicist and one of the founder members of SSV – Dr. Tiwari recounts his association and formation of SSV in his memoir. To remember the initiation of SSV and its importance, the page from the journal 'Nature' is reproduced for the readers. Acknowledging the need of such watchdogs as SSV, different countries are forming societies to monitor fraud/misappropriation in scientific research output. As "There is no witness so terrible, no accuser so powerful as conscience which dwells within us" (Sophocles), it is the individual researcher who has to practice the scientific values. Creativity and excellence demand free mind and fair working atmosphere.

Why don't we all strive towards this?

Santa Chawla

From Pages of History ……..
Nature announced Formation of SSV

NATURE VOL. 326 9 APRIL 1987

Healthy scientific environment promoted by society in India

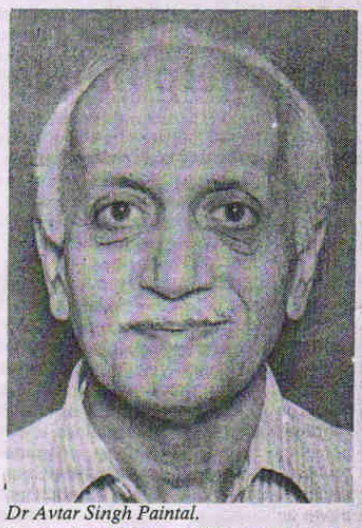
New Delhi

SOME 107 prominent Indian scientists have formed the Society for Scientific Values (SSV) to promote integrity, objectivity and ethical values in the pursuit of science. Its chief aim is to evolve a healthy scientific environment "free from prejudices, bureaucratic formalisms, dishonesty, propagation of unsubstantiated research claims, suppression of dissent, showmanship, sycophancy and political manipulation".

The architect of this new movement is Dr Avtar Singh Paintal, director-general of the Indian Council of Medical Research (ICMR). Paintal says that the climate for scientific research in India has deteriorated since independence not because of inadequate research facilities or salaries for scientists but due to the lack of a healthy scientific environment. And the society's chief objective is to promote, by personal and collective effort, the ethics and norms of science "not only for the progress of science and technology in the country but also for national character".

The membership of SSV is open only to scientists with a clean record who are serious in promoting the society's ideals in the organizations in which they work. Members should never have plagiarized, made false claims or indulged in any kind of dishonest activity and should not have allowed their names to be included in publications in which they have not been actively involved.

The movement is gradually showing results, says Paintal. The eligibility criterion for authorship of papers is becoming widely accepted. The society has also persuaded the government to set up conference facilities for scientists: SSV prohibits its members from attending conferences in expensive hotels beyond the reach of students and university scholars.



Dr Avtar Singh Paintal.

The practice of giving prizes year after year to the same group of politically influential scientists, who have long since ceased to do research, has become a scandal in India, and Paintal says that SSV hopes to put an end to this unhealthy tradition.

Paintal, has also redefined the goals of his own organization, ICMR. Although ICMR will continue to finance advanced research in medicine, it will chiefly be concerned with the application of existing technologies in solving India's health problems. Paintal's two priorities are the control of mosquitoes using the environmental approach and family planning using contraceptive pills.

According to Paintal, India has made a mistake by not promoting the pill. Fewer than 300,000 women in the whole of India at present use this method. At the instance of ICMR, the government is about to launch a major campaign advocating the use of the pill by women and of condoms by men.

On the control of malaria and filariasis, Paintal sees no need for new research. He says the only way to control these diseases is through elimination of the vector by environmental control, filling up ditches and improving sanitation. This approach has helped drastically to reduce the incidence of filariasis in Pondicherry and malaria in the Khera district of Gujarat. For the past 30 years, India has spent nearly half its health budget in the war against mosquitoes but without success. Paintal says that ICMR has shown that the battle can be won by simply cleaning up the environment instead of spending money on research on drugs, vaccines or insecticides.

K. S. Jayaraman

Another large telescope to be sited on Hawaii's Mauna Kea?

Washington

THE National Optical Astronomy Observatories (NOAO) have chosen Mauna Kea in Hawaii as the prospective site for a huge new instrument consisting of four harnessed 8-m telescopes. The summit of this extinct volcano already houses one of the world's largest family of telescopes.

The National New Technology Telescope (NNTT) is the most ambitious of several current proposals espoused by various sections of the US astronomical community. Its four mirrors, each much larger than anything cast or ground so far, can be made to function as four separate telescopes, or as a single telescope or as an interferometer. They will be made by a technique called spin-casting, in which molten ceramic is rotated at a constant speed as it cools, so that the solidified mass takes on a parabolic curve. The blank is then figured by traditional grinding and polishing.

A 2-m mirror has been made by this method, and preparations for making a 3.5-m blank are almost complete. If successfully cast and polished, the 3.5-m mirror will be used by the five-university Astrophysical Research Consortium for a new telescope at Apache Point, in the Sacramento Mountains of New Mexico.

The rival to Mauna Kea was Mt Graham, about 80 miles north-east of Tucson, Arizona. A comprehensive study was made of the scientific virtues of both sites, and Hawaii was preferred, according to NOAO, solely because its superior atmospheric conditions permit higher quality astronomical observations. But there was opposition to the Arizona site by environmental groups, particularly the Sierra Club. Mt Graham is remote and unspoiled, and has its own unique species of squirrel. Remoteness is, of course, a benefit for astronomy; observations at Kitt Peak are beginning to be marred by diffuse artificial lighting from Tucson and Phoenix.

The NNTT remains an astronomer's dream, with an expected cost of about $150 million. Present National Science Foundation (NSF) spending, at a rate of $2 million a year, supports only technological development, of which a good deal is needed. As well as using mirrors of unprecedented size, the NNTT will demand control systems and a mounting of largely untested abilities. Feasibility studies of these problems, says Pat Bautz at NSF, are aimed at producing a formal construction proposal within a few years. NSF will then decide whether to allocate funds from its regular astronomy budget.

These doubts are behind a feeling that it might be better to keep the NNTT and other big projects in abeyance for a few years while the privately funded Keck telescope gets under way. Construction of this device, a 36-element multiple-mirror telescope, will itself explore many of the technical problems the NNTT will have to face. The Keck project should be finished in 1992, and there is an understandable reluctance to commit federal funds before the verdict is in on that venture.

David Lindley

SSV activity highlights in the current period

Some cases of misconduct

- The case of Dr. Babbar, Reader, Delhi University, has been investigated by SSV. On the basis of information available with SSV, it became clear that Dr. Babbar has recycled material from his publications and that of others to increase his number of publications.

- The alleged scientific misconduct and plagiarisation of the papers of his predecessor by Prof Dyanand Dongaonkar, Secretary General, Association of Indian Universities has been investigated and verified. Prof. Dongaonkar and all members of the Executive Council of AIU have been requested to give their comments. However, despite two reminders, SSV has not heard anything.

- Mr Rait, a PhD student of the Electronics Department of the South Delhi Campus of DU, being guided by Profs Bhatnagar, P C Mathur and Sengupta has published the same research paper twice with different titles in two different international journals. SSV brought this serious case of plagiarism twice to the attention of Prof Deepak Pental, VC of DU, Prof Dinesh Singh, the Director of South Delhi Campus of DU, Prof Verma, and the Head of the Electronics Department and the supervisors of the student. None of these academics has responded, inquired into, or take any action on this very clear case of plagiarism by a Ph D student who was on the verge of getting his Ph.D from the University.

- SSV decided that the cases of (a) complaints of biased editors by Profs Karmeshu of JNU and Sitaramam, (b) plagiarisation by Profs Krishnan and Selladurai which have been verified be posted on the SSV website.

New cases under consideration with SSV

SSV is involved as a co-signatory of the PIL on vaccine, filed in the Supreme Court.

News pertinent to SSV's cause

Global

1. 10th World Congress of Bioethics: "Bioethics in a Globalised World", Singapore (28-31 July 2010)

The Division of Ethics of Science and Technology, Sector for Social and Human Sciences, UNESCO

The 10th World Congress of Bioethics (WCB), in conjunction with the 8th International Congress on Feminist Approaches to Bioethics, will be held in Singapore 28-31 July 2010. The theme of the Congress is "Bioethics in a Globalized World", focusing on cooperation through the communicative role of bioethics in a highly globalized world. It will be hosted by the Bioethics Advisory Committee of Singapore and will take place at the Suntec Singapore International Convention and Exhibition Centre.

Sub themes of the 10th WCB include:

- Global and regional perspectives on bioethics
- Justice, access to health care, and health care reform in a globalised world
- Ethics of global health governance
- Ethical issues in international health research
- Clinical ethics: local concerns, international perspectives
- Public health ethics in a global context
- Ethical issues relating to international development, aid and reconstruction
- Bioethics, health and the environment
- Ethics, enhancement and the future of the human species
- Ethical issues arising from research using human stem cells, embryos and new medical technologies
- Infectious disease control and the threat of global epidemics
- Biotechnology and bioengineering: local, regional and global debates on policy and ethics
- Globalization and commercialization in biomedicine
- Ethical issues relating to vulnerable and minority populations
- Inequalities and discrimination in health
- Food and security

Proposals for symposia should be submitted by **1 July 2009**.

Proposals for Paper and Poster Abstracts should be submitted by **1 December 2009**. All proposals should be sent via email to: abstracts@bioethics-singapore.org

For more information on submission format and registration, please visit the Congress website at: http://www.bioethics-singapore.org/wcb2010/

For more details on the 10th World Congress of Bioethics, please contact:

Bioethics Advisory Committee Secretariat

Email: contactus@bioethics-singapore.org, Phone: +65 6773 6475, Fax: +65 6478 9956

UNESCO Global Ethics Observatory (GEObs). For more information, please visit the observatory's website at: **www.unesco.org/shs/ethics/geobs**

2. Recommendations of the World Commission of the Ethics of Scientific Knowledge and Technology (COMEST) at its Sixth Ordinary Session at Kuala Lumpur, Malaysia (16 - 19 June 2009)

The World Commission of the Ethics of Scientific Knowledge and Technology (COMEST) held its Sixth Ordinary Session in Kuala Lumpur, from the 16 to 19 June 2009.

COMEST is an advisory body and forum of reflection composed of 18 independent experts. The Commission is mandated to formulate ethical principles that could provide decision-makers with criteria other than purely economic.

During the session, COMEST discussed and adopted several recommendations based on the substantive work discussed in the course of the Ordinary Session. The objective is to support and enhance its presence of ethics in programmes relating, inter alia, to climate change, science policies and nanotechnologies, along with improved focus of specifically ethical programmes such as science ethics and environmental ethics teaching.

The recommendations are accessible through the links below:

In English: http://unesdoc.unesco.org/images/0018/001831/183140e.pdf

E-mails: comest@unesco.org

Website: http://www.unesco.org/shs/ethics

3. Report of the International Bioethics Committee of UNESCO on Human Cloning and International Governance

'Within the framework of its work programme for 2008-2009, the International Bioethics Committee of UNESCO (IBC) has focused on the issue of human cloning and international governance with the aim of exploring whether

there is any scientific, social or political change that would justify a new initiative at the international level on this area.

After two years of intensive work, despite the exceptional situation caused by the A(H1N1) influenza epidemic in Mexico City and the consequent postponement of its sixteenth (ordinary) session, IBC considered appropriate to let the Director-General have its conclusions on this issue and, therefore, finalized its Report on Human Cloning and International Governance and transmitted it to the Director-General of UNESCO on 9 June 2009.

The **Report of IBC on Human Cloning and International Governance** (Ref. SHS/EST/CIB-16/09/CONF.503/2 Rev.) is available in English and French; additional copies can be obtained from the Division of Ethics of Science and Technology, Bioethics Section (ibc@unesco.org) and is also available on-line (www.unesco.org/shs/bioethics).

In this Report, IBC is of the position that although it may be premature for the international community to engage now in the elaboration of a new binding normative instrument aiming at harmonizing both practices and principles in this area, the issues surrounding the international governance of human cloning cannot be ignored and a focused international dialogue is crucially needed. UNESCO, with its ethical mandate that remains unique within the United Nations system and its normative achievements in the field of bioethics, is in a privileged position to continue this reflection.

While the Report does not claim to be prescriptive, it could constitute a veritable resource for Member States, organizations and individuals dealing with the issue of human cloning.'

http://portal.unesco.org/shs/en/files/12828/12446291141IBC_Report_Human_Cloning_en.pdf/IBC%2BReport%2BHuman%2BCloning_en.pdf

4. News from SCi Dev

'China issues another crackdown on scientific misconduct

China's Ministry of Education has stipulated seven acts of academic misconduct and how they will be punished in an attempt to combat scientific misconduct in the country.

But critics doubt they can solve the long-standing issue of fraud and misconduct in Chinese academia.

The circular, issued this month (19 March) says that plagiarism, falsifying data and references, fabricating CVs and changing others' academic

achievements or signing their names without permission are scientific misconduct.

It is the latest effort to tackle the problem. In 2006 the Ministry of Science and Technology created a set of rules to monitor state-funded research projects (see China sets up rules to combat scientific misconduct) in response to six high-profile cases of scientific misconduct that year.

The new measures are aimed at misconduct in higher education institutions, following a recent scandal involving Zhejiang University in Hangzhou, where associate professor He Haibo and dean of pharmaceutical science Li Lianda lost their jobs over He's alleged copying of data.

Punishment for anyone in breach of the new rules could involve warnings, dismissal or legal charges. Their research programmes could also be suspended or terminated, they could lose their funding, or have awards and honours revoked.

The notice also ordered universities to train teachers and students in good academic conduct.

"These measures are intended to build up a long-term prevention mechanism to keep the academic field 'clean'," said Xu Mei, spokeswoman with the ministry.

But critics say the circular only "scratches the surface of a problem".

Hou Xinyi, a law professor from Tianjin-based Nankai University, says it is the government-controlled grant and award system that has spawned misconduct among Chinese academia.

"In China, the government controls almost all the funding resources, which are usually available for a limited selection of projects," says Hou.

He adds that because it is much easier for people in higher positions to win funding, researchers are faced with the pressures of socializing and gaining contacts and finding the time to publish as many papers in high impact journals as possible the most important criterion the government rely on to assess eligibility for project funding.

"It is understandable and necessary for the government to have funding control of some major projects essential to the country's safety and development," says Hou. "But as for that of others, they'd better leave it to academia to encourage true scientific excellence." ’

5. Open Access

From *Open Access News*

'More on student support for OA

Nick Shockey, Students join access debate, *Research Information*, June 25, 2009.

... A group of six national and local American student associations, representing both graduates and undergraduates, have come together to issue the Student Statement on the Right to Research. This statement calls on researchers, universities, and governments to take relevant steps to increase access to the results of research.

In the past, discourse on scholarly publication and open access (OA) has largely been between academics, librarians, and publishers. This resolution marks student's entry into the discussion. It reflects the large impact that limited access to research can have on students of all disciplines. ...

The new generation of scholars has grown up using the internet and having access to whatever information they need whenever they need it. Not having the same kind of unfettered access to information that is critical for their professional development is especially frustrating. ...

The statement has resonated with students in the USA but, while the current signatories are American, the resolution is not exclusive in its focus. It has also generated interest from students in Canada and across Europe and we look forward to reaching out to international student organizations in the near future. ...

As we move forward, we hope to use this statement as a rallying point for students to get engaged with the OA movement and as a solid foundation on which to build a rich student voice on OA. ...'

From *Open Access News*

'CISTI launches gateway to datasets, resources on data management

National Research Council Canada Institute for Scientific and Technical Information, NRC-CISTI launches gateway to scientific data, press release, May 14, 2009. (Thanks to Fabrizio Tinti.)

Scientific data generated during the research process can be an important resource for researchers, but only if it is accessible and usable. Thanks to a new

initiative of the NRC Canada Institute for Scientific and Technical Information (NRC-CISTI) researchers now have a central gateway for easier access to Canadian scientific, technical and medical (STM) data sets and other important data repositories.

The Gateway to Scientific Data will help ensure that the valuable data generated by Canadian researchers is more easily accessible so that it can be re-used for other research endeavours. With the ability to access and use data from a multitude of sources, researchers will be better positioned to turn research into discoveries and innovations. ...

Along with links to data sets, the new Gateway provides links to selected policies and best practices guiding data management and curation activities in Canada. It also includes links to selected journals and upcoming conferences and meetings.

The Gateway to Scientific Data is part of NRC-CISTI's contribution to a broader national initiative undertaken by the Research Data Strategy (RDS) Working Group to address the challenges and issues surrounding the access and preservation of data arising from Canadian research. ...'

Major new report on the economic implications of OA

'John Houghton and eight co-authors, Economic implications of alternative scholarly publishing models: Exploring the costs and benefits, January 2009. A major (256 pp.) report to JISC.

From the press release:

...The research and findings reveal that core scholarly publishing system activities cost the UK higher education sector around £5 billion in 2007. Using the different models, the report shows, what the estimated cost would have been:

- £230 million to publish using the subscription model,
- £150 million to publish under the open access model and
- £110 million to publish with the self-archiving with peer review services plus some £20 million in operating costs if using the different models.

When considering costs per journal article, Houghton et al. believe that the UK higher education sector could have saved around £80 million a year by shifting from toll access to open access publishing. They also claim that £115 million could be saved by moving from toll access to open access self-archiving.

In addition to that, the financial return to UK plc from greater accessibility to research might result in an additional £172 million per annum worth of benefits from government and higher education sector research alone.

JISC's Chair Professor Sir Tim O'Shea said, "The argument for moving from more traditional subscription or toll-based publishing to a model that allows for greater accessibility and makes full use of the advances in technology cannot be ignored. This report shows there are significant savings to be made and benefits to be had.

"JISC will work with publishers, authors and the science community to identify and help to remove the barriers to moving to these more cost-effective models," he added....

From the summary on the landing page:

...Scholarly publishing...is central to the efficiency of research and to the dissemination of research findings and diffusion of scientific and technical knowledge. But, advances in information and communication technologies are disrupting traditional models of scholarly publishing, radically changing our capacity to reproduce, distribute, control, and publish information. *The key question is whether there are new opportunities and new models for scholarly publishing that would better serve researchers and better communicate and disseminate research findings* (OECD 2005, p14).

Debate on the economics of scholarly publishing and alternative publishing models has focused almost entirely on costs. And yet, from an economic perspective, the aim is to have the most cost-effective system, not (necessarily) the cheapest, and however much one studies costs one cannot know which is the most cost-effective system until one examines both costs and benefits. Hence, *the aim of this project was to examine the costs and benefits of three alternative models for scholarly publishing (i.e. subscription publishing, open access publishing and self-archiving)*. In so doing, it seeks to inform policy discussion and help stakeholders understand the institutional, budgetary and wider economic implications.

The project involved two major phases:

- Phase I: Identification of costs and benefits [WINDOWS-1252?]– sought to describe the three models of scholarly publishing, identify all the dimensions of cost and benefit for each of the models, and examine which of the main players in the scholarly communication system would be affected and how they would be affected; and
- Phase II: Quantification of costs and benefits [WINDOWS-1252?]– sought, where possible, to quantify the costs and benefits identified; identify and where possible quantify the cost and benefit implications for each of the main players in the scholarly communication system; and, where possible, compare the costs and benefits of the three models....

From the section on comparing costs and benefits (pp. 211f) in the body of the report:

As noted, it is not possible to compare toll with open access publishing directly at the national level as they perform very different roles: toll access publishing seeks to provide UK subscribers with access to worldwide research (to the limits of affordability), whereas open access seeks to provide worldwide access to UK research. Therefore, we approach the question from both sides....

Because of the lag between research expenditure and the realization of economic and social returns to that research, the impact on returns to R&D is lagged by 10 years....This has the effect that over a transitional period of 20 years we are comparing 20 years of costs with 10 years of benefits....

[*Gold OA*:] We estimate that an all author/producer side funded OA publishing system for all journal articles produced in the UK would have cost around £170 million nationally in 2007, of which around £150 million would have related to higher education outputs– approximately 0.74% of GERD and 2.43% of HERD, respectively....

Ignoring potential cost savings and given the assumptions outlined above (including inflating costs at the higher 5% per annum), we estimate that over 20 years:

- The cost of OA publishing for higher education would be around £1.8 billion in Net Present Value, whereas the estimated impact on returns to Higher Education R&D Economic implications of alternative scholarly publishing models 214 (HERD) would be around £615 million, a benefit/cost ratio of 0.3 (i.e. the benefits would be less than the costs); and
- The cost of OA publishing nationally would be around £2 billion in Net Present Value, whereas the estimated impact on returns to UK Gross Expenditure on R&D (GERD) would be around £2.4 billion, a benefit/cost ratio of almost 1.1 (i.e. the benefits would be marginally greater than the costs) (Table 6.1)....

[*Green OA*:] We estimate that a system of OA (publications) repositories for journal articles with all outputs posted once, would have cost the UK around £23 million per annum nationally in 2007, of which £18

million per annum would have related to higher education. Ignoring potential cost savings and given the assumptions outlined above, we estimate that over 20 years:

- The cost of OA self-archiving for higher education would be around £189 million in Net Present Value, whereas the estimated impact on returns to Higher Education R&D (HERD) would be around £615 million, a benefit/cost ratio of 3.2; and
- The cost of OA self-archiving nationally would be around £237 million in Net Present Value, whereas the estimated impact on returns to UK Gross Expenditure on R&D (GERD) would be around £2.4 billion, a benefit/cost ratio of 9.9....

These comparisons suggest that the additional returns from enhanced accessibility and efficiency alone would be sufficient to cover the costs of OA self-archiving in parallel with subscription publishing (i.e. 'Green OA' self-archiving *without* subscription cancellations), independent of the activity cost savings noted above.

Indicatively, putting the notional impacts of enhanced access into year one to simulate a post-transition 'steady-state' alternative OA self-archiving system, returns a benefit/cost ratio of 36 for higher education and 110 nationally. This suggests that the benefits of an OA self-archiving system with overlay services would substantially outweigh the costs....

From the conclusions and recommendations (pp. 231f):

...There are...major differences between impacts [of OA] during a transitional period and those in a hypothetical alternative 'steady-state' system....We took the view that it was more realistic and of more immediate concern to model the transition, but it must be emphasized that a transitional model returns significantly lower benefit/cost ratios than would a hypothetical alternative 'steady-state' model. Hence, while the findings presented should be interpreted with caution, the assumptions and modeling are very conservative....

[Different models for scholarly publishing can make a material difference to the returns realized, as well as the costs faced....

[While net benefits may be lower during a transitional period they are likely to be positive for both OA publishing and self-archiving alternatives (i.e. Gold OA) and for parallel subscription publishing and self-archiving (i.e. Green OA). This suggests that there are gains to be realized from moving towards more open access publishing models and that, despite the lag between the costs and the realization of benefits, the transition would probably be affordable within current system-wide budgetary allocations....

Recommendations...

Overcoming the barriers...

- Ensuring that research evaluation is not a barrier to innovation (e.g. by developing and using metrics that support innovation in scholarly publishing, rather than relying on traditional evaluation metrics that reinforce and reward traditional publishing models and behaviours);
- Ensuring that there is funding for author or producer side fees (e.g. encouraging all research funders to make explicit provision for publication charges, and encouraging higher education and research institutions to establish funds to support publishing fees);
- Encouraging and funding the further development of institutional and/or subject repositories; and
- Supporting advocacy initiatives to inform and educate funders, researchers and research managers about the potential impacts of alternative publishing models....

Realizing the benefits...

Our analysis suggests that open access self-archiving, either in parallel with subscription publishing or with overlay services, may be very cost-effective, although more information is required on repository costs and the potential benefits of greater integration of publications with other forms of research output, their integration into learning materials, and the curation and Exploring the costs and benefits sharing of research

data (Box E-I). Hence, there is scope to focus greater attention on the development of repositories. This might include:

- Encouraging and supporting the development of institutional and/or subject repositories;
- Encouraging greater focus on the operational effectiveness of repositories (e.g. enhancing metadata standards and quality, effective federation, enhanced discoverability and searchability, supporting the development and use of metrics and reporting suitable for research evaluation, etc.); and
- Encouraging greater sharing of information and experiences to enable stakeholders to better understand the costs and benefits involved and build more effective 'business cases' for repositories.

Our analysis also suggests that there may be considerable benefits available from a shift to open access scholarly book publishing....'

6. EL SALVADOR ESTABLISHES NATIONAL BIOETHICS COMMISSION

'The Republic of El Salvador has established a National Bioethics Commission. The Commission has been created by decree of the Minister of Public Health and Social Assistance. The mandate of the Commission is to assist in the elaboration of legal frameworks and national policies and to promote the protection and respect of life, the environment, and human dignity. Amongst its aims are the promotion of public debate and the provision of specific knowledge for debate and dialogue which may potentially be used in the decision making process in the field of health care.

The Commission of El Salvador has 26 members. Doctor Fernando Conde, Member of the Bioethics Association of El Salvador has been appointed as the Chair of the Commission. Members are representing different professional bodies in areas such as public health, research, agriculture, environment and justice.

UNESCO will sign a Memorandum of Understanding with the National Bioethics Commission of El Salvador to assure cooperation for the next three years. A training course in working methods will be provided to the members of the Commission in 2010 by UNESCO experts. Documentation packages of relevant bioethics materials will be provided and a second training, specifically focused on bioethics will be organized in 2011.

The establishment of National Bioethics Commissions and Committees follows the recommendations of the *Universal Declaration on Bioethics and Human Rights*, adopted by UNESCO in 2005. The mandate and mission of a National Bioethics Commission and/or Committee is generally focused on policy advice, public debate and ethics education, and therefore wider than the scope of a research ethics committee.

The Republic of El Salvador is the seventh country to join the UNESCO project on Assisting Bioethics Committees (ABC). The newly formed National Bioethics Committees of Gabon, Ghana, Guinea, Jamaica and Togo signed an agreement of cooperation with UNESCO earlier this year and participated in the first training course. An agreement with the new Committee in Madagascar will be signed next year.'

More information about the National Bioethics Commission of El Salvador can be obtained from the UNESCO Assisting Bioethics Committees Website (http://www.unesco.org/shs/ethics/abc).

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7. Case of data manipulation by physicist Jan Hendrick Schön

The scientific misconduct of Jan Hendrick Schön, former post doc of New Jersey's Bell laboratories came in light in 2002, when his "path breaking" results published in highly respected journals could not be replicated by other scientists. Found guilty by the management at Bell Labs, Schön was fired and since gone into oblivion.

A journalist Eugenie Samuel Reich has written a book **"Plastic Fantastic: How the biggest Fraud in Physics Shook the Scientific World"** in 2009, on Schön's deed, after painstaking research and interviewing more than hundred people who interacted with Schön. Schön claimed to have discovered superconductivity in a plastic material and published in esteemed journals like Science and Nature. Review of the book by Martin Blue, editor in chief emeritus at American Physical Society, was published in Nature (Vol.459, 5 June, 2009, p645). The author Eugenie Samuel Reich, however, disagrees on Blume's views on the role of whistleblowers (Nature, Vol.460, 20 Aug, 2009, p949). She argued that whistleblowers remain at risk when recognized channels in science practice and publishing fails to correct the fraud.

National

1. Indian researcher charges journal bias - March 31, 2009

"Posted on behalf of K.S. Jayaraman

A leading Indian biotechnologist has demanded that a review article in *Annals of Botany* be retracted because his work was not cited in it. The journals chief editor, Pat Heslop-Harrison of the University of Leicester, has denied the charge and rejects the allegation that the journal suppressed novel ideas coming from scientists in developing countries.

Vetury Sitaramam, former head of biotechnology at the University of Pune, has nevertheless filed a formal complaint with the Committee on Publication Ethics (COPE) in Guildford, UK. The Indian watchdog agency, Society for Scientific Values, says it will voice its concern if the journal refuses to publish Sitaramams rebuttal without giving a good reason.

The article in question is a review of research on the role of mitochondrial respiration in drought and crop yield. In his complaint to COPE, Sitaramam alleges that his papers were left out because they challenged the need for genetic modification to create drought-tolerant plants. He also says the issue at stake is more than a simple argument over citation. The whole point is why are alternate views to molecular breeding, especially from developing country scientists, becoming difficult to publish? He asks. This is an example of a growing trend of West marginalizing novel work from the East, says

Nandula Raghuram of GGS Indraprastha University in New Delhi and managing editor of the journal *Physiology and Molecular Biology of Plants*.

Heslop-Harrison refutes any allegation that *Annals of Botany* suppresses ideas, and in particular does not publish ideas coming from developing country scientists. There is no evidence whatsoever for this damaging statement, he told *Nature*. Indeed I expect we publish more important science from developing countries than many other journals."

2. DU teacher sacked, another suspended Source: The Hindu (http://www.hinduonnet.com/2009/06/28/stories/2009062857080300.htm) New Delhi & nbsp;

"The Executive Council of Delhi University has recommended disciplinary action against two teachers, including a termination and suspension, on different counts. Meeting here over the weekend, the Council decided to suspend Professor Ajay Tiwari of the Hindi Department who had been accused of sexual harassment by a student.

The EC has decided that he will be served a show-cause notice on why he should not be terminated for such charges against him. He will be placed under suspension with immediate effect. The EC thought it was unethical on the part of a professor to indulge in such activities, said an EC member, Som Dutta Sharma.

The services of Rohtash Singh, a teacher on probation in the Chemistry Department, have been terminated as he did not take any classes after joining and kept going on leave without informing the authorities. The EC has also decided to acquit B. K. Das, a Maths professor who was earlier denied headship of his Department on the basis of some allegations of plagiarism. However, a committee looking into these charges submitted its report stating that he was not at fault, informed another EC member, Rajib Ray."

3. Seminar/ courses in Ethics

- President, SSV, addressed a Seminar on Ethics sponsored by Orissa Govt. It was chaired by the Minister, Higher Education and was very well attended by senior academics
- A seminar in Patna was organized on 22nd August on 'Ethics in Science & Technology' in Patna Women's college. The seminar was presided by Prof. K.L.Chopra, President SSV. SSV President and Secretary, Dr. R.K.Kotnala delivered talks in the seminar.
- BHU has decided to offer a one credit course on Ethics. SSV will have a role in initiating the process.
- Acropolis Institute of Technology & Research, Indore is a leading Institute of Madhya Pradesh at Indore, promoted by TEACH FOR INDIA EDUCATION & RESEARCH SAMITI headed by Shri Ashok

Sojatia, retired engineering chief, irrigation department M.P., since July 2005. There are 5 undergraduate courses leading to B.E. degree in Computer Science & Engg., Information Technology, Electronics & Comm. Engg., App. Electronics & Instrumentation Engg., Mechanical Engineering and 2 post graduate courses M.B.A. & M.C.A. Presently they are forming Ethical Policies for the Institute. Dr. P.B.Sharma, Ex. Vice Chancellor of Rajiv Gandhi Proudyogiki Vishwavidyalay, Bhopal and Director, Delhi College of Engineering, Delhi guided them for getting valuable suggestions of President, SSV in this respect. SSV is requested to guide in framing the Ethical Policies of the Institute in the wider interest of the education fraternity.

The university is in the process of finalizing the contents for the compulsory audit course on Human Values and Professional Ethics for all branches of study in UPTU with effect from the coming session.

The BOS conveners meeting and Academic council will be soon approving the plan. This will be 2-0-2 course and without clearing it they would not get the degree and minimum pass percentage is 50 percent.

UPTU will introduce "Human values and Professional Ethics" in their engineering courses starting July 2009.

Compiled by
Santa Chawla

A Memoir

Role of Dr. A. R. Verma in Formation and Working of SSV

P. N. Tiwari
Founder Secretary and Ex-Vice President, SSV

Dr. Ajit Ram Verma, Ex- Director, National Physical Laboratory, New Delhi and one of the main founders of Society for Scientific Values passed away on March 4, 2009. An obituary describing his eminence in science and management has been published in June, 10, 2009 issue of Current Science. The obituary has ended stating that spiritually he was strongly influenced by Bhagavad-Gita, Upanishads and Sant Kabir. That is quite true. In fact Dr Verma acted like Krishna of Bhagavad-Gita in the formation and working of SSV and its precursor BSF. Perhaps many persons even closely associated with SSV at present do not know it. I have tried to cover that aspect of Dr. Verma in detail in this memoir.

The SSV was formed in 1984 and registered as Society in 1986 after a good deal of deliberations among many top scientists of the country, but its precursor was formed within a week in 1981 by a coincidence in the office of Dr. Verma at NPL. I had a significant role in it. At that time I was working in the adjoining Nuclear Research Laboratory (NRL) that was established in early 1970s in IARI with big UNDP grant given through International Atomic Energy (IAEA). I had joined it as Senior Physicist at its inception on the advice of Dr. Verma. Within two years I developed a new technique for determining oil content in oilseeds in few seconds without causing any damage to seeds using low field pulsed NMR which is of great value in selecting genetically superior seeds of high oil content for developing new varieties of oilseeds crops for high oil yield.

Around the same time some scientists of IARI alleged that Director of the Institute has made major false scientific claim. Unfortunately a senior scientist of IARI committed suicide making several such allegations, some of which were found to be true by high level committee appointed by the Government. I myself found some senior scientists around me in NRL making false claims. All this made me decide in 1974 to act against false claims in science irrespective of the position of the person making such claim. I told it to Dr Verma. He was Director NPL at that time. I knew him closely for long as a person of high integrity in every walk of life. He supported my decision with caution and concern of a well wisher and gave timely advice in the struggle in which I had to face the top managers of ICAR, DAE and IAEA against the bid to malign and discredit my own main research. That is not unusual in such cases. But it is also not unusual that help comes from unexpected quarters when someone works for higher cause. My struggle ended in success with such unusual help in 1979 revealing the kind of unscientific attitude of many top managers of science in the country. My personal experience was eager for expression at wider level for greater good.

A coincidence in the office of Dr. Verma, created partly by him, provided the opportunity for it in 1981.Being located near NPL; I often used to go to Dr. Verma for advice in my struggle. His PA knew it and used to readily give time for it. One day, in the first week of April, 1981 I phoned him saying that I want to come to meet Dr. Verma. He said that an important person is sitting with Dr. Verma. But you come. I reached within 10 minutes. The PA directed me to Dr. Verma's room by his hand motion as soon as I opened the door of his room. That was unusual because earlier I, like others used to wait in PA's room when some important person was in Dr. Verma's room. It seemed that the PA had informed Dr. Verma about my coming and he had asked him to send me to him without waiting. I went to Dr. Verma's room and saw an elderly man of very good personality wearing dress similar to Jawaharlal Nehru sitting there. Dr. Verma introduced me to him and him to me as Prof. K. N. Koul Founder Director, National Botanical Institute, Lucknow and Ex Vice-chancellor, Kanpur University of Agriculture and Technology. Dr. Verma told him about the new technique developed by me for determination of oil content in oilseeds in few seconds by NMR at NRL, IARI. Prof Koul was pleased to know it and explained to Dr. Verma how such a technique will revolutionize the oilseed breeding work in the country. Prof Koul told me that he would like to see this work. I welcomed it and invited him to my laboratory for it. When I came out of the room, the PA told me that Prof, Koul is maternal uncle of Indira Gandhi, the then Prime Minister of India and husband of the them Union Minister of Education.

Prof. Koul came to my laboratory the next day forenoon. I showed him the working of the new technique and some other related work that we were doing at that time. He praised every work a lot. All that took about an hour. After that I asked him if he would like to sit for a while. He said yes. I took him to my sitting room across the corridor. Just after entering the room he started praising my work in superlative terms while we were still standing across the table in my sitting room facing each other. At that stage I told him that there are many scientists in the country who are better than me. They are not able to do good work because of lack of good environment for research in the country. That was the turning point of our meeting. Prof. Koul looked at me with great surprise. I said sir; I am saying this with a purpose. I know that you are the maternal uncle of Smt. Indra Gandhi, Prime Minister of India. Please tell her to improve the environment of research in the country. At that point he took his sit opposite me and said that she can't do it. No Prime Minister can do it. He explained the reason by drawing three pyramids on a paper representing hierarchy in political, bureaucratic and scientific communities. He said that it is not possible for any Prime Minister to act on the advice of each and every person of any community. The Prime Minister acts on the advice of a few persons on the top. He said that in our country there is no scientific community like in advanced countries such as UK where the Prime Minister is almost bound to act on the advice of the President of the Royal Society. I said, Indian National Science Academy (INSA) is a similar body here. At that time Dr. MGK Menon was President, INSA as well

as Secretary, Department of Science and Technology, a part of bureaucracy. Prof. Koul pointed this out and said in our country scientific community has merged with bureaucratic community. Many scientists holding top positions in scientific institutions in our country have become bureaucrats; they can't improve the environment of research. In the next sentence Prof Koul said, you take the lead in developing healthy scientific community in the country. I told him that though, I would very much like to do it but neither have I held very high position nor I am very widely known nor have resources for it. How can I do it? He said I will help you, and advised me to call a meeting of some scientists at my residence for this purpose to which he would come.

Next day I went to Dr. Verma and apprised him about the visit of Prof Koul to my laboratory and the subsequent discussion between him and me, and sought his advice about holding the meeting of some scientists at my residence as suggested by Prof Koul. Dr. Verma told me to implement the suggestion of Prof Koul whole heartedly. It was not difficult for me to organize such a meeting at my residence as I had been talking about this matter individually as well collectively with many scientists for the past several years. A meeting of about fifteen middle level good scientists of IARI, NPL, NPBGR and IASRI that are located in the same area was held on 7th April, 1981 at 29/12 East Patel Nagar, New Delhi that was my residence at that time. The meeting which started at 5.30 pm went on till 9.30 pm. Prof. Koul was present all along. The emphasis in the meeting was not so much on narrating different unethical practices in scientific research, publication, research grants, scientific awards and promotions but it was very much on how to correct it and create proper environment in which science can take deep root in our country. In the end it was decided to form an informal organization to start with, for working collectively for this purpose. The organization was named as Bharat Science Foundation (BSF). Prof Koul was made its President and I, its Secretary.

After a day or two I met Dr. Verma and told him about the proceedings of the meeting at my residence especially the formation of BSF for working collectively to create proper environment for doing good research in the country. He was pleased to know it, and provided right guidance to its working by attending most of its meetings. It's very first meeting that was attended by about 35 scientists from many scientific institutions of Delhi along with a few editors of some scientific magazines, led to the public exposure of how a high value scientific award was recently given to a wrong person. Because of this exposure that particular award was given to the right person next year. The Foundation organized several meetings and a mini seminar aimed at creating healthy climate for research in the country. In that seminar the author presented a paper titled "Creating Healthy Environment for Scientific Research" which has been reproduced in SSV, N&V, Vol.4.No.1, 2006. The proceedings of the seminar though not published was quite effective, like the paper referred above in focusing at the problems that are coming in the way of doing good science in the country. Most of the meetings and the seminar were held in the conference room

of Ministry of Education. This facility was readily made available because Prof. Koul.

Prof. Koul passed away in early 1983. Dr Verma was requested to be the president. He suggested the name of Dr. A.S. Paintal, a highly reputed scientist known for very high integrity and outspokenness in scientific matters. However, Dr. Paintal, up to that time, was neither associated with the BSF nor knew anything about it. Dr. Verma told us that some of you should go to him and tell him the aims and objects of the BSF and request him to be its President. Five of us met Dr. Paintal in his laboratory and requested him to be the president. The meeting that went on for more than one hour was very unusual. Dr. Paintal spoke very little; we had to do most of the talking. He took almost a year to accept our request in early 1984. We were glad and did not mind the delay because no man of high repute will agree to such a request of some unknown persons without knowing them fully. An account of that meeting has been published in SSV, N&V, Vol.3, No.1, 2005.

The first meeting of BSF under the chairmanship of Dr. Paintal was held at the Indian National Science Academy (INSA), New Delhi on 20th March 1984. Dr.Verma was present as guide. The activities of the BSF were presented in it. In the second meeting held on 7th April, 1984, a suggestion was made to rename the BSF as Society for Scientific Values because that is what the Foundation was doing, promoting scientific values at that time. The proposal was approved in the last meeting of BSF held on 1st May, 1984. A committee consisting of Dr Verma, Dr P.N. Tandon and myself was constituted to prepare a write up about the need of the formation of SSV.

The first meeting in the name of SSV was held on 14th June, 1984 at INSA under the chairmanship of Dr. Paintal. The write up prepared by the committee was approved with some modifications. It was decided to send it to all the fellows of Indian National Science Academy, Indian Academy of Sciences, National Academy of Sciences and some other well established scientists with a covering letter of Dr. Paintal seeking their opinion about the formation of the Society. Many of them responded strongly endorsing the need for the formation of such a society. A committee consisting of Dr Paintal, Dr Verma and me was formed to nominate the Interim Executive Committee of SSV. Dr.Verma was Vice-President of this as well as the first formal Executive committee of SSV that was registered as society in 1986.

Dr. Verma was very polite in dealing with seniors and juniors alike. But he was very firm about the necessity of strictly adhering to basic spiritual values for doing genuine science. He has given the reason for it in the article “Scientific Research and Spiritual Values’ by him and L.S. Kothari published in SSV, N&V, Vol.7 No.2, April-2001. The article begins by stating that “Science deals with the external world, with space and time, matter and energy. Ethics and spirituality deals with internal world, with ‘self’ or with mind. On the first glance there

appears to be no apparent connection between the two. However on deeper thought we find that the rapid progress of science compared to other human activity is essentially due to the fact that the scientific research is guided totally by ethical and spiritual values".

"In science one relies on truth, whole truth and nothing but truth. Some basic qualities essential for any one pursuing science are truthfulness, honesty, sincerity, transparency and cooperation, which are all spiritual values. All these qualities essentially follow from truthfulness". As Gandhi Ji said "Truth is God".

"Science is the only human activity which is truly cooperative at the international level, even between the countries, which have been enemies for centuries. This is because of its total reliance on truth, the corner stone of ethics and spirituality."

"If we look around, we find that science progresses only in those countries where the basic principles of ethics and spirituality are strictly followed. It is common knowledge that the level of science in our country since independence has gradually declined. To reverse the unfortunate trend, we need strong will-power and determined effort to instill spiritual values in our scientific efforts, specially truthfulness, transparency and objectivity. In this connection our Society for Scientific Values can play a vital role"

Dr. Verma, not only expressed his clear and certain views about the ethical and spiritual values that one has to have for doing genuine and good science but he also expressed his equally certain, frank and strong views about the kind of action that should be taken against a scientist who is found guilty of misconduct in research and publication. In his article titled "Pursuit of Science-Need for Some Code" published in the proceedings of the seminar on "Scientific Misconduct-Disciplinary Action" organized by SSV in 1995, he said that cooking of result is forgery, fraud and cheating; plagiarism and stealing other scientist's work is theft; false authorship is false claim of ownership; and tall claims amount to misleading people. He added that legal action under respective Indian Penal Code should be taken against the guilty scientist along with 'Departmental' and 'Social' action.

Dr. Verma not only acted as guide in the formation of SSV and its precursor BSF but he also very clearly stated the specific ethical and spiritual values that SSV should promote for doing genuine and good science in the country. He laid down the kind of legal, departmental and social action that should be taken against scientists who are found to violate these ethical and spiritual values. He acted truly as Krishna of Bhagavad-Gita in the formation and working of SSV. Those who came in his close contact will feel something invaluable missing for long time.

Decline in Higher Educational Institutions

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Article withdrawn.
Please see corrigendum in the contents page.

The Arsenic Story: Environmental Injustice

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Containment of environmental degradation is one of the biggest challenges of the present decade. However, the remedial measures very often lack transparency and professional ethics. Research scientists and academicians get many opportunities to correct the situation. As consultants and technical advisers they can recommend better methods. However, the track record is dismal. Take the example of investigation of the threat to Taj Mahal from the Mathura Refinery. It was observed that some experts "tended to exaggerate the adverse effect of the project, even to the extent of magnifying figures"[1].

More recently, Gaur[2] has expressed similar concern about the deficit in the quality of investigative procedures. He also identified the deficit in the quality of expertise in preparation of environmental assessment reports.

In an in-depth analysis, Thakkar[3] came to the conclusion that "most research institutions have singularly failed to even publicize their findings of a serious nature, leave aside the question of lobbying for policy changes".

Our responsibility to preserve the natural environment is an ethical requirement. The arguments for a human-centered or anthropocentric environmental ethics are particularly relevant in this context. As elaborated by Taylor[4],"future generations of people have as much right to a physically secure and healthy life as those of the present generation. Each of us is therefore under an obligation not to allow natural environment to deteriorate to such an extent that the survival and well-being of later human inhabitants of the Earth are jeopardized".

The conflict between developmental activities and preservation of natural habitats leads to *Environmental Injustice*[5]. When these activities spread beyond international boundaries, the relatively under-developed regions face disproportionate ecological damage. On many occasions, the government in power acts more as a promoter than as a regulator[3]. With the usual penchant for foreign aid and foreign experts, the environmental risks to the local population are ignored. The following account of arsenic contamination of groundwater in Bangladesh will serve to illustrate many of the points discussed above,

The rural population of Bangladesh traditionally obtained drinking water from rivers and ponds. This inevitably caused epidemics of cholera and other water-borne diseases. In an attempt to provide "safe" drinking water, the

government undertook a massive drive in early 1990's to utilize groundwater resources. Millions of tube-wells were sunk with financial aid from UNICEF and World Bank. However, this effort ultimately led to what has been called the biggest outbreak of mass poisoning in history[6]. What went wrong?

Within a short period after installation of the tube-wells, there were reports of arsenic-induced skin cancer from a large number of villages. A survey in 2002 showed that some 50 million people in Bangladesh were drinking water that contained arsenic much above the permissible limit prescribed by WHO. At this juncture, it was also discovered that water samples collected earlier had not been tested for arsenic. The usual blame game started in official circles. In desperation, environmental activists filed a case in the High Court of London on behalf of victims of arsenic poisoning. They maintained that the British Geological Survey (BGS) was guilty of negligence during their work in this area. In 2003, the court opined that the victims had a realistic prospect of success in claiming compensation which could run into millions of pounds.

The response of BGS and its parent organization the Natural Environment Research Council (NERC) was typical of powerful bureaucracy. It was stated that the hydro-geologic work initiated by BGS as early as in 1984, was originally for supplying irrigation water. Although villagers started drinking this water, BGS did not analyze arsenic because its presence was not expected. This explanation was questioned by many experts because there were publications in 1983 in which Prof. K. C. Saha of the School of Tropical Medicine, Kolkata had reported arsenic contamination of groundwater in West Bengal. Another argument presented in the court was that it was the responsibility of the local authorities to make sure that the water was safe to drink. Moreover, scientists could not be held responsible for the research they decided not to do[7]!

Therefore in 2004, the Court of Appeal in London overturned the ruling of the High Court and refused the claim against NERC concluding that the case was hopeless and was bound to fail. It is interesting to note that this assessment by the Court of Appeal was contrary to that made earlier by the High Court. The House of Lords finally dismissed the case in 2006. But the doubt remains whether all available scientific data and laboratory facilities were properly utilized. Could the scientists have done more to avoid this tragedy? It does appear strange that no one was found accountable for the suffering of millions of people.

Unfortunately, the story does not end with Bangladesh. Currently in India, high levels of arsenic have been reported in groundwater from wide areas both within and outside the Ganges delta region. Many conflicting hypotheses have been proposed to explain the source and mechanism of this contamination. Various techniques for removal of arsenic and disposal of the arsenic-containing sludge have been tried out. But a real solution to the problem is yet to be found. In the mean time, innocent villagers continue to drink water laced with a deadly poison. Is there no redressal for this environmental injustice?

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India Needs Legislation for Accessing Publicly Funded Research

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The Union Ministry of Science and Technology has introduced the Protection and Utilization of Public Funded Intellectual Property Bill, 2008 in Rajya Sabha. After the enactment of this bill, any recipient of government grants for the purpose of research and development shall seek patent protection of the intellectual property generated and commercialize the same within the stipulated time. This bill is being discussed by various intellectuals and agencies in India and abroad. I am not going to discuss about it in the paper but wish to discuss more about the access to the output published in peer-reviewed publications from publicly funded research.

The open access advocate from India, Prof. Subbiah Arunachalam (1998), said in a conference in Egypt that a researcher in the developing countries needs to achieve a lot more to win recognition than in the developed countries. This is true when we compare the working conditions and access to the latest technologies, methodologies in today's unequal world. The international or foreign scientific journals, which are vehicles of scholarly communications, are becoming too expensive to be subscribed by Indian academic institutions. There are 559 research institutions and universities (DSIR Directory, 2007) in which great amount of research and development (R&D) activity are taking place and all of them need access to the scientific developments of the world. However, this is not happening because, the institutional libraries are not able to afford for the procurement of foreign journals. On the other hand, in the country, there is no proper and faster mechanism to communicate between the research institutions and universities. This lack of communication would lead to the duplication of the work and may not get more deliberations on the R&D output. There is no doubt that the scholars are publishing their articles in peer-reviewed journals but they are not widely reaching to the other scholars in the same disciplines or various other disciplines though we all are aware that R&D tasks are better accomplished by multi disciplinary approach. Added to this, the promotion and recognition policy of the academic and the research institutions in India compels the scholars to publish in so called high impact journals which are closed and toll access journals. Instead of citation of the publication, the institutions are relaying on the impact factor which may not be the true representation of the recognition of the work. Any one has to pay about USD 10 to USD 40 per article to access the papers in high impact factor journals. These journals, apart from the cost, impose lots of copyright restrictions for using and sharing with peers resulting in negligible dissemination of the knowledge among peers and public. The most

popular impact factor analysis is done by Thomson Reuters Inc. However, in its master journal list, many of the Indian journals are not included as they are not fitting into their criteria of evaluation. To address this issue, National Academy of Agricultural Sciences (NAAS) had rated 1600 journals of India and abroad on 1 – 10 point scale. However, NAAS has rated 6 and above for the impact factor journals and below 6 were given to Indian journals which are not having any impact factor. The scholarly journals which are published by various scientific societies formed for advancing the interest of their discipline are not into the master journal list. A survey on scientific societies in agricultural sciences by Aneeja and Sridhar (2009) reported that only few societies have websites and all of them publish peer-reviewed journals as 'print only journals' and some of them are making them online but, as closed & toll access in association with commercial content publication and managers. The scholarly societies are not embracing the latest Internet and web technologies for the publication online and to cut shot the printing expenditure.

The NAAS has bought guidelines for the improvement in the management of the society and quality of the publications. The scholarly societies are not aware that when journals are electronic, they are easily accessed and shared with peers and everyone in the world on the Internet. The articles when enriched with the hypertext links for the references and other figures and table, will enhance the quality of the information. In one of the study by Lawrence (2001), it was shown that the articles which are freely available online are cited more frequently than those which are traditional print and closed access. The members on the executive council (EC) of scientific societies are not giving much attention to information technologies which may be due to lack of technology infrastructure for hosting and maintenance of the online publications. Many of the societies' EC members had expressed that they would like to go with print journals only as they have to distribute to the institutional subscribers and it costs the same if they print one or 1000 journals. They had also expressed that the authors would prefer to see their paper printed in a printed copy and own that printed copy with pride. This argument might not be true when we seek the authors' preference. Everyone wish to see that his/her paper is cited more. The members of the societies should understand that embracing the open source technologies and Internet would remove all the restrictions and barriers for the wide distribution of the journals and make the peer-reviewed literature immediately accessible, searchable, and reusable to anyone in the world which is what called as Open Access (OA).

"The scholarly literature which is digital, online, free of charge, and free of most copyright and licensing restrictions is known as Open Access" (Suber 2004).

The OA can be provided in two ways: By placing one's copy of each article in an Open Access Repository (OAR) which is regarded as Green OA or by publishing articles in Open Access Journals (Gold OA). Societies for the

present time may keep aside the question of how feasible to alter their journals' access policies. There is now a broad consensus that widespread open access to scientific publications is good for scientists and good for science (Doyle et al., 2004). Richard Stallman (2002) in his collections of essay says that when copyright impedes the progress of science, science must push copyright aside. The transition to electronic publishing from print will certainly reduce the gap between the developed countries and the developing countries. Now in most of the developing countries, there are efforts being done for the increase in the necessary infrastructure (computer terminals, networks, communication channels, bandwidth, etc.). This should give an opportunity for the world wide distribution of knowledge produced.

According to TRAI (2006) report, there are 153 Internet service providers (ISPs) in operation today in India, giving the broadband facility up to 4 mbps and there are free & open source software for the online journal publication and management. With an estimated forty-eight million users, the Internet community in India is the fifth largest in the world. The number of internet users worldwide is expected to touch 2.2 billion by 2013 and India is projected to have the third largest online population during the same time, (IGF report, 2008). An estimated 38 percent of all Internet users in India are “heavy users” and spend an average of 8.2 hours per week on the Internet (IAMAI Report, 2006). A number of journals now are receiving manuscripts by E-mail but it is sent to reviewers as hard copy by post. As a result, there is a considerable time lag between the submission and publication.

Under the Right to Information Act 2005, information including commercial confidence, trade secrets or intellectual property is exempted from the disclosure unless the competent authority is satisfied that larger public interest warrants the disclosure of such information. However, in the case of public funded research, the information already published could be made available for the public good. As said earlier, there are now many free & open resources available to make research results freely available online to the whole research community. The author pay model has been implemented by various other societies whose journals were printed only traditionally and subscription based and transformed themselves into online and open access journals. Adaptation of such model would bring back the eroded revenue if they transform into online and open access. The societies can generate funds from other activities and initiatives at their annual meetings. They should understand that the revenue is not solely dependent on subscription. However by making use of recent innovations in online journal production and dissemination, the publishing costs could be reduced dramatically. The Public Knowledge Project (PKP), Canada, had developed Free & Open Source Software, Open Journal System (OJS) which would increase the efficiency of electronic journal publication and management. The OJS software is free and has online support. There are societies formed such as Open Knowledge Society, for assisting the societies in transformation of

their traditional print journal into online open access journal. The OJS journal management and publishing system and Open Archives Harvester (OAH) metadata indexing system, the scholarly communications could be used for expanding and improving the access to research. There are currently about 1300 repositories around the world. The contents of all repositories are being indexed by Web search engines such as Google and Google Scholar and creating online Open Access databases of freely-available global research.

On the other hand, to make easy for sharing the copyright material legally, the Creative Commons (CC) provides free tools that let authors and scientists to easily mark their work with the freedoms they want it to carry and can use CC license to change their copyright terms from "All Rights Reserved" to "Some Rights Reserved". The Science Commons apply the philosophies and activities of Creative Commons in the realm of science. It aims to clear the legal and technical pathway for accelerating discovery worldwide with its open licenses for copyrighted works, building open source platforms for knowledge management and data visualization. Current publisher policies on self-archiving and copyright are detailed on the SHERPA project of United Kingdom, OAKList project of Australia and SCPJ of Japan. As per the ROMEO colour, the journals with archiving policy, 'Green' can archive pre-print and post-print or publisher's version/PDF, 'Blue' can archive post-print (i.e. final draft post-refereeing) or publisher's version/PDF, 'Yellow' can archive pre-print (i.e. pre-refereeing) and 'White' archiving not formally supported. A similar kind of database for the societies' copyright policies had to be developed in India with the assistance from National Informatics Centre (NIC).

The open access (OA) movement gained momentum with the Budapest Open Access Initiative (February 2002), Bethesda Statement on Open Access Publishing (June 2003), and Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (October 2003); these were the most central and influential milestones in the OA movement. The epicenter for the Open Access movement is Bangalore, India. The Indian Institute of Science and Indian Academy of Sciences Bangalore were in the forefront of OA movement in the country. In the country, researchers have generated extensive information. This information is to be of optimal use by all scientists working; all this data must be collated and made accessible. Therefore, a major focus should be to develop information management systems for providing the required data capture, storage query and access interfaces to meet the demands of scholars. For this, Data Portability project is working to reuse the said data across interoperable applications. We all know that the scientific innovation depends on finding, integrating, and re-using the products of previous research. Recent developments in Web technology particularly those related to the publication of data and metadata can very well be used to provide semantic enhancements to journal articles for 'lively' interactive access to content within the mainstream process of scholarly journal publishing. This semantic enhancement of scholarly

journal articles is being undertaken by leading publishers like PloS Computational Biology. Provision of live Digital Object Identifiers (DOI) and hyperlinks, semantic markup of textual terms, with links to relevant third-party information resources, interactive figures; a re-orderable reference list, a document summary containing a study summary, a tag cloud, and a citation analysis and with published downloadable spreadsheets containing data from within tables and figures can enrich the provenance information.

There is a hard notion that IPR had tried to block the further innovation and research and development. This is somewhat true and many researchers who are engaged in creation of new knowledge had to look at gaining access to research tools which are protected by patent rights and various other licensing terms. Falling in the line with Free Software Movement and GNU Manifesto/Philosophy, an open source movement in biology, called the Biological Innovation for an Open Society (BiOS), was initiated by molecular geneticist Dr. Richard Jefferson, founder and CEO of the CAMBIA in Canberra. Dr. Richard Jefferson has shared his discovery of enabling technology “GUS gene” (beta-glucuronidase gene), an indicator for gene expression, for the research and development in biomedical and agricultural biotechnology. BiOS provide biotechnology with its own free ‘operating system’: a public-domain toolkit and associated patents, aimed at freeing researchers worldwide to innovate without restriction, and without being forced into partnerships or unfavorable royalty agreements. These patented techniques in core toolkit are into a protected ‘commons’, protected by licenses and other contracts, as biotechnology researchers and agencies around the world contribute new ideas and refinements. The CAMBIA – BiOS' Protected Commons (PC) provides a secure platform where discussion concerning an invention or improvement can take place without the invalidation of future patent applications, or the misappropriation of information by third parties. By placing patented and patentable technology in a protected commons, patents can be exploited for enabling use of technology by others instead of preventing it. Under this, both patent owners and licensee users of the technology share improvements whether patented or not. Owners of improvements may patent them under confidential, non-public disclosure of improvements under the agreement in legal condition of maintaining the improvements accessible to all other licensees. Under BiOS agreements, technology is made available royalty-free for use in research or in creating products, by anyone in any country, based on a legally binding agreement. The Open Source Drug Discovery (OSDD) of CSIR is also under the Protected Commons.

All the journals of the Indian Academy of Sciences (IAS) and Indian National Science Academy (INSA) are open-access journals. Recently, Council of Scientific and Industrial Research (CSIR) nationally and International Crops Research Institute for Semi-Arid Tropics (ICRISAT), Consultative Group on International Agricultural Research (CGIAR) internationally, has adopted Open

Access Policy and this should lead the way in adopting a policy on Open Access by all the Publicly Funded Research Institutions (PFRIs) in India. In the special session on Open Access held during the 93rd Indian Science Congress at Hyderabad, proposed "Optimal National Open Access Policy" by which the authors of research papers resulting from PFRIs such as Department of Science and Technology, (DST), Council of Scientific and Industrial Research (CSIR), Department of Biotechnology (DBT), Indian Council of Agricultural Research (ICAR), Indian Council of Medical Research (ICMR) etc. shall make their results available for free by depositing into an institutional open access repository immediately upon acceptance for publication. This should be high on the agenda of leading institutions that are concerned with putting intellectual worth of the country on the world map. The second vehicle of achieving OA, Institutional Repositories (Green OA) is an important vehicle for the developing country like India through with the research institutions and universities can show case the R&D output to the world. However, the adoption of this green route OA in India is slow; out of the 1300 repositories of the world, only 33 are in India (OpenDOAR) There is a great need for the legislation in India on the terms of National Institute of Health (NIH) policy of USA without which, the order of making open access to the public funded research is slow to achieve. The Bayh-Dole Act of 1980 of United States of America (USA) gave inspiration to the government of India for the introduction of the “Protection and Utilization of Public Funded Intellectual Property Bill 2008” in the Rajya Sabha. Now with the recently introduced “Federal Research Public Access Act 2009” in USA should inspire the government for introduction of a similar kind of bill or incorporation of “Open Access” into the draft of Protection and Utilization of Public Funded Intellectual Property Bill, 2008 which will make mandatory open access to all the peer-reviewed publications that had emerged funded the projects funded by government/public grants in the Institutional Repositories of Public Funded Research Institutions in India. The Organization of Islamic Conference (OIC) had proposed for the creation of Islamic Citation Centre (ISC) to manage the science citation and to analyze the research performance with aim to improve the research performance and output (Sawahel, 2008). This would help science policymakers in assessing the return for research and development investment by measuring key research performance indicators such as number of publications and patents per researcher, as well as number of publications and patents relative to GDP and amount of money spent on R&D. The Ministry of Human Resources Development (MHRD) had already approved for the deposition of Ph.D. thesis in the open access repository and gave guidelines for the assessment of the researcher on the performance of research output.

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Ethics in Engineering Education

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*(**Editor's note**: Some excerpts reproduced, with the permission of Indian National Academy of Engineering (INAE), from a Chapter of the forthcoming Book entitled "Profiles of Engineering Education in India : Status, Concerns and Recommendations" by Professors Gautam Biswas, K.L. Chopra, C.S. Jha and D.V. Singh, being published by Narosa Publishers (2009) for INAE.*
The chapter, authored by Prof Chopra, addresses issues related to personal, academic, engineering education and professional ethics , ethical rights , nurturing of ethics, recommendations for addressing ethical concerns in academic institutions and code of ethical conduct as formulated by different professional and scientific bodies such as Institution of Engineers (India) and Indian Academy of Sciences.)

"History of the world civilizations shows that societies have risen to a higher level not through mechanical or technological efficiencies but by practicing sound moral and ethical values (Quoted from Gita & Management by Swami Bodhinanda)

Why Ethics for Engineers?

Paradigmatic shifts have taken place as a result of the industrial revolution leading to the evolution and definition of ethical values and codes of conduct in business, management, scientific, engineering and other professional activities in the industrialized western world. Such ethics have gradually been adopted as an integral part of teaching-learning process in schools of management all over the world **.**Engineers are expected to apply science and technology for progress and prosperity of society at large. Engineer interface with society in a multidimensional way, depending on their role as a teacher, professional worker or a manager. Consequently, it is paramount for him/her to imbibe professional ethics. It is equally important to make sure that professional education also imparts such ethics to the students aiming at knowledge-based professional careers.
Today, knowledge is the engine of growth and is the driving force behind rapidly changing, shifting and emerging paradigms in a globalised professional engineering environment. The key components of these paradigms are:

- Trade , markets and world trade organization (WTO) regime
- Knowledge based and innovation driven technologies and
- manufacturing
- Global and local competitiveness
- Concern for ecology, sustainability, green industry, green energy and green jobs

- Intellectual property rights (IPR) regime
- Outsourcing & off shoring
- Quality ,reliability and total quality management (TQM)
- New open, flat, virtual, cross cultural, and ethical management modes and styles

Nurturing of Ethical Values:

- "The growing concern over the erosion of essential values and an increasing cynicism in society has brought to focus the need for readjustments in the curriculum in order to make education a forceful tool for the cultivation of social and moral values".(National Policy on Education,1986).
  Despite this lofty declaration by educationists, very little has been done by any educational system in the country for nurturing ethical values among students of science and engineering. Business ethics are , of course, compulsory subjects in Schools of Management .A few academic institutions have recently set up Centres for Value Education which have designed courses for motivating interested students.
- Society for Scientific Values (SSV), a unique non-government Society, was registered by a number of prominent scientists and engineers of the country in 1987 to promote integrity, objectivity and ethical values in the pursuit of science and technology in India. SSV has held several national and institutional seminars for sensitizing and motivating students, faculty and R&D scientists on ethical issues. The Society has prepared a code of conduct for research scientists and also acts as a watchdog for unethical practices in the knowledge community of India.
- In sharp contrast to our indifferent attitude, exposing science and engineering students to ethical values is mandatory in all institutions in developed countries. It is generally recognized that ethics cannot be taught in a formal way but must be cultured and nurtured through experience, analysis, introspection, and sense of responsibility., sensitization. Therefore, suitable material for open discussion on such issues as problem solving, case studies, moral decision making dilemmas has been prepared by academics in various western countries. Modular courses, integrated with regular science & engineering courses, taught by reputed and experienced scientists/engineers are helping to nurture future Ethicists in many western countries.
- National Science Foundation, USA has prepared various motivational packages on ethics for integration with regular teaching-learning programmes for science and engineering students and which are recommended for delivery by prominent academics or professionals in an informal manner.

Promotion of Ethical Practices:

Both academic institutions and professional societies/institutes/academies have a responsibility for developing and promoting knowledge-based professional ethics through awareness and motivational workshops, incentives and disincentives. With a few exceptions, most academic institutions in India do not have any defined code of conduct except for an unwritten honour code for students and faculty.

Compliance of a code of conduct is just as important as the code itself. There is certainly a need for a regulatory mechanism to monitor and to ensure compliance of the code It is recognized that "no regulatory mechanism, however strong, can provide for the consequences of human greed, folly or corruption" (Tim Yeo). The reluctance of authorities to acknowledge the occurrence of proven cases of unethical practices and scientific misconduct even in prestigious academic institutions calls for a regulatory mechanism with some quasi-judicial powers.

Some professional bodies which are seriously involved in designing codes of conduct are:

- The Institution of Engineers (India) was created in 1920 to promote and advance the art, science and practice of engineering and technology in India. It prescribed a set of Professional Conduct Rules in 1944 which have been revised and published as 'Code of Ethics" given in Appendix. However, no serious effort has been made to popularize the code. Nor is it a requirement for professional engineers to commit to adherence to the code.
- An Engineering Council of India (ECI) has bee registered in 2002 to establish a confederation of engineering societies/associations. One of its objectives is to evolve codes of professional conduct and ethics for various engineering disciplines.
- It is noteworthy that Tamil Nadu is the only state in India which has published a code of conduct for civil engineering profession
- Department of Biotechnology (DBT) and Indian Council of Medical Research (ICMR) and ICHE have prepared Ethical Guidelines on some aspects of Biotech ,Biomedical ,and Social Science Research on human health
- Council of Scientific and Industrial Research (CSIR) has adopted the code of conduct of the Max Planck Society, Germany although it is not known to any CSIR laboratory
- A detailed code of ethics, primarily applicable to scientific values and academic research integrity issues, has been developed by the Indian Academy of Science (IAS), Bangalore and is reproduced in the Appendix II. The document lists ethical guidelines and procedures for research. It

also recommends a national regulatory authority for dealing with cases scientific misconduct

- A pro-active Office of Research Integrity for life sciences set up by President Clinton in USA is an example to follow. Presently, formal and informal exposure to S&T ethics is mandatory for all students in most western academic institutions.
- Science, engineering and technology based Professional Societies in the west have evolved detailed codes of conduct and, in some cases, have set up Boards of Ethical Review as regulatory bodies.
- Many professional societies in USA have individually published their own canons or codes of ethics. In the US, the code adopted by the Engineers' Council for Professional Development (ECPD) is the most widely accepted. Some of the fundamental principles of these codes are:
  The Engineer, to uphold and advance the honour and dignity of the engineering profession and in keeping with high standards of ethical conduct:
  1. Will be honest and impartial, and will serve with devotion his employer, his clients, and the public.
  2. Will strive to increase the competence and prestige of the engineering profession.
  3. Will use his knowledge and skill for the advancement of human welfare.
  There are more detailed statements under (a) Relations with the public, (b) Relations with employers and clients, and (c) Relations with engineers.
- A new umbrella organization has been formed in the U. S called the American Association of Engineering Societies (AAES) in 1980, which is seeking to establish the AAES Model Guide for Professional Conduct (AAES 1984) as a profession - wide code of ethics. The significance of the AAES with respect to social responsibility issues, however, lies in the relationship between the engineering profession and the public.
- The Federation of All European Academies (48)has advised the member Academies to set up National Committees for Scientific Integrity and to evolve a code of conduct
- The International Committee of Scientific Unions (ICSU) has set up a standing committee on responsibility and ethics in science and a very comprehensive report is available on its website. Further, ICSU has advised member academies to formulate country specific documents on Ethics in science and technology. In India, an inter-academy committee chaired by Prof. Menon is working on the job.
- UNESCO has evolved "Universal Declaration on the Human Genome and Human Rights". It has undertaken a variety of activities through its Division of Ethics of Science and Technology , International Bioethics Committee and the Division for mapping global Ethics Experiences
  A Global Ethics Observatory (GEOB) established on Dec15, 2006 has compiled three Data Banks on: Who's Who in Ethics; Ethics Institutions; Ethics Training Programmes and also a Division for mapping global Ethics Experiences. Further, UNESCO has set up two Ethics Chair

Professorships in Israel and Russia and supports international seminars on various aspects of ethics in S&T in collaboration with member countries

Recommendations:

1. Ethical values must be recognized as being central to globalised knowledge-based economies of nations. Therefore, culturing , nurturing and sensitizing of ethical values among the knowledge communities of students ,teachers and professionals must be accepted as an essential component of teaching-learning and sensitization process in all academic institutions and professional bodies
2. Knowledge of professional codes of ethics and importance of professional morality should be integrated into the professional education system so that these are cultivated as a part of professional orientation of our students
3. The privilege of the profession demands unconditional adherence to defined codes of practice and to its moral and ethical values. This can best be protected by carefully developing codes of ethics and conduct for the professionals. A professional engineer should be required to make a written commitment to adhere to such a code. The code should be binding on its members and any deviation from the defined path should be strictly punishable or else the "privilege to serve" will become a "privilege to exploit".
4. There is a dire need for a national, non-government, and quasi-judicial committee/ commission to provide a think tank and a watchdog to deal with cases of unethical professional misconduct by individuals or corporations of national importance.
5. All academic institutions must have in-house monitoring and regulatory mechanism for ethical values through suitable "ethics vigilance" or "knowledge integrity" committees.
6. There is already a demand by such organizations as WTO to evolve globally acceptable and enforceable codes of professional ethics, morality and code of conduct for professionals and corporations engaged in knowledge-based global engineering services, manufacturing and trade. Such a code needs to be certified by a suitable international standards organization (ISO)
7. Professional responsibility to adhere to ethical values must be supported by legal and moral rights, with suitable limitations and recognition by others of such rights.
8 All institutions need to provide an empowered mechanism for respecting and protecting the whistle blower who exposes misconduct or unethical practices in an organization. A whistle blower's act needs to be adopted nationally."

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Membership of the Society for Scientific Values

Scientists who wish to join the efforts of the Society to promote ethics (support right and oppose wrong) in scientific research, development and management and, who meet the following requirements are welcome to become the member of the society.

1. He/she should have allowed his name to apppear as an author in only those publications in which he/she was actively involved, in data collection, theoretical formulation, design and construction of apparatus, field trips, mathematical derivation and calculations, statistical analysis and interpretation of results, as distinct from administrative support and providing funds or facilities.

2. He/she should have never plagiarized or made false claims or indulged in or supported and encouraged any kind of unethical activity in science.

3. He/she should agree to withdraw from the Society if he/she ceases to adhere to the requirements 1 and 2 above.

A scientist who wishes to become member should send his brief biodata to the President or Secretary of the Society. A member of the Society may also send biodata of such scientist for the membership. Non-scientists who have promoted ethics in their profession can also become member of the Society.