Society for Scientific Values

Ethics in Scientific Research Development and Administration

News and Views

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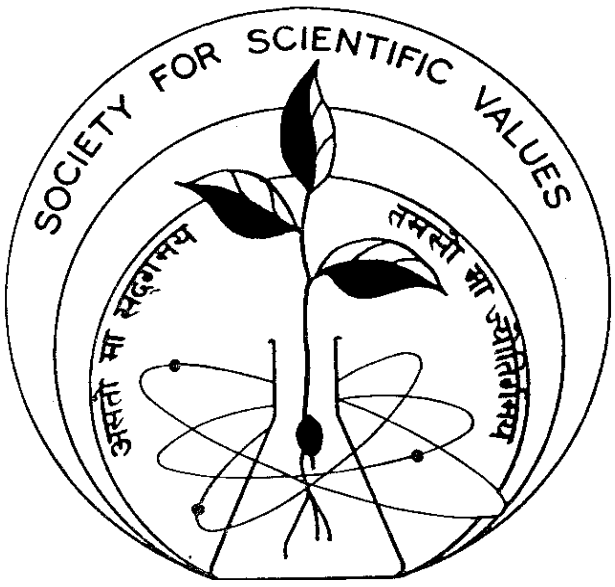

LEAD US FROM UNREAL TO REAL

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Main objectives of the 'Society for Scientific Values'

(i) To promote objectivity, integrity and ethical values in pursuit of scientific research, education and management, and

(ii) To demote and curb the unethical acts in these areas.

EDITORIAL

The Society has been publishing a bulletin titled 'Society for Scientific Values: News and Views'. The title of the bulletin has been changed from last issue to 'ETHICS IN SCIENTIFIC RESEARCH, DEVELOPMENT AND ADMINISTRATION', with a hope that it will transform into renowned journal in due course of time.

The readers are invited to contribute articles and letters to Editor on any aspect of ethics in science, technology, development and administration including the role of scientists in society especially in India and relation between science and spirituality. The manuscripts may preferably be sent by e-mail to both the Associate Editors. The typed and printed manuscripts should be sent to the Editor. The Society would also consider publishing a gist of some very good articles in its area of interest published elsewhere or reproduce full article if there is no restriction on its reproduction. The readers are welcome to send a copy of such articles to the Editor.

The issue contains a letter of Dr. R.S. Valluri, Ex-Director NRL, Bangalore and of Dr. Lalji Singh, Director CCMB, Hyderabad written to the Secretary, SSV expressing their views, expressions and suggestions about the bulletin. The articles included in this issue are: (1) 'Management of Science & Technology in India-Ethical concerns' by Dr. K.L. Chopra, Ex-Director, IIT, Kharagpur; (2) 'Where is Indian Science Going' by Dr. S.R. Valluri, Ex-Director, NAL; (3) 'Enhancing the Health of Science in India' by Dr. I.P. Abrol, Ex-Dy. Director General, ICAR, New Delhi; and (4) 'Making Management of Indian Science and Technology More Creative' by Dr. P.N. Tiwari, Ex-Project Director, NRL, IARI, New Delhi. Reports on the recently investigated cases of unethical acts in research, and some similar cases currently being pursued are also included in this issue.

The Society has been defending the cause of science in India against heavy odds by investigating specific instances of misconduct in scientific research and publication brought to its notice, and sending its findings to concerned institutions for taking appropriate action. Some of them have taken disciplinary action, while others pretended to ignore. To make the Society more effective it should be recognized by the Government of India as the prime Non-Governmental Body: (1) to articulate ethical issues in scientific research and management, and to formulate code of conduct of scientists and technologists and; (2) to investigate cases of unethical conduct in scientific research and management brought to its notice, and pass on the findings to concerned organisations for taking appropriate action. A suitable linkage of the Society with the office of the Prime Minister would help in taking its findings seriously by the concerned organisations. The 'Office of Research Integrity' established by the US President has been doing work similar to the Society in USA.

Letters to the Editors

To: Dr. P.S. Datta
Secretary, SSV

20th August, 2003

Dear Dr. Datta,

I just saw your e-mail about renaming the SSV bulletin. It is a welcome change. I note you have invited me to be on the editorial advisory committee. I will be glad to serve on it. Such a publication with wider circulation is badly needed to make the scientific community become aware of the need to control scientific misconduct. It is very important that it receives much wider circulation, particularly where it counts most, namely among the young scientists and the university student body.

It has been my experience that although there are many among the senior scientific community with unblemished records, they are not keen to take a stand in such matters, nor consciously inculcate a code of ethics among their junior colleagues. In fact when I was asked recently to address some new recruits to the CSIR labs in Chennai, it came as a no surprise for me when I was told that they were under pressure from their seniors to have their (seniors) names also included as co-authors of papers to which their contributions were nil. We do not seem to carry much credibility elsewhere in the world due to such practices and due to the involvement of people like vice chancellors indulging in such misconduct. It is all the more tragic that we seem to take note of it more if a foreign scientist draws attention to such practices, as for example in Rajput case or in the Gupta case.

I ardently hope like the Bulletin of the Atomic Scientists in the US which has become the keeper of the conscience of the nuclear scientists, the new SSV Bulletin will become the keeper of the conscience of the Indian scientific community to promote the cause of science, an ideal for which Prof. Raman founded the Indian Academy of Sciences and the Journal of Current Science.

With kind regards and good wishes,

Dr. S R Valluri.
Ex-Director
National Aeronautical Laboratory
Bangalore

To: Dr. P.S. Datta
Secretary, SSV

4th December, 2003

Dear Dr. Datta,

Thank you very much for sending me the August, 2003 issue of the Society for Scientific Values. The issue no doubt represents features from eminent authors and certainly will go a long way in helping the persuasion of aims and objectives of SSV. I have a few minor suggestions to make. 1. I looked at the web site of SSV. There is no provision for institutional membership. Why is it so, especially when active participation of the institution will certainly help in pursuing ethical issues? (Please refer to Page Nos.13 and 14 of Prof. P.N. Srivatava's article). 2. Membership list as it is on the web needs to be updated/revised; because a few members whose names appeared in the list are not living any more.

With regards and best wishes,

Lalji Singh
Director
Center for Cellular and Molecular Biology, Hyderabad

Management of Science & Technology in India: Ethical Concerns*

Prof. K.L. Chopra
Former Director, IIT, Kharagpur

Evolution of Ethical Concerns:

Ethics and values, simply defined, are a set of principles and a sense of purpose. Be good and do good to all, or do unto others what you would like others to do unto you are Vedantic and Biblical definitions. Ethical values evolve out of our consciousness and are fundamental to a civilized society.

At the dawn of civilization, the hunter-gatherer was blessed with personal spiritual values as a part of his/her consciousness. With the emergence of social groups, societal values in the form of spiritual and religious ethics evolved. During the early history of mankind, numerous philosophers, sages and religious prophets in different civilizations created classical and immortal literature expounding and codifying spiritual and ethical codes of conduct. Vedanta, Gita and Ramayana are classic in Indian civilization "Hippocratic Oath" devised as early as 400 BC as physician's code of conduct continues to be followed even today.

After the Industrial Revolution, ethical values assumed much importance in business and management. Consequently, during 60's, most Management Institutions incorporated ethics as co curriculum and some have established special departments for the subject. This also led professional institutions, societies and academics world over to draft relevant codes of conduct for engineers and scientists. As a result of revolutionary changes brought about by tech-nomic-globalization, digital convergence and knowledge power, 1990's have witnessed the emergence of Ethical Values to Centre stage of all professional societal activities. Just how important ethical values are in a variety of Life Science S&T areas is indicated by the fact that it is now a part of mandatory teaching and learning process in life science curricula all over the world.

The new millenium has ushered in enormous S&T activities on a molecular/nano level in physical, chemical, engineering, agro, medical and biosciences. Convergence and integration of some of these S&T areas has started taking place. This situation has created Ethical Frankensteins for the world to ponder over. Indeed, as a result, the need for evolving a universal code of conduct for S&T practitioners is being hotly debated by global academic, research and professional institutions.

Excerpts from the 2nd Dr. N.P. Datta Memorial Lecture delivered by Prof. K.L. Chopra on November 29, 2003. Dr. N.P. Datta was the Founder Director, NRL, IARI.

Paradigms shifts in S&T & Management

In order to appreciate the ethical concerns of S&T management, let us see what major paradigm shifts have taken place in both S&T and its management. Some significant developments are:

- S&T, meaning Knowledge, is becoming the pruning engine of growth of world economies
- S&T makes profit which, in turn, profits S & T
- Prosperity of a nation is given by $E=mc^2$ where m is the no. of creative knowledge workers, and c is the creativity
- Knowledge is highly competitive venture
- Global reach, interaction and collaboration in knowledge are increasing
  - S&T claims can be validated nearly instantly
  - Modern analytical tools allow rapid reverse engineering of S&T
  - Intellectual property is the wealth of a nation
  - International laws and watch dogs protect IPR
  - Individual and professional management of knowledge is sterile
  - Knowledge power rather than resources and capital needs to be managed
  - Management must be in tune with tech-nomic-globalization
  - Management deals with Human Resources for creativity, R&D for Innovation and IPR for capital
  - Successful S&T management must be professionally competent, credible, honest, transparent, fair, liberal and flexible and cultivate team work as in a symphony orchestra
  - Management should be sensitive to societal interactions, ethical viability of knowledge, and to develop partnership in progress with stakeholders.

We must mention the awesome mini fields of ethics which are being laid with the rapidly developing areas of molecular sciences.

- Genetics
- Molecular Medical S&T
- Agro-biotechnologies, GM plants, fruits, seeds and food
- Bioengineering
- Global Ecology and Biosphere
- Information S&T and enabled success (ITES)
- Global Digital Divide
- Space S&T
- WMD Technologies
- Bio, Chemical & Cyber Terrorism
- Nano science & Nano Technologies
- Convergent Technologies such as
  BANG (Bits + Atoms + Neurons + Genes)
  GRAIN (Genetics + Robotics + AI + Nanotech)

The paradigm shifts mentioned in the preceding make it clear that to sustain:

- Knowledge-driven tech-nomic-globalization
- Globally acceptable IPR protection regime
- Competitive and internationalized S&T

We must have globally acceptable ethics for the pursuit and management of S&T. History of the world civilizations shows that societies have risen to a higher level not through mechanical or archaeological efficiencies but for processing sound moral and ethical values.

S&T Management Styles

It is interesting to compare some of the prevalent management styles in R&D institutions in some countries:

American:	Contractual, hire and fire, result oriented, transparent, efficient, team work and ethic-centric
Japanese:	Honesty of purpose, loyalty, commitment, quality conscious, translucent, mixed ethical values.
European:	Quality conscious, family and ethical values.

Unethical Practices

As far as Indian is concerned, there is no discernable style. In fact, whatever works is the management style (Chalta Hai). There is obviously a need to culture and nurture an appropriate style which is based on concern for some of the following unethical practices, commonly found in varying degrees in different countries.

- Plagiarism
- Sharing credits in publications without significant contribution
- Massaging and falsification of data
- False claims
- Multiplication of publications of the same data
- Unfair/improper awards/research/promotions
- Lack of system transparency
- Parochial/regional/political factors in appointments/promotions/project funding
- Lack of respect for intellectual contributions of others and team work
- Lack of critical peer review
- Lack of credibility, honesty of purpose, commitment, societal concerns and interaction among knowledge workers
- Lack of guts to take punitive actions against unethical practices

Concluding Remarks:

1. With increasing role of knowledge power in the health and wealth of mankind, ethical values need sharper definitions and understanding among various cultures.
2. Tech-nomic-globalization demands global acceptance and adherence of a set of ethical values for personal and management of S&T.
3. Global Digital and Knowledge divide demands global attention to this problem lest the knowledge-rich design ethical values which enable rich become richer.
4. The more S&T comes closer to playing GOD at the living and non-living building block molecular level, the more serious and gigantic will be the ethical concerns in the pursuit of S&T and its management.
5. Nurturing of S&T management leaders in ethical mould must be a part and parcel of learning process in a guru-shishya "parampara" mode.
6. Only competent, credible, honest, transparent, fair, liberal, flexible, tolerant, bold and team spirited management have credentials for ethical concerns.

Where is Indian Science Going?

Dr. S. R. Valluri
Ex-Director, National Aeronautical Laboratory, Bangalore

1. Some time ago, a well known magazine in an article titled "Indian Science is Dead" extensively discussed the sorry state of affairs in the practice and management of science in India. A foreign scientist recently writing to the President that no less a person that the Vice Chancellor of a University was a party to plagiarizing shows that the situation has no improved. Many instances are now known where senior scientists have indulged in scientific misconduct, proven beyond reasonable doubt. It says much about our value systems that we tend to take cognizance of such misconduct only when foreign scientists draw attention to it. It is regrettable that more often than not, our managers of science tend to indulge in cover up, instead of taking salutary action in such cases. It is against this background we have to note a recent article in a major newspaper, by a well known scientist titled "Saving Science for our Future" and the recent editorial in Current Science founded by Prof. Raman "to promote the progress and uphold the cause of science" highlighting the very poor standards of Ph.D research in most of our Universities and the cavalier manner in which the so called thesis advisors function. They take credit as co-authors of papers resulting from the thesis, frequently knowing little of its contents. There is a fundamental contradiction in this, as the thesis is submitted to the university as "original contribution to the advancement of knowledge" by the candidate and after the degree is awarded, the "thesis advisor" suddenly becomes a co author!

2. Such developments raise a fundamental question. If the senior scientific community indulges in or abets scientific misconduct, who shall save Indian science and save science for whose future? - at this rate, not certainly for the country's future. Undoubtedly there are scientists in the country with unblemished records. But they seem to display a "flexible conscience" and "bounded rationality" and ignore their responsibility to take a formal stand to protect the cause of science to enable India join the developed world.

3. Several years ago, the attention of the Council of a Science Academy consisting of the then "who is who of Indian science", was drawn to the habit of a well-known scientist director routinely having his name included as the co-author of research publications from his lab and to which his contributions were known to be nil. The Council declined to take a stand on this issue and elected him a Fellow based on his own earlier contributions. Their argument was that at their level, it was not possible to establish such facts. The issue was raised again in Current Science journal, with a proposal that Science Academies should stipulate that Fellows who propose and second the nominations, should certify that the nominee has not violated a code of ethics framed by them. None of the Academies have so far framed such an honor code for compliance. Are these not examples of flexible conscience and bounded rationality?

4. Three years ago, the Central Vigilance Commissioner(CVC), convened a meeting attended by the then Principal Scientific Advisor (PSA) to the GOI, DGSIR and Secretary DST, to consider a proposal from the "Society for Scientific Values" to create an "Office

of Research Integrity" under the CVC, as an *ultimate appellate authority* to look into instances of scientific misconduct. The proposal was rejected in one sitting. If they did not want CVC to be involved, they could have asked for its creation under the PSA, if they cared for healthy growth of science and setting uniform precedents. The Supreme Court does this for the state High Courts. They seem to have cared more for their rights than their responsibilities to protect the cause of science.

5. An example drives home the seriousness of the problem. A division head in a major research laboratory *explicitly admitted before a committee appointed by the Agency head the irreproducibility of data in a paper presented by him at an international conference. The Chairman of the committee got reproducibility tests conducted, based on test condition the scientist claimed to have actually used, and unequivocally reported that the reported results were not reproducible.* *Reproducibility is the hallmark and essence of scientific research.* Based on this finding, nothing prevented the director from initiating appropriate disciplinary action. He was more interested in cover up. Despite this finding, and suggestion from two former directors from the same laboratory to close this case, his Agency Head constituted another committee, with wide ranging terms of reference which had little to do with reproducibility of the reported results. *Without conducting exact reproducibility tests, this second committee concluded that there was no scientific fraud but only mistakes!* This division head was re-designated as an advisor to the Director and subsequently promoted! Most certainly this is not an isolated instance. Can such decisions contribute to healthy growth of science and save science for our future?

6. To curb unhealthy practices in the US, President Clinton ordered that action be taken in cases of scientific misconduct (defined comprehensively by his committee), and proven beyond reasonable doubt, and ordered denial of future federal support to such scientists and their institutions. His Office of Science and Technology (analogous to the PSA) stated, "advances in science, engineering, and all fields of research depend on the reliability of data of the research record, as do the benefits associated with them in areas such as health and national security. Sustained public trust in the research enterprise also requires confidence in the research record and in the processes involved in its ongoing development". Should it come as a surprise that science that science thrives in the US while it is slowing dying in India? Is it not time for the Prime Minister to create an Office of Research Integrity under PSA to save science for the future of the country and help it to join the developed world?

7. Our senior scientists complain that they do not receive adequate support. There is truth in till recently, selling goods that were already obsolete elsewhere and function virtually as a service oriented industry, instead of becoming a substantially self reliant economy, with significant export capability. The result? While 70% of the low end consumer goods in this. But it hides more than it says. From about 0.23% GNP, research support since Independence, rose close to 1%. Successive governments liberally funded the creation of academic and S& T institutions, with the expectation that they would eventually contribute to a self-generating economy. However their support to create a self-generating S & T base was marginal. The crucial interaction among the academic

institutions, R & D and industry, which only can nurture such a base, has not been significant, except possibly in the project specific agencies such as Space and Atomic Energy. The Indian industry was happy to be left alone with their marginal in house R & D inputs, to limp from licensed production to licensed production, in protected markets the US are from China, India supplies barely 1% of the *same market*.

8. Our S & T agencies can certainly make tangible contributions to the technology base of the economy, when they have programs with major end objectives defined with close interaction with the industry. Their research support to institutions has been more often than not, based on the so called "expert committee recommendations" on proposals received by them or simply given as grants in aid. The scientific community has not realized that when they spend public funds, they are "*trustees for public good*" and that accountability must be built into their operations. "*Who is going to benefit downstream by their work*?" is a question rarely asked in these circles. It was this lack of relevance to national needs that prompted former Prime Minister, Mr. P.V. Narasimha Rao to reduce support for R & D for non project specific agencies. With our large S & T infrastructure, successes in the green revolution and in Space and Atomic Energy, are classic examples of what is possible with project specific planning and grants with built in accountability.

9. In the US, only about 15% of the federal R & D support goes for open ended basic research. The rest is used for specific technology development and related R & D programs to respond to well defined needs.

10. *The scientists need to ask if the government owes them a living, if they do not help establish a strong interactive S & T support base*. If the contributions of Indian scientists in the US are any indication, there is little doubt that they are capable of extraordinary achievements. Due to lack of interaction among the industry, and research and academic institutions and challenges, the best and the brightest of our S&T people are migrating, with the second best taking up jobs in industry and the civil services, and the rest seeking admission to do their masters and Ph.D. programs here. Is it then surprising that reverse filtration is taking place and second rate research and plagiarism and scientific misconduct have become common?

10. Research, and more so technology development, are expensive. Since funds are limited, the senior scientific community and the Agency Heads have a tremendous responsibility to assess the benefits to the nation while mounting their programs. They have to build inherent accountability by asking what direct benefits will the nation get for every rupee they propose to spend. Without such an approach, the President's vision for India's future, will most certainly remain an unachievable dream.

American Government Stand on Scientific Misconduct and its Relevance to the Indian Scientific Community

Dr. S. R. Valluri
Ex-Director, National Aeronautical Laboratory, Bangalore

Recognizing that protecting ethics in the practice and management of science is the responsibility of all scientists in our country, the Society for Scientific Values (SSV), a voluntary organization, was brought into existence about one and a half decades ago by a group of concerned scientists. Its membership included several fellows from the Indian Science academies, not to speak of some fellows of the Royal Society and other foreign academies. Its only strength is moral authority. Its findings are based upon proof beyond reasonable doubt. It is regrettable that frequently its findings were treated with indifference by the concerned institutions and agencies.

Recognizing the need for wider awareness of this issue, Pushpa Bhargava, the current President of the Society, organized a symposium on 'Ethics in Administration of Science' in April 2000. About 400 scientists who participated unanimously subscribed to a code of ethics for the practice and management of science. N.Vitttal, Central Vigilance Commissioner (CVC), in his eloquent inaugural address pleaded that scientists should follow an ethical code in the practice and management of their profession.

Taking up this idea, Bhargava and this writer pleaded that an Office of Research Integrity (ORI) should be created under the CVC, as an ultimate appellate authority. It was pointed out that it would not be a substitute for the heads of academic and R & D institutions and agency heads monitoring compliance with a prescribed ethical code. It was agreed that such a body under the CVC would have a powerful deterrent effect and would go a long way in assuring compliance with the code at the lower levels.

In his letter dated 16 March, 2000, the CVC informed this writer that a high level meeting was convened by him to discuss this issue. Apparently it was decided that at present there is no need for creating such a body in CVC. In the same letter, the CVC wanted to know whether such an ORI exists in any other developed country where scientific research has really progressed.

In response to this query, this writer contacted Irving Lerch, Head of International Relations of the American Physical Society. The information he gave was revealing. In his e-mail dated 24 November, 2000, Lerch indicated that the 'US Office of Research Integrity (ORI) was originally established by the Director of the National Institutes of Health (NIH) to deal with complaints concerning breaches of ethical conduct in the wake of a few high-profile scandals'. According to Lerch, 'NIH realized that research misconduct was indeed a serious issue, but that ORI was being misdirected and used improperly and abusing its discretion through the employment of questionable investigative tools'. This is a situation not unfamiliar to the Indian scientific community which cares to ascertain the facts. ORI apparently then 'began a campaign to inform the research community, government, the public and

corporations of the problems inherent in biomedical research. But the emphasis concerning scientific ethics was turned back to the learned and professional societies which have traditionally dealt with such matters'. It should be noted with some concern that similar bodies in India, including academics which command the respect of the scientific community, do not seem to have cared to face up to the problem of individual mal practices and examine them through ad hoc committees with the sincerity the issue deserves.

Lerch went to the state, 'within the US system - which is highly variegated and quite complex - responsibility is shared among professional and learned societies, funding agencies, institutions and individuals. But most important is the role of peer review in the examination of research proposals and manuscripts submitted for publication. Without a community of scholars jealous of its standards and devoted to research integrity, there can be no solution to the problem'. This is the crux of the issue in India too. Even after proof of scientific misconduct beyond reasonable has been established, institutions would seem to be reluctant to take deterrent disciplinary action against such scientists and instead prefer to exonerate them, if not let them go scot-free.

The issue of scientific misconduct was then taken up at the level of the US President, Richard M. Jones of the Public Information Division of the American Institute of Physics in his letter of 12 December 2000 to this writer, states: 'More than four and one-half years after discussions began about a research misconduct policy, the Clinton Administration last week issued a final 'Federal Policy on Research Misconduct'. This government-wide policy is to be implemented by 6 December 2001, with the assistance of a National Science and Technology Council Implementation Group (NSTCIG)'. This is in striking contrast to the manner in which the Indian Committee convened by the CVC appears to have apparently resolved the issue at a single meeting.

The Clinton committee has defined research misconduct as 'fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. Fabrication is making up data or results and recording or reporting them. Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record. Plagiarism is the appropriation of another person's ideas, processes, results or words without giving appropriate credit. Research misconduct does not include honest error or differences of opinion'.

The policy goes on to describe 'Findings of Research Misconduct'. 'A finding of research misconduct requires that: there be a significant departure from accepted practices of the relevant research community: and the misconduct be committed intentionally, or knowingly, or recklessly; and the allegation be proven by a preponderance of evidence'. In this connection, the US Office of Science and Technology Policy (OSTP) states, 'Advances in science, engineering, and all fields of research depend on the reliability of the

Enhancing the Health of Science in India

Dr. I.P. Abrol
Director
Centre for Advancement of Sustainable Agriculture
C-9/9564, Vasant Kunj, New Delhi-110 070.

Friends,

I am happy to be in today's (October 10, 2003) meeting of the Society for Scientific Values to discuss on "Ethics of the Management of Scientific Instituions", held at INSA. Thanks to Prof. K.L.Chopra for inviting me to join. I have been aware of the existence of this Society and the kind of issues that are being raised and discussed but I am attending for the first time. From what I have heard this forenoon and from my past understanding the issues being deliberated are important and should be a matter of deep concern to the scientific community of India. These deliberations have repeatedly drawn attention to the increasing extent of mal practices that are present amongst practicing scientists, research scholars, science managers and administrators. Issues that have been highlighted from time to time included falsification of data, plagiarism, awards of Ph.D. degrees, wrongful appointment, biased awards etc The ways out have also been deliberated extensively on this form and solutions to the problem have been suggested encouraging more dialogue on these issues by the professional societies, need for scientific institutions to quickly inquire into any allegations and punish the guilty, bring about greater transparency in appointment, rewards etc. In the end I also see a kind of despondency emerging that all said and done' nothing is happening in this country. This being so, the question that we need to ask ourselves in where do we go from here? I would like to look at things from a slightly different angle. I think what we are all concerned is that all is not well with the health of Science in India - and this is getting manifested in many ways including declining ethical values etc. Thus we have been worried about the symptoms (and rightly so) and ways to treat these. In my view the answer to the problem lies in starting look at the bigger question of how do we go about enhancing the health of science in India. The next question is why do we need a healthy science?

The real problem with majority of us in the scientific community is that we do not enjoy what we are doing. We do not enjoy what we do. We have no mission to perform, no goals to be achieved. Most of us are at our own-free to decide what we want to do and the way we want to do. Few of us who are doing well are the best - they have the capability or an opportunity to work at cutting edge and that is what we call the best of science. However unlike these few, most of us require that some one care for what we do and that what we do means something to some one. In recent years a silent but a major shift is taking place globally which requires that science play more a direct role in addressing societal issues. This is contrary to generally held view that science is for sake of science and new knowledge and that it has a spill over effect on society. Science, technology and innovation for Sustainable Development' was the theme of a major conference on the occasion of Sustainable Development summit at Johannesburg. There is increasing realization that Science, Technology & Innovation can and must occupy a driver's seat in ushering a new era of development. How will this happen? The only way this will happen in for the scientific

community to change the way that we identify prioritize and implement scientific efforts. There is an increasing mass of opinion according to which society must have a say in public funding for science is for the society. Thus the need for a democratic process in setting our science agenda. The process of change which the emerging paradigms call for is not going to be straight forward. The Science & Technology Policy 2003 of the Government of India has many of these elements in place. The scientific community as a whole and groups like this have a role to play in ushering this change. This change is important to give the scientific community a mission to achieve and goals to more forward towards. I am of the view that groups such as this one have to carve out a role for themselves which is complementary to other actors like INSA which has a mission to contribute to enhancing the health of science in India. This role, I believe has to be in tune with demands for the change in the way we conceptualize science agenda, the way we prioritize plan and execute our research, the way we establish linkages with out stakeholders, the way we maintain the health of science, and so forth. I have a conviction that groups such as this can contribute effectively to change agenda that we wish to happen urgently.

Making Management of Indian Science and Technology More Creative

Dr. P.N. Tiwari
Ex-Project Director
Nuclear Research Laboratory
IARI, New Delhi

Output of any organised activity including scientific research and development depends directly on the quality of its management. India has many scientific and technical institutions, some of which are very well equipped, and have very good scientists on their staff. Still, the scientific output in terms of discoveries, inventions and innovations is rather poor. Even the number of good quality papers published by Indian scientists and technologists is decreasing. It shows that management of scientific organisation is not quite conducive to creativity. Dr. Narlikar has focused on this issue in his article on 'Creativity as Cornerstone of Science' published in The Times of India; sometimes ago. He ended the article saying 'I believe we need seriously to rethink the entire scientific framework in the country to see to how it can be made more creative'.

Creativity is in the mind of competent and contemplative person free from any kind of apprehension. To be creative is : to enjoy one's work; to like the ambience of the work place; to feel challenged to give the best; and to enjoy rapport with one's superiors. A work place would be buzzing with joy and positivity when truth is not suppressed or distorted, organisational hierarchy and authority is underplayed, channels of communications are open and transparent, uncomfortable questions are allowed and responded to, new ideas are allowed to flourish and sycophancy is discouraged.

These requirements of enhancing the creativity are to be met by management. Are these being met? Do the scientists and technologists working in most of our scientific organisations enjoy their work and like the ambience of their work place? How much is the team work and self imposed discipline? Is the organisational hierarchy really underplayed? Are uncomfortable questions allowed and responded? What about the truth, the search of which is the ultimate aim of research? Is it not being often distorted and sometimes even completely suppressed to suit the convenience of the man in power? Above all, is the main incentive to creativity namely, pay and promotion, not being mullified by obliterating the distinction between creative and uncreative persons by time based faulty pay structure coupled with lack of objectivity in the assessment of the work of scientists and technologists? Sycophancy has become a substitute of creativity for getting pay and promotion. Are these not serious defects of the management? How to correct these crippling defects?

The solution of the problem is very complex from one point of view, and very simple from another. It is very complex if one goes by detailed rules and regulations and very simple by following role models. Why go in for complex solution if a simple one is possible? However, the emphasis at present is to manage scientific organisations by detailed rules and regulations, which in principle is absurd, because rules and regulations are framed to manage known areas and known problems whereas, in scientific research one treads

unknown areas and unknown problems. Perhaps that is why when I asked the Registrar, TIFR about the rules and regulations, after joining it as a Visiting Member in 1964, he told me not to bother about rules and regulations; whatever is required for the research work is done, and that is the rule in TIFR. During my two years' stay there, I did not hear even a murmur of any kind of bias or favouritism in selection, promotion and recognition. Dr. Homi Bhabha was the Director. But he was not involved in most of the selections and promotions. It was being done by other members of the Institute. The environment was such that no one acted unjustly. The team work was the order of the day. The creativity of each item was quite high. The Institute was being counted among the best scientific institutions of the world.

The question is how to find such role models. At present some such persons become head of scientific institutions by chance. They have made major improvement in the working of Central Universities, IITs and other scientific institution during their tenure. The appointment of such persons as head of the institution should not be left to chance; but they should be identified and appointed by design. Apart from being professionally competent, such persons are very honest courageous, consistent, liberal, dynamic, flexible, polite and firm. They are unselfish, unbiased and unprejudiced. In other words, they are men and women with integrity of very high order.

Success in any human activity depends on a combination of three factors, namely: intellect, industry and integrity. While the intellect and industry play major role in acquiring professional competence, integrity becomes paramount in acquiring excellence in management, especially of scientific and technical organisations. In a Workshop on 'Excellence and Beyond' organised by a spiritual organisation, Shri J.E.Sreedharan, Chief of Delhi Metro Rail Corporation, who had earlier successfully implemented several difficult technical projects including the construction of Konkan Railway was one of the participants. A senior IAS officer asked him to tell the secret of his success in one sentence. Sreedharan replied that he will tell it in one word, and that is 'integrity'. Integrity plays a paramount role in the management, especially, of the scientific organisations. Unfortunately, however, the role of integrity in the selection even of the directors of scientific institutions, at present is limited to its innocuous entry in a column in the confidential report which invariably is written as 'beyond doubt'. In effect integrity has no place in selection. In earlier day, integrity was not given much consideration in selection, perhaps because persons who were found fit to be considered for the high post were all men and women of high integrity. That is not the case at present because of general degeneration of the moral level in the society. Many persons who are professionally competent are not morally upright and honest although, these qualities are essential and indispensable for managing scientific institutions. In the present days, professionally competent persons of high integrity are very few. Therefore, the selection process should be so geared as to identify these few from among many professionally qualified persons. The task of assessing integrity is a bit complex. A parameter for assessing overall integrity of a person is his reputation. It would be quite effective in this case because a person being considered for the high post would have already worked in the area for a long time, and would have acquired some kind of reputation about his integrity among his colleagues. Many of them would express it objectively if enquired in an indirect and informal way without letting them know the purpose of the enquiry. The exercise would

be worth the trouble in the interest of the proper management of our scientific institutions. A group of good scientists, managers and a few legal experts should discuss in depth the entire matter of designing selection process for identifying persons of high integrity with professional competence for the post of the directors of scientific and technical institutions. This will not only increase scientific and technical output but will also work as a major incentive for improving integrity of scientific community as a whole. Thus a single act of appointing professionally competent men and women of proven high integrity as heads of scientific and technical organisations will have multiple effect in raising the creativity of these organistions. In the present situation, there is no other simpler way to raise the creativity.

Report on Recently Investigated Cases of Plagiarism

1. Professor **V S Rajput**, Kumaon Univ:

Prof. Kavita Pandey , Head, Physics Department, Kumaon University brought to the attention of SSV, and a number of prominent particle physicists in India and abroad that Prof Rajput, a former Head of the same department and presently serving as the Vice Chancellor of the University, in co-authorship with his research students have indulged in serious unethical practices of plagiarization of published research papers of others, as also of publishing same/similar papers in more than one journal. The SSV examined the published papers in question, and sought information/ clarification from both Prof. Pandey and Prof. Rajput. Prof. Rajput maintains that his former research student and his co-author has plagiarized the paper and has put his name on the paper without his permission. Merit of this argument apart, as the VC, Prof. Rajput has taken no disciplinary action so far against his former student and presently his faculty member of the University. Having confirmed this serious case of plagiarism and unethical practices, as has also been done by several other prominent Particle Physicists in India and abroad, the SSV has written to the President of India, the Governor of Uttaranchal (who is the Chancellor of the University), Minister, MHRD, and the Chairman, UGC, urging them to take a strict disciplinary action against Prof. Rajput. After considerable moral pressure by a number of scientists world over, the Chancellor has set up an enquiry committee under the Chair of a retired Judge. The immediate pas Secretary, SSV Prof. (Mrs. Indira Nath was nominated by the INSA as its member. The Committee found Dr. Rajput guilty.He has been removed from the VC Ship of the Kumaon University

2. Drs. Rashmi Mishra and Sapna Johnson, Centre for Science & Environment, New Delhi & Padma Vankar, FEAT, Indian Institute of Technology, Kanpur:

Rashmi Mishra et al have submitted a paper " Analysis of Pesticide Residues in Fruits and Vegetables from different Mandis of Delhi " to J Analytical-Science for publication. This paper has been largely plagiarized from a paper " Monitoring of Pesticide Residues in Summer Fruits and Vegetables from Kanpur" published in Bulletin Environmental Contamination and Toxicology by Dr R Sanghi and Dr V. Tewari of Facility for Ecological and Analytical Testing (FEAT), IIT, Kanpur. The SSV has examined the two papers and have verified that Rasmi Mishra et al have not only plagiarised the paper extensively but have also made false claims. The SSV has written to Dr Sunita Narayan , Director, Centre for Science & Environment and Prof. S G Dhande, Director , IIT, Kanpur to seek their comments and to urge them to take appropriate disciplinary actions against their respective colleagues, if called for. Dr Narayan has informed that Dr. Vankar did not seek permission of her two colleagues in the Centre to be the co-authors of the paper. Nevertheless , she has taken steps to see that such a thing is not repeated . What these steps are and how Dr. Padma Vankar, who is also a Consultant to the Centre for Science and Environment, is affected, has not been clarified. On the other hand, Prof Dhande has not bothered to respond, despite reminders. We, however, understand that Prof. Dhande set up an Enquiry Committee, the report of which is with him for over two months. The SSV is very concerned that an Institute of national importance is not prepared to face the reality of a scientific fraud committed by a scientist of the institute and to take suitable action as a deterrent for such unethical practices.

Having exhausted our moral power of persuasion, this case is being brought to the attention of the Chairman, BOG, IIT Kanpur, Minister, MHRD and is also being put on our Web page (www.scientificvalues.org). We hope the institutions concerned will deem it important to have researchers imbibe ethics and values in the pursuit of science and technology.

3. Prof. Ajit Sodhi, School of Biotechnology, Banaras Hindu University, Varanasi – Regarding alleged academic fraud by Dr. S.M. Singh, Reader, Department of Biotechnology, BHU.

The Society for Scientific Values considered Dr. Singh's act of deleting Prof. Sodhi's name as co-author is unethical, irresponsible and tatamount to academic fraud. Dr. Singh's claim that Prof. Sondhi had instructed him to remove his name and furthermore delete it at the galley proof stage is not supported by any written instruction from Prof. Sodhi. When authorship changes are made, written instructions are mandatory. As such, Dr. Singh's explanation is not acceptable and Dr. Sodhi's complaint stands vindicated. However, the SSV feels that Dr. Sodhi have also been irresponsible in his behaviour by claiming to influence Dr. Singh's selction to Reader's post when he was 'not suitable'. It is an impartial selection committee of the university and not an individual that selects and individual to a faculty post. Also, writing letters to DBT and Humboldt Association against a junior colleague does not add dignity to the Chair occupied by Dr. Sodhi.

Report on Cases of Plagiarism Currently Being Investigated

Prof. K. L. Chopra
President, SSV

1. Plagiarism Case at CEERI, Pilani

A director grade scientist and his colleagues at CEERI, Pilani have published in J. Acoust. Soc (India) three papers which are plagiarized in toto from the papers of pioneering researchers in USA. The Society for Scientific Values has investigated this serious case of plagiarism and reported its findings to Dr. R. A. Mashelkar, the Director General, CSIR. The DG set up some committees to look into the matter. After several reminders by the President, SSV, the DG has finally informed after a lapse of over three months that the plagiarists have been found to be guilty and that appropriate punitive action will be taken after due process. In the meanwhile, the senior scientist continues to enjoy CSIR Emeritus Scientist status which is most unfortunate. We will continue to remind the DG the need for a quicker action in such cases.

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2. Plagiarism Case from El Sheikh Campus, Tanta University, Egypt

Prof Mohd Helal, Member Executive Committee, Egyptian Mathematical Society and Prof Wronski of USA have brought to the attention of the President, SSV that Prof (Ms) Dr Laila Rashid of Tanta University has been fraudently publishing a no of plagiarised scientific papers in various International journals in several countries, including the INSA journal: J of Pure and Applied Mathematics over a number of years. Plagiarisation has now been established. One international journal has already blacklisted the plagiarist .The President, SSV has sent the required information to the Editor, Prof. V Kannan, of the INSA journal. Prof Kannan has promised suitable action after a meeting of his editorial board.

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3. Memorandum on Scientific Integrity

The President of All European Academies (ALLEA) has circulated a Memorandum on Scientific Integrity to its federation of 48 Academies of Arts and Science in 38 European countries. This Memorandum highlights the need to be vigilant on unethical practices which are on the rise and has urged the National Academies to set up National Committees on Scientific Integrity under their auspices for promoting and maintaining scientific integrity. As Advisory Bodies, such National Committees are advised to investigate cases of infringement of scientific integrity brought to their attention. The Council, Society for Scientific Values has also discussed similar issues and has proposed setting up of similar type of advisory bodies in our scientific institutions.