

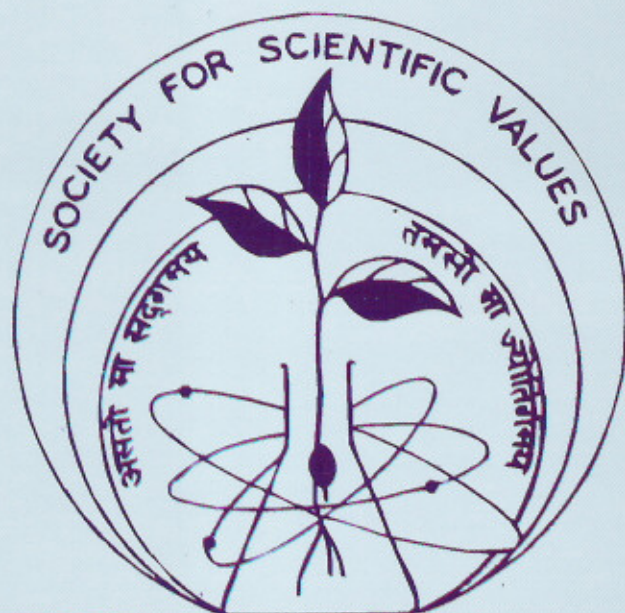
Society for Scientific Values

**Ethics in Scientific Research
Development and Management**
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

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

Website : scientificvalues.org

Editorial

Decline of Indian Science

Triggered by the Scientific Advisor to the Prime Minister, Dr. C.N.R. Rao's letter to the PM about 'Crisis' in the field of science, there has been spurt in the news about the decline of Indian science. Hindustan Times published such news on July 22, 23 culminating into a full page report on 'Decline of Indian Science' on July 24, 2006. A portion of the report is reproduced on the next page. Other news papers and magazines also published similar news. The question is, is this decline recent or it has been going on for the last several decades. The Society for Scientific Values has been pointing out this decline ever since its inception in 1986 at the risk of being called denigrator of Indian Science. Even in this issue of the bulletin there is an article on this aspect by Dr. P.N. Srivastava, former Vice-Chancellor JNU. There is also a report in it on the lecture delivered by Dr. P.V. Indiresan, former Director IIT, Madras in a seminar organised by SSV on 'Accountability of Scientific Institutions and Whistle Blowers Protection Act'; in which **he stated that most of Indian R&D do not bear fruit.**

However, Dr. C.N.R. Rao deserves credit for pointing out the crisis in Indian Science despite being on the position of power. **But his proposal to give more salary and free house to scientists can at best be a peripheral remedy.** No doubt, bright young students will join research and development in science if given more salary and free house, but they will fall in the same rut unless the main cause of the crisis is eliminated. Unfortunately, **most scientists in power do not even speak of the main cause what to talk of eliminating it.**

An article in this issue of the bulletin about late Dr. J.N. Kapur, eminent mathematician, educationist and promoter of ethics and norms of science has clearly brought out the main problem and presented the solution in a straight forward manner as enunciated by him. He had made an in-depth study of the problem and presented enough facts to show that **main cause of decline in Indian science is the laxity in adherence to ethics and norms of science in research, education and management. To prevent the decline further and raise the quality of research and education, Prof. Kapur proposed a fifteen points code of conduct for scientists and seven points code of conduct for science students.** It is high time for the scientists in general and science managers in particular to see how far they have gone away from the values enunciated by Prof. Kapur. There is no doubt whatsoever that the Indian scientific community has considerably deviated from the values that are essential for doing good science. We should collectively work to correct the deviation. Scientists in power must first correct themselves and then take lead in bringing about corrections in the staff in their organisations.

— P.N. Tiwari

News

1. **The second Dr. A.S. Paintal Memorial Lecture will be delivered by Dr. R.A. Mashelkar – Director General CSIR and President INSA - in October 2006.**
2. The Society has decided to hold a one day **seminar on ‘Autonomy and Responsibility of Scientific Institutions’** in Nov – Dec 2006. Dr. K. Satyanarayana, DDG, ICMR and member of SSV - EC will be its convenor.
3. **Dr. Ashima Anand Jt. Secretary SSV was invited by the Scientists Club of Rawalpindi to speak on Science & Ethics. She was there on May 26, 2006. The meeting was chaired by the President of Pakistan Science Foundation.** The audience consisted of university students from Rawalpindi-Islamabad area, who were aspiring for a career in science and young scientists from national research laboratories who had already experienced unethical practises in their respective domains. Also present were an older group of science administrators who had been trying to inculcate ethical values with personal examples. **Each group appeared to be strongly motivated to find ways of empowering their system of stemming the spread of unethical scientific research activity.** Although the topic encompassed the obligations of scientists, as a consequence of their activities, towards the well-being of the society and the environment in general, she chose to talk to them about the corrupting issues affecting the conduct of scientific research in laboratories. **She also apprised them about one of the newer interests of the ‘Society for Scientific Values’, which is to advocate for the whistle-blower’s protection act, which if we could be successful with, would add to the robustness of our endeavour.** The greatest interest of the audience obviously lay on how to prevent these problems from growing: she suggested starting at the school level where the first foundations of fudging results in the laboratory are laid.
4. There was a full page report on **DECLINE OF INDIAN SCIENCE** in Hidustan Times , New Delhi on July 24, 2006. A portion of the report is reproduced below;

Decline of sciences is an odd topic of debate in a country viewed as a power house of knowledge industry. S&T research in Indian universities and institutions of excellence has long been a victim of poor policy direction. Above par scientists are pushed to migrate elsewhere if not for insufficient funds or lack of choices, then due to favouritism of seniors or political interference. **A frustrated Prime Minister’s Scientific Advisor C.N.R. Rao predicts that at this rate Indian science will be finished in the next five years.** Call him an alarmist but you can’t ignore the empirical evidence of falling standards.

Eugene Garfield, the American pioneer in mapping scientific information, showed that in 1973 Indian scientists accounted for about half of the developing world’s quality science papers. In the seventies, his bench mark Science **Citation Index placed India at 8th place behind only US, UK, USSR, France, Japan and Canada. By 2000, India slid to 15th position.** Many scientists argue that mission-oriented research is a better indicator than the number of citations. But, sadly, two of India’s prestigious research missions – **on agriculture and defence – are monumental fiascos.**

Prof. J.N. Kapoor - Promoter of Ethics and Norms of Science

P.N. Tiwari

Ex-Project Director, Nuclear Research Laboratory, IARI, New Delhi
and

A.R. Verma

Ex-Director, National Physical Laboratory, New Delhi

Prof. J.N. Kapur was not only an eminent mathematician and educationist, he was also a very dedicated promoter and teacher of moral values which is quite rare quality in our country at present. His book on 'Moral Values for All' is a comprehensive compendium of moral values for different sections of the society. He has written about 100 books and 500 research papers on mathematics, and 5 books on higher education. While mathematicians and educationists will highlight his contribution in mathematics and education, we will focus on his contribution as promoter and teacher of ethics and norms of science. We had been closely associated with him in this aspect of his work on the forum of the 'Society for Scientific Values' that was established in 1986 with Dr. A.S. Paintal, FRS as founder president to promote objectivity, integrity and ethical values in the pursuit of scientific research, education and management. Prof. Kapur was its founder member, Vice-President and editor 'News and Views bulletin'.

Prof. Kapur was not only deeply concerned, like many other scientists with the deteriorating quality of research and education in science in our country; he had also made an in-depth study of its main cause. He used to relentlessly expose this problem and advocate its solution on various forums in the country. He was quite straightforward and simple in the presentation of the problem and its solution. In the seminar on 'Scientific Values and excellence in Science' organised by the Society for Scientific Values (SSV) in 1989, he was the main speaker of the session on 'Scientific Values in Education and Research in Science'. **He presented a comprehensive account of the unethical and unscientific practices prevailing in the conduct of science-practicals in schools and colleges, practical examinations, Ph.D. research and higher level scientific research. He presented enough facts to show that the main cause of the decline in the quality of education and research in science is the laxity in adherence to ethics and norms of science in research, education and management. He quite convincingly argued that any amount of funds and facilities will not raise the quality of research and education in science unless the scientific community as a whole raises its moral standard to a level where unethical and unscientific practices are not tolerated at all. His conviction is also supported by the fact that before independence when funds, facilities and salaries were available much less than today, some very outstanding original contributions of great value in science were made in India by Raman, Saha, Bose, Bhabha and others who were all man of very high integrity. They did not tolerate dishonesty of any kind by any scientist. To prevent unscientific practices and to raise the moral standard of the scientific community, Prof. Kapur proposed a set of code of conduct for scientists and another set for students.**

Code of conduct for scientists proposed by Prof. J.N. Kapur

1. I believe that science is a 'relentless pursuit of truth' and to realize this noble goal, I shall always employ noble means and no others.
2. I shall pursue all values of science like originality, creativity, impartiality, fairness, objectivity, integrity, excitement and passion for new knowledge, and love for truth. I shall observe these values, not only in my scientific work, but also in all my actions, both in letter and spirit.
3. **I shall never 'cook' results of my experiments, and shall also see, to the best of my ability, that neither my students nor my colleagues do so. I shall never make undue claims for my work. Under no conditions shall I claim any other scientist's work as my own.**
4. **When I conduct examinations, either for theory or for practical, I shall be completely fair and impartial without any exception, and I shall refuse to be swayed by any pressures, whatever the cost may be.**
5. I shall conduct examinations in only those topics in which I am fully competent and in no others. Similarly I shall examine thesis in only those subjects in which I have sufficient up-to-date knowledge. I shall examine every answer paper, research paper and every thesis with the greatest care. I shall not recommend the award of a Ph.D. degree unless I am convinced that the thesis deserves the degree.
6. **I shall give due credit to all my students and colleagues who contribute to a research paper. I shall never claim to be an author of a paper to which I have not made a substantial scientific contribution.**
7. **I shall award all scholarships, fellowships, projects, prizes, faculty positions, scientists-positions, solely on scientific merits of candidates and projects. I shall never yield to political or social pressures or be swayed by considerations of cast, creed, regionalism etc. I shall myself never make other-than-scientific recommendations and shall refuse to listen to non-scientific recommendations. I shall always try to create a climate in which making non-scientific recommendations is looked down upon as a scientific crime.**
8. I shall promote quality in science by all means at my disposal.
9. I shall promote scientific temper, scientific culture and scientific scholarship in society. I shall work for the promotion of the highest scientific and moral values in society.
10. I shall draw inspiration from and give my respect to only dedicated and devoted scientists who pursue the highest scientific values and not to those who may be in positions of power but do not follow the highest moral values in their work.
11. I shall never justify any action against the above norms, on the plea that since many scientists are violating these, it does not matter if I also violate these, specially when I benefit personally by violating them.

12. I shall always believe in free and fair discussion and respect dissent in scientific matters. I shall try to be helpful to all scientists in their work; at least I shall never put obstructions in their work.
13. **I shall not engage in unethical practices myself and I shall not, as far as possible, be a passive spectator of these by others.**
14. **I shall work for a system in which persons indulging in unethical practices are looked down upon and in which persons observing these are respected.**
15. I shall work for an open system in which there is minimum secrecy in all scientific work.

Code of conduct for science students proposed by Prof. J.N. Kapur

1. I shall always be curious and inquisitive about all natural phenomena and shall try to find the truth about these phenomena by careful observation, experiments and logical thinking.
2. **I shall never 'cook' my experimental results or copy the observations of others because these actions are against the spirit of science.**
3. I shall faithfully record in my notebook only the results of experiments conducted by me since this is what is expected of every student of science.
4. **Like every scientist, I shall always be guided by facts, logic and reasoning and never by superstitions or by prejudiced or preconceived notions.**
5. I shall never use unfair means in any examination under any circumstances, since all unfair practices are anti-science.
6. I shall follow in all my actions the great scientific values of objectivity, creativity, originality, desire to know and desire to follow the truth wherever it leads us.
7. I shall enjoy the learning of science throughout my life and shall aspire for the highest excellence in science. For achieving this noble objective, I shall use only noble means and no others.

One may argue that these codes are too idealistic and those who like to violate the code would be the first to sign it. This may be true to some extent but science is search of truth, its practitioners will have to have very high ethical standard, and the violators of ethical values will have to be punished. How else a healthy scientific community would develop.

Analysing the characteristics of a healthy scientific community Dr. Jacob Bronowski, Professor at world famous Massachusetts Institute of technology, had stated that "by the worldly standards of public life, members of scientific community are oddly virtuous in their work. They do not make wild claims, they do not cheat, they do not try to persuade at any cost, they appeal neither to prejudice nor to authority, they are often frank about their ignorance, their disputes are fairly decorous, they do not confuse

what is being argued with race, politics, sex or age, they listen patiently to the young and to the old. Individually some scientists, no doubt, have human weaknesses. But the body of scientists is trained to avoid and organised to resist every form of persuasion but the fact. Independence and originality, dissent and freedom, and tolerance, are the first needs of science. Truth is the drive at the centre of science. It confronts the work of one man with that of another and grafts each on each, and it cannot survive without justice and honour and respect between man and man. Only by these means can science pursue its steadfast approach to explore truth. **If these values did not exist, then the society of scientists would have to invent them to make the practice of science possible.”**

By articulating a comprehensive code of conduct for scientists and science students, and advocating its adoption, Prof. Kapur has made a unique contribution for the development of a scientific community that would meet the requirements laid down by Jacob Bronowski for the practice of first rate science. Prof. Kapur was of firm view that the values related to these codes must be instilled in the mind of students at the school level itself. And to facilitate this, he made consistent effort at the forums of SSV and NCERT that led to the printing of the following ‘Science related Values’ in the beginning of all science and mathematics books for class IX to XII published by NCERT from 1992 onwards.

Science Related Values

Curiosity, quest for knowledge, objectivity, honesty and truthfulness, courage to question, systematic reasoning, acceptance after proof/verification, open-mindedness, search for perfection and team spirit are some of the basic values related to science. The processes of science, which help in searching the truth about nature and its phenomena are characterized by these values. Science aims at explaining things and events. Therefore to learn and practice science -

- Be inquisitive about things and events around you.
- Have the courage to question beliefs and practices.
- Ask ‘what’, ‘how’ and ‘why’ and find your answers by critically observing, experimenting, consulting, discussing and reasoning.
- Record honestly your observations and experimental results in your laboratory and outside it.
- Repeat experiments carefully and systematically if required, but do not manipulate your results under any circumstances.
- Be guided by facts, reasons and logic. Do not be biased in any one way or the other.
- Aspire to make new discoveries and inventions by sustained and dedicated work.

Prof. Kapur was quite uncompromising towards violation of scientific values by the scientists. This is reflected from his following comments made in the session on ‘Fraud and Misconduct in Science’ at the SSV seminar 1989;

“It has also been argued that scientists are no better or worse than other human beings. Since there is corruption in the society, scientists are also likely to be corrupt, since most people misuse power, scientists can also misuse power, since other give unfair awards, scientist can also give awards to undeserving scientists and we should not worry too much about it. **However, it is not true that scientists are just like other human beings. They have had the privilege of scientific education and they have the power to discriminate between what is scientific and what is not. They are being supported by the society to find the truth about natural phenomena. They claim that science is pursuit of truth. Politicians do not claim that their aim is to find the truth; their aim is to capture power by any means whatsoever. Since we claim to pursue ‘truth’, we can use only scientific and ethically correct methods. Scientists know that unscientific practices cannot lead to excellence in science.**

There are scientists who express great concern about ‘quality and excellence’ in science. They do not mind making unfair appointments or giving unfair grants and projects. I wonder if they realize that every act of favouritism, nepotism, regional or cast prejudice is a nail in the coffin of excellence in science. Once the feeling spreads (and it has already spread widely) that in science it is influence and not merit that matters, we can easily forget about excellence in science. Our seminar is on scientific values and excellence in science and we have to accept as an axiom that the degree of excellence is proportional to the degree to which we follow scientific values and is also proportional to the degree of fairness and impartiality in the system.”

In his mission to develop healthy environment of education and research in science, Prof. Kapur made the following valuable suggestions at the SSV seminar on ‘Scientific Misconduct and Disciplinary Action’ 1995, to discourage and prevent unethical acts;

1. **Whenever misconduct is proved, strict punishment by scientific community should be given. This should involve loss of membership of all scientific societies and loss of all fellowships of academies for a specified period of time.**
2. It is expected that employing agencies would also take action against scientific misconduct, but if they fail to do so under political pressure, the scientific community should not cooperate with such employing authorities.
3. The funding agencies should stop grants to all scientists who indulge in scientific misconduct.
4. The following steps should be taken to prevent scientific misconduct:
 - a. Use internal examination system with answer books available for everybody to see.
 - b. **Let all approved Ph.D. theses carry names of examiners and let every such thesis be deposited in a designated library from where everybody can get a photocopy.**
 - c. Develop clear-cut criteria in detail in writing for all appointments and promotions and awards.

- d. Require justification by the committees which make the decisions.
- e. Insist on mutual accountability of teachers, scholars, scientist and funding agencies.
- f. Make information available about all research projects specially large projects.
- g. **Every university, research laboratory, professional body should have a standing ethics committee to draw guidelines for codes of conduct and take suitable action against those guilty of scientific misconduct.**
- h. Develop code of conduct for all professions for example Architecture, Engineering, Science, Medical etc.
- i. Develop courses in professional ethics through free discussions with students (since ethical values are useful to all members of a group, students should welcome those).
- j. **Develop a scientific system without secrecy and with accountability.**
- k. Launch massive education campaigns against the ill effects of scientific misconduct.
- l. Develop a climate in which there will be respect for genuine scientists and not for powerful scientists.

The suggestions made by Prof. Kapur formed the basis of overall recommendations of the seminar.

It is well known that Prof. J.N. Kapur was an eminent mathematician and educationist. What is not so well known is the fact that he dreamt of morally resurgent India commanding respect in the community of nations based on its high moral standards. His constant endeavour to promote ethics and norms of science was a step in transforming the dream into reality. In his book on 'Ethical Values for Excellence in Education and Science' he has convincingly argued that without perfect ethical values, we cannot attain excellence either in education or in science or in society. **It is his uncompromising devotion to the cause of moral values in general and scientific values in particular that has placed him separate and above many eminent scientists and mathematicians.**

Report on the Seminar on "Accountability in Scientific Institutions and Whistle Blowers Protection Actg" held on May 11, 2006 at NPL

The Society for Scientific Values (SSV) in association with the National Physical Laboratory (NPL) and the Human Rights Law Network (HRLN) organised a seminar on 'Accountability in Scientific Institutions and discussion on Corruption & Whistle Blowers Protection Act' on May 11, 2006 at NPL. About sixty scientists from NPL and other institutions and some legal experts associated with HRLN attended the seminar.

The seminar started with a talk by Prof. P.V. Indiresan, former Director IIT Madras, on 'Why West Leads in Technology? How India Can Catch on?'. It was a very appropriate topic for the 'Technology Day' (May 11) which coincided with the day of the seminar. He gave a thought provoking discourse on the issues and parameters that affect the development of technology resulting in the growth of the economy. He pointed out that, over the last five centuries, **it was the sustained R&D in science and technology that resulted in the phenomenal economic growth in the west.** Giving figures regarding the components of growth in USA he showed that the growth has become less and less dependent on land and labour while improvement in the education of workers and increase in the knowledge (through R&D) have become the major contributing factors. Other contributing factors have been – industrial expansion, capital investment and overall better management of resources. In India, although great monuments were built that required exceptionally high technological skills but little effort was made to harness technology and make further developments in it for the economic growth of the society, that is, for the generation of wealth for the common people. In this context **Prof. Indiresan raised the question as to why most of our R&D do not bear fruit? During the discussion that followed he said that an important factor is our lack of courage.**

Dr. Anand Akhila of Central Institute of Medicinal & Aromatic Plants Lucknow (CIMAP) made a detailed presentation to highlight the unethical practices resorted to by some senior scientists who, by virtue of their position, exercise an administrative control over the research work of the institution. **Having made no significant scientific contribution in a particular activity themselves, they grab credit for the work primarily done by their subordinates.** They insist on getting their names included in research publications, patents, technical reports etc just to boost their list of publications. Sometimes the work does not even fall in their field of speciality. A large fraction of these papers are published in the in-house journals without proper refereeing. This tendency on the part of the people in the position of authority causes serious aberrations in the system. The scientists who resist this kind of pressure face discrimination in the allocation of institutional resources – like funds, facilities and promotional avenues. For a serious minded scientist it becomes difficult to concentrate on productive work in the prevailing atmosphere of demoralisation and frustration. In support of his assertions, Dr. Akhila presented data regarding the publications of the present Director of CIMAP and his predecessor for the period of their respective tenures as Directors of the institute. As stated by the speaker the data was based on the annual reports and the website of the institute. In the discussion that followed Dr. P.N. Tiwari, the founder Secretary and present editor of the SSV publication 'News and Views', said that any specific allegation made against any person on the forum of the Society is

not accepted as true without proper verification.

Mr. Colin Gonsalves and Mr. Jai Singh - advocates Supreme Court and members of the HRLN team - made a presentation of the draft of the Whistle Blower's Bill. The objectives of the bill are stated below-

- a) To fight corruption and thereby encourage honest upright citizens of this nation to come forward and make public interest disclosures;
- b) To support the principle of public interest disclosure and safeguard rights of persons who make public interest disclosures including rights guaranteed under the constitution of India;
- c) Provide a framework within which public disclosures will be independently and rigorously dealt with;
- d) Provide a framework within which persons who make a public interest disclosure will be protected.

A lively discussion followed the presentation. The speakers invited the audience to send their comments after going through the contents of the bill, copies of which were circulated during the seminar. The text of the bill

is published in this issue of the bulletin. Senior Supreme Court lawyer - Mr. Prashant Bhushan - gave a talk on the accountability of a scientist to the society. In this context he expressed his views regarding the 'conflict of interest' of senior government functionaries when they get associated with other national and international agencies in some advisory capacity. He also mentioned that some very senior and elderly scientists, who occupy high positions, advocate projects that are highly ambitious but clearly impractical. This tendency has a potential of diverting meagre national resources into fruitless efforts and ultimately leads to frustration in the scientific community.



A view of the Panelists at the Seminar

The seminar concluded with a panel discussion that was chaired by Prof. Pushpa Bhargava, former Director CCMB. Other panellists included Dr. Vasantha Muthuswamy, Deputy Director General ICMR, Prof. P.N. Srivastava, former VC, JNU, Dr. P. N. Tiwari, former Project Director NRL (Pusa Institute), Dr. N. Raghuram, faculty, GGS Indraprastha University, and Dr. U.C. Lavania, scientist CIMAP. They expressed their views and experiences regarding the unethical and corrupt practices prevailing in S&T organisations. They stressed the need to spread awareness in this connection among the scientists and technologists so that such practices are exposed and curbed. At the end, Dr. Indra Mani, Treasurer, SSV presented Momentos to the speakers and panelists.

B.B. Sharma

Talk on Why the West Leads in Technology? How India Can Catch UP? by Prof. P.V. Indiresan, former Director, I.I.T., Chennai

A Report

The Society for Scientific Values (SSV) in association with the National Physical Laboratory and the Human Rights Law Network organised a seminar on 'Accountability in Scientific Institutions' on May 11, 2006 (Technology Day) at NPL, New Delhi. Prof. Indiresan delivered the opening talk of the seminar on the topic 'why the West leads in technology and how India can catch up?'. **He emphasized that the single most important factor in the growth of the economy is the continuous development in technology. He presented the data on the components of growth in USA.**

Components of Growth in the United States

S. No.	Components	Attributes
1.	Land (includes materials)	-04
2.	Labour input except education	-23
3.	Education per worker	30
4.	Economies of scale (Expansion)	20
5.	Increases in knowledge (R&D)	64
6.	Better resource Management	19
7.	Other factors	-20
8.	Capital	10

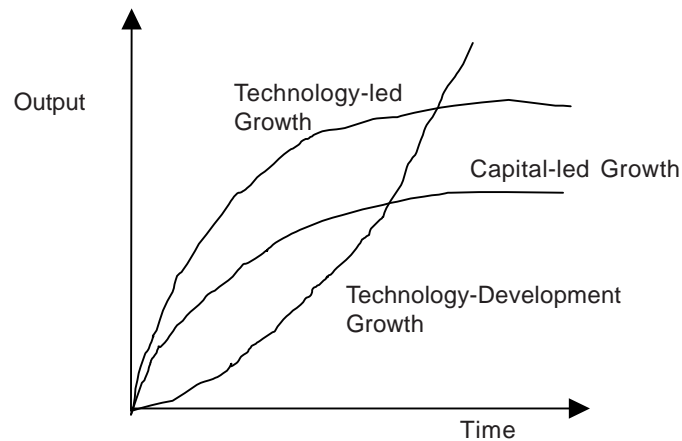
It is seen from the table that the growth has become less and less dependent on Land & Labour while improvement in the knowledge base of workers (through education) and advancement in technology (through R&D) have become the major factors contributing to growth.

He said that the countries that became rich realised the importance of knowledge in the form of education of workers and in technological developments through continuous efforts in R&D. The countries, which could not fully grasp the importance of these factors, lagged behind in wealth generation. He pointed out that, compared to the poor countries, the rich countries do not have more natural resources or skilled manpower. The poor countries have lots of unexplored natural resources and they are, in fact, the exporters of skilled manpower. Similarly the availability of capital is not a problem as the rich countries are only too eager to lend it to the poor countries and the price of the technology is surprisingly low. However, the imported technology is fruitless unless it is backed by sustained R&D efforts indigenously.

He thought that essentially it is the technology culture, so to say, that is lacking in the developing countries like India. He mentioned that we in India built great monuments like the Meenakshi temple and Jantar-Mantar but failed to grasp the importance of the scientific inventions and technological developments those took place elsewhere like the

invention of the telescope for example. The building of monuments and similar other ventures do not directly contribute to the economic growth whereas the scientific inventions and technological developments affect the life of common people and directly contribute to economic growth.

He compared the three routes to economic development, viz, (1) technology-led growth, (2) capital-led growth and (3) technology-development growth. The first one leads to fastest initial growth but saturates quickly, the second one gives comparatively slower growth and saturates at a still lower level, the third route starts with the slowest growth rate but picks up quickly and rises fast to give the highest growth rate. **The time-versus-output curves (schematic) for the three routes are shown in the following figure. The lesson is that the technology development is always an on-going exercise and has to be sustained assiduously to stay in the intensely competitive economic field.**



Prof. Indiresan quoted the Kuhn's six stages of scientific development which have been followed to a large extent in the scientifically and technologically advanced countries and this culture has been responsible for the continued dominance of western science over the past five centuries. These six stages are –

1. Adopt a paradigm with a consistent set of hypotheses.
2. Set up newer and newer puzzles to test the paradigm.
3. Check for anomalies between theory and experiment.
4. Push the paradigm to the limit until it fails.
5. Search for and discover a better paradigm.
6. Discard the old paradigm and re-write textbooks.

Prof. Indiresan raised the question as to why most of our research and development do not bear fruit. In the discussion that followed he said that an important factor is our lack of courage. He further pointed out that because of the very

nature of the technological innovations their half-life is short and is decreasing day by day. The technology must be discarded before it becomes obsolete. As a thumb rule each year at least 20-40% of technology must be retired and replaced by better technology. The researcher also needs very careful and considerate treatment. 'He is like a bird; hold him too tight – he chokes; hold him too loose – he flies away. Protect him from Babus! Every Babu in the Finance Ministry equals a bomb in the hands of the enemy.'

In conclusion Prof. Indiresan quoted Christiansen '**A country that trains its engineers and technologists well then rewards them both with real and psychic income should have little trouble competing in a world economy that thrives on trading high quality hi-tech products over international boundaries**'.

B.B. Sharma



A view of the audience at the Seminar

Science and Technology Education : India's Complacency

P.N. Srivastava

Professor Emeritus & former Vice-Chancellor, Jawaharlal Nehru University, New Delhi
and First Chancellor of Manipur Central University

In an invited article "Science Education in Indian Universities: Shouldn't Someone Be Concerned About It" in the Special Issue of University News on Engineering Education: Vision for a Better Tomorrow" (University News, Vol. 43, No. 39, September 26-October 02, 2005, pp7-12), I have written in detail how education in general and science education in particular has not been taken care of the way it should have been.

India as a nation has never established a knowledge paradigm, as it has not set a development and knowledge milestone for what it wants to be twenty years or thirty years from now. This vision need not be based on the projection of economic, or knowledge growth, instead the knowledge and economic growth should be tailored to reach the milestone set by the nation. **India's economic growth is the result of the policy of liberalization; achieved not by the government but by corporate entrepreneurial competence, sometimes in spite of the government. This did not happen in the field of scientific education, an area that fortunately or unfortunately remained in the domain of the government.** Our institutes of excellence, no doubt, have done well, but if we take a closer look at the graduate-level education, a totally different and frustrating picture appears. . With over 300 universities, we can hardly count about two dozens which have some standards and even adding some mediocre universities, we cannot stretch the number beyond fifty. The Indian express in its editorial (10 December 2005) states, "At the higher end, there is a surfeit of universities and colleges that excel in providing almost worthless education."

When I say about 'knowledge paradigm' or 'development and knowledge milestone', I have in mind the basic question: who do we want to compete with, or follow? We know that we can't in any way compete with the US; we can only be 'an associate' in scientific knowledge development and experiments. But China is different. It has not only become a competitor but an emerging power as well, recognized beyond the limits of Asia. Even without dependable official data on its scientific educational programmes, whatever has come out from the studies of experts and independent observers, it is time for India to take serious note of China's mammoth objectives in the areas of scientific knowledge development.

An objective view of India's development in the realm of higher scientific education should start alarm bells, as progressive growth in the areas of higher sciences, barring a few exceptions, is almost inversely proportional to our economic growth. But the real tragedy that eludes the planners, is that without a steady growth in scientific research and quality higher education, India will have to depend on borrowed knowledge to sustain its growth, which is dicey, if one cares to take note of the serious concern that the US or EU administration had repeatedly expressed, and had commissions set up, to correct, according

to them, the declining trend in their scientific education.

Judging by any set of standards, the performance of Indian Science during the last 60 years or so has been good. The range and scope of problems tackled by Indian scientists come very close to those of the advanced countries such as Germany, France, Canada and Japan. Just 20-25 years back, India, if not ahead, was in no way behind China. Today the story is different. We have become complacent. In terms of publications of the scientific research in the world, India ranked 8th during 1980s, slipped to 13th during 1990s and has nose-dived to 21st position in the new millennium, The rank of India after introducing a measure of “quality”, has dropped to 119 (Science Citation Index). Why should we shy away from facts and try to put them under the carpet with untenable excuses?

Up to 1980s, India’s position was positively comparable to China. No more. Physics has been one of its strong areas in India. The Editor of the prestigious Physical Review Journal of the U. S. A. has commented that China had communicated more than one thousand papers in 2003 for publication in the Journal (Newsweek, October 25 issue, 2004, page 13). Publications in Physics has currently accounted for barely 10 % of the papers with high percentage of citations 42 % (Current Science, Vol. 86, pp. 1194-1195, 2004). Prakash of the Department of Physics, Kurukshetra University had commented in 1999 **“In sixties and seventies in each periodical of Physical Review, there used to be 3 to 4 articles from the authors working in the Indian universities. However in nineties, the number has reduced to 1 to 2. At the same time, there is an increase in the number of articles from the universities like Iran, Turkey, Nigeria and Korea which were non-existent earlier”**.

An internationally renowned mathematician, Robert Langlands, a path -breaker in the 20th century, presently a Visiting Professor at the Tata Institute of Fundamental Research, Bombay has recently (7 April, 2006) remarked **“I think India’s mathematicians in the sixties and seventies had a real presence in the world, everyone knew their names. I fear that’s no longer the case.”** He has further stated that “There are more Indians abroad but their presence internationally is less than it was. I can’t say why”. He has been very polite; I know the reason. The reason is that we have not bothered to take care of our education in the country at all the levels.

What is happening in China?

According to a recent 2004 survey, there is not a single Indian university among the top 100 universities of the world. Not that Chinese fare any better. But a few years back the Chinese have evidently put forward a self-critical list with a view to improving their university system in keeping with their avowed national priority of turning at least hundred of their universities into world-class institutions. If not in hundred they may succeed in at least ten. Alan Goodman, President of the Institute of International Education, a research organization in New York, after an extensive survey (2005) of educational institutions in China has commented on the phenomenon of the pace of change in China, which is spending billions of dollars to expand and transform its higher educational facilities into world- class institutions. This is a real measure of the impact of globalisation”. Fareed Zakaria of the Newsweek (9 January 2006) has made a survey very recently and has

remarked, "Traveling around Asia for most of the past month, I have been struck by the relentless focus on education. China, as always, appears to be moving fastest. When the officials of China talk about their plans for the future growth, they point out that they have increased spending on colleges and universities almost tenfold in the past ten years. Yale University President, Richard Levin, has noted, "Peking University's two state-of-the-art semiconductor fabrication lines – each employing a different technology – outshines anything in the United States".

American Example

No one would deny the fact that United States is at the top of the world as far as science and technology is concerned. During the last five decades, they have won at least 70% of the Nobel Prizes. Still, they are not complacent and are concerned about it. One has only to look into a document brought out recently, "A Nation at Risk", a report presented to the American Congress that stirred the soul of the nation. A knowledge economy woke up to the reality that their very basis, 'knowledge advantage' was disappearing. That set in immediate major reforms in their schools and educational institutions to prepare the young American minds in competencies that gave America their edge over other economies. Just a few weeks back American President Bush announced in his state of the Union address a further grant of \$ 136 billion to boost the science education and research over the next 10 years. In a recent report, the National Academy of Sciences has concluded that Physics in America is at a crossroads and in a crisis. They want that U. S. should be prepared to spend up to half-billion dollars in the next five years to ensure that a giant particle accelerator now being designed by a worldwide consortium of scientists can be built on American soil. Leadership in science remains central to the economic and cultural vitality of the United States. This response is only because a giant linear Hadron Collider machine that would enable physicists to explore 'revolutionary new physics' would start operation at the European Centre for Nuclear Research, CERN, outside Geneva.

European Example

One had only to listen to the address of Tony Blair, President of the European Union delivered to the Heads of the nations recently. At one stage he emphasized that if the Union had to keep pace with the world, more specially U.S.A., China and India, we must strengthen our university education. Jacques Chirac, the French President has recently lamented that in term of Nobel Prizes, publications, patents and science students, Europe is losing ground at an alarming rate. As a consequence, more than twenty groups in physics, biology, chemistry, electrical, mechanical and civil engineering have started interdisciplinary projects. Current projects are focused on applications of Nanostructure Technology and Analytics with excellent infrastructure found in very few places. Various universities are involved on the applications of Information Technology, Material Sciences and Biosensor Engineering

India's Complacency

As against whatever is happening in the world, how complacent and contented are we? We unhesitatingly say, "The locus of Science and Technology is shifting away to

countries like India and China. People are now coming back (to India). According to an estimate during the last three years around 30,000 professionals have come back. Ten years ago about 70% of the IIT graduates used to go out. That has come down to 30% now.” How long will the economy continue to grow without the seed of good education? Good knowledge is a critical input for Indian economy to grow. When we make such statements we forget that multinational and Indian companies have been relocating Indian as well as foreign nationals to India for some time. Earlier, a job in India was considered a risk. Today it is different and for this the Government of India does deserve credit. A survey conducted by Morgan Howard some time back showed about 60% of even senior US executives would be willing to take a C-level position with an Indian company in India. Of course, most would have to be paid in dollars at a level or greater than their current salary. This, no doubt, gives them a much better standard of living in India than they would ever dream of in United States.

In the course of a provocative talk on “Is there room for two, India and China, and the new global economy’ in New Delhi on April 28, 2006, the Editor of Time International, Michael Elliot said that “there are three basic significant impediments to India being spoken in the same breath as China and they are poverty alleviation, infrastructure development and education. In all these areas China had done an extraordinary job”.

The Indian National Science Academy got a document “India Science Report” prepared that had been presented to the Prime Minister only a few months back. The document states “Most developed countries keep a tab on the health of science and technological activities through ‘periodic science reports’. These country reports are important component in restructuring national S & T priorities and have played a large part in funding and monitoring S & T programmes in these countries”. Does this document serve this purpose? **How can any one better the health of any system unless one talks about the diseases that afflict the system?** Under chapter 2, “Education in Science and Engineering” it casually states that “the science education system, as it stands today, needs a drastic makeover for the nation to really derive any competitive advantage”. It has not even devoted a page to substantiate this. The whole document deals with statistics, which would look impressive in numbers since the country has a population of a billion plus. Our attitude is that India is any way developing at the growth rate of seven to eight per cent. So the *chalta hai* attitude continues, why bother about any thing. To us, time is not important.

High time to enact the Whistle Blowers Act

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In less than a year after the gruesome murder of 31-year-old Satyendra Kumar Dubey by the contractor mafia in Gaya, the nation has forgotten the demand for a Whistle Blowers Act triggered by the incident. Dubey, a 1994 civil engineering graduate from IIT Kanpur, was Deputy General Manager in the National Highway Authority of India (NHAI), working on the 60-km Aurangabad-Barachatti segment of the Golden Quadrilateral in Bihar with headquarters in Koderma, Jharkhand. On November 11, 2002, the Prime Minister's Office received his letter addressed to Vajpayee, the then Prime Minister and the founder of the NHAI, alleging rampant corruption. "Since such letters from a common man," Dubey wrote, "are not usually treated with due seriousness, I wish to clarify... that this letter is being written after careful thought by a very concerned citizen who is also very closely linked with the project. I request you to kindly go through my brief particulars (attached to a separate sheet to ensure secrecy) before proceeding further." Not only did the government do nothing concrete to stop corruption, Dubey's request for anonymity was also ignored and his identity was revealed to all concerned as the file moved through Indian bureaucracy's endless orbit for over a year, till he was shot dead by "unidentified assailants" in November 2003. **The incident made national headlines and triggered several demands in the media to enact the Whistle Blowers Act.** Dubey's request for secrecy would have been legally binding, if the Govt enacted a Whistle Blower Act that was already recommended by the Constitution Review Commission in 2002. This would have ensured that Dubey was "protected against retribution and any discrimination for reporting what he **perceived as wrong-doing.**" A designated authority would have probed the complaint without betraying his identity. It would also have been bound to protect Dubey's life and career.

No other incident has brought the demand for a Whistle Blowers Act into such a sharp focus as Dubey's case did and yet, nothing happened and the nation witnesses the harassment and victimization (if not murder) of honest employees almost on a daily basis. What is worse, the tormentors are often within the system, subverting the very core of governance. For example, a few months ago, a Police officer of the Delhi Police committed suicide for his stated inability to cope with his corrupt bosses who were allegedly forcing him to collect his quota of bribes against his conscience to fill their coffers. Even as the nation wondered at this rare case of honesty in the police force, his colleagues proved public cynicism by attempting to silence his family members, rather than fighting for justice or prevention of such incidents.

It is not that corruption is unique to civil works, police, municipalities, defence deals, telecom policies or investment decisions. From school admissions to college affiliations and university degrees, from hospitals and diagnostic centres to forensic labs, from hiring and promotions to firing of employees, from drug testing and approvals to environmental impact assessment, from blood transfusions and organ transplantations to transgenic crops,

there is no sphere of public life, whether in government, NGOs or private enterprises, where public interest is not compromised for money, power or both. Even though we all know that the revelations from media investigations and sting operations are only a tip of the iceberg, reliance on them to root out corruption not only raises questions of journalistic ethics and invites regulations, but also promotes systemic indifference among informed insiders and gives false hopes of solving internal problems through sporadic media intervention. **The only way to stem the rot is to have laws in place that encourage people who have inside information to speak up and to ensure that their interest is adequately protected.**

Witness protection Act is also necessary, but not sufficient to deal with such a deeply rotten system. The question of witnesses protection comes only when witnesses are identified after a prima-facie case is taken up for criminal investigation or judicial proceedings. On the other hand, whistle blowers or people who have credible insider information of a wrong doing, often help at a much earlier stage, in establishing a prima facie case for investigation or in identifying the witnesses. A whistle blower is also often a witness, but all witnesses need not be whistle blowers. In that sense, whistle blower protection provides a broader scope and serves a broader purpose than witness protection, though both are related and complimentary.

Experts define whistle blowing as the disclosure by individuals or employees (former or current) of illegal, immoral or illegitimate practices under the control of their employers, to persons or organizations that may be able to intervene decisively. Whistle blowing may be internal, when the individual reveals such findings to people outside the normal chain of command in the organisation, or external, where individuals go out of the organizational hierarchy and make information available to public or other external authorities to get a positive action. Most often, this requires that whistle blowers have a high level of moral responsibility, guts and concern for the organization and society at large. Trade unions, opposition parties and social activists are also whistle blowers in this context and whistle blowing is considered an essential part of their effective functioning. However, individual whistle blowers who may not have such a back up often leave the organization or face employer or coworker retaliation, unless they are protected by law.

Law can become handy for the whistle blowers and help prevent their sufferings to some extent. For example, in the US, Whistleblowers Protect Act of 1989 protects federal employees who make public interest disclosures. Also the fall of Enron and WorldCom initiated the Sarbanes-Oxley Act of 2002 which gives high degree of protection to the whistle blowers of publicly traded companies. There are also demands in the US to make whistle blower protection even stronger and give more teeth for the effective implementation of the act. **However, in India, there are no legislations to protect the interests of whistle Blowers despite recommendations by the Constitution Review Commission in 2002.** A culture of Openness by which the employees and individuals are given freedom and support to point out corrupt practices in the organizations would help to prevent the humiliating falls as happened in the case of Enron or WorldCom.

The guts and high moral responsibility of whistle blowers shows that whistle blowers

can play a vital role in fighting loose ethics and slack corporate governance. Ironically, they have to undergo insult and injury in form of job loss, ridiculing, retaliation and boycott. However an important aspect here would be the tolerance of the society towards corruption and unfair practices. **In the Indian context it is of high importance that organizations take a serious view of instilling high sense of ethics and laws are formulated to protect the employees who play the role of whistle blowers against corruption both in the private and public sector.**

Some cases of whistle blowing

1. Sherron Watkins opened up the accounting scandal at Enron. Watkins was concerned about the fraud accounting practices and the partnership between the CEO, CFO and other executives who were duping the company. Watkins, knowing that informing the CFO who happened to be her boss about the wrong practices would be a job terminating move, approached the Chairman to voice her concern. As Watkins puts it, "CEO Jeffrey Skilling, Fastow and other executives "did dupe Ken Lay and the board," she said. "Mr. Skilling and Mr. Fastow (CFO) are highly intimidating. I think they intimidated a number of people into accepting" the partnerships (CNN). The initial response of the Chairman was just to ask an agency to make an enquiry and in response CFO demanded for firing Watson and seizing her computer. Before Enron finally filed for bankruptcy, Watson again informed the Chairman about the pathetic state of affairs at Enron. Lay ignored the advice of Watson and paved way for one of the most humiliating falls. Watson quit the job after the scandal and believes that some of her colleagues still hate her as they believe that if the organization was given enough time it would have corrected the mistakes by itself. Ironically, as the Time reports, the notepads of Enron, had the inspiring quote of Martin Luther King Jr, which reads "Our lives begin to end the day we become silent about things that matter." !
2. A few years ago, Prof. Kavita Pandey, Head, Physics Department, Kumaon University brought to the attention of the Society for Scientific Values (SSV, the only organisation of its kind in India), and a number of prominent particle physicists in India and abroad that Prof Rajput, a former Head of the same department and the then Vice Chancellor of the University, in co-authorship with his research students have indulged in serious unethical practices of plagiarisation of published research papers of others, as also of publishing same/similar papers in more than one journal. 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 (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 set up an enquiry committee under the Chair of a retired Judge, who established the guilt and Prof. Rajput has eventually been replaced as the VC of Kumaon university recently. However, during the intervening period, Prof. Kavita Pandey suffered retaliatory action, including harassment and removal from headship, till it was reversed by the new

VC. Despite its best efforts and intentions, the SSV could not prevent her harassment. A Whistle Blowers Protection Act would not only help such people, but also organisations such as the Society for Scientific Values in fulfilling their objectives.

3. In 1997, Scientists and employees of National Institute for Science Communication (NISCOM, an autonomous CSIR institute funded by GOI), Delhi, went on strike against their director. Among other things, they were protesting against the harassment of scientists who resisted his illegal transfer of CSIR copyrighted information from printed versions of "Wealth of India" into a private CD ROM for sale. The director eventually lost his job, but not before a few scientists faced retaliatory action for being in the forefront of the agitation. They are still under suspension, and the payment of partial salary as an interim relief with judicial intervention could hardly undo the damage done to their career and reputation. A whistle blower's Act, if it existed and applied properly, could have given them some protection from retaliation.
4. In 1995, there was a bizarre case of four research scholars who were effectively fired from Jawaharlal Nehru University for reacting against the wilful sabotage of an experiment. The victim, whose experiment was spoiled, the accused and the sole eyewitness to the tampering act, all three belonged to the same lab in the School of Life Sciences. The professor who headed that lab sought to protect the accused, which led the victim and the eyewitness to blow the whistle in public. Even as the students and research scholars agitated to punish the guilty, faculty retaliation led to the exit of the victim, the witness and two other research scholars who led the agitation. Even though the witness was eventually brought back and a subsequent enquiry by a professor from the School of Law vindicated the students' stance and established the guilt of the accused, the faculty of School of Life Sciences helped the guilty scholar to escape punishment and re-establish his career elsewhere. The victim never completed her Ph.D., and the witness and two other scholars who stood up for her suffered tremendous retribution and damage to their careers. Such damage would have been prevented, at least partially, if they enjoyed whistle blowers' protection.

Whistleblowers Bill, 2006 - Nature of the Act

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1. Short title

This Act may be called as the Whistleblowers Bill, 2006.

2. Commencement

Section 1 and this section commence on the day on which this Act receives the assent of the Parliament.

3. Objects of this Act

The objects of this Act are to :

- (a) **To fight corruption and thereby encourage honest upright citizens of this nation to come forward and make public interest disclosures.**
- (b) **To support the principle of public interest disclosure and safeguard rights of persons who make public interest disclosures including rights guaranteed under the constitution of India.**
- (c) **Provide a framework within which public interest disclosures will be independently and rigorously dealt with.**
- (d) **Provide a framework within which persons who make a public interest disclosure will be protected.**

4. Act generally binding

This Act binds all persons inter alia working in or a member of a public, private and semi-private concerns or any other organization. In other words, this act covers every individual(s) who is/are working in a public company, private company, joint venture of a government and a private company, or any other organization. This Act also covers disclosures made against any foreign/international organizations provided that the same is in public interest.

Interpretation

5. Definitions

A company means a company formed and registered under the companies act of 1956.

Confidential information means :

- (a) Information about the identity, occupation or whereabouts of a person who has made a public interest disclosure or against whom a public interest disclosure has been made; or
- (b) information contained in a public interest disclosure; or
- (c) information concerning an individuals personal affairs; or
- (d) information that, if disclosed, may cause detriment to a person.

Damages refers either to the harm suffered by a Whistleblower as a result of making

the public interest disclosure, or to the money paid or awarded to the Whistleblower in compensation for such harm suffered by him.

Conduct is to be taken to be disclosable if :

- (a) It is of a type referred to in subsection(2); and
- (b) it would, if proven, constitute :
 - (i) a criminal offence; or
 - (ii) an offence relating to public health and safety; or
 - (iii) an offence relating to environment; or
 - (iv) an offence relating to public wastage; or
 - (v) any other offence that is or would be or is likely to be detrimental to public interest.

For purposes of sub-section (a), the following types of conduct are disclosable:

- (a) conduct of a person that adversely affects, or could adversely affect, either directly or indirectly, the honest or impartial performance of official functions by a person;
- (b) conduct of a person which amounts to the performance of any of his or her official functions dishonestly or with partiality;
- (c) conduct of a person, including a former employee or an agency that amounts to a breach of public trust.
- (d) conduct of a public official, a former public official or an agency that amounts to the misuse of information or material acquired in the course of the performance of official functions (whether for the benefit of that person or agency or otherwise).
- (e) conduct of a public official of a kind that amounts to mal-administration which is action or inaction of a serious nature that is
 - (i) contrary to law; or
 - (ii) unreasonable, unjust, oppressive or improperly discriminatory; or
 - (iii) based wholly or partly on improper motives;
- (f) a conspiracy or attempt to engage in conduct referred to in paragraphs (a) to (e) inclusive).

A joint venture (often abbreviated JV) is a strategic alliance between two or more parties to undertake economic activity together.

An organisation is a formal group of people with one or more shared goals.

Persons mean a human being or a corporation treated as having the rights and obligations of a person.

Private would be something of someone's own personal importance or something which would affect one's individual life or right to life.

A private company as defined by the Companies Act, 1956 is a company which has a minimum paid up capital of 1 lakh rupees or a higher amount as fixed by the articles, restricts the right to transfer shares if any, has maximum of 50 members, does not invite the public for any investment in the form of buying the shares or debentures of a company.

Public is of or pertaining to the people; belonging to the people; relating to, or affecting, a nation, state, or community; opposed to private. Public herein also includes the people of a nation not affiliated with the government of that nation.

A public company as defined by the Companies Act, 1956 such a company that is not a private company, has a minimum paid up capital of 5 lakh rupees or more as fixed by

the articles, is a private company which is a subsidiary of a company which is not a private company.

A public interest disclosure means a disclosure of information that the person making the disclosure believes on reasonable grounds tends to show.

- (a) that another person has engaged, is engaging or proposes to engage, in disclosable conduct; or
- (b) public wastage; or
- (c) conduct involving substantial risk to the environment; or
- (d) conduct involving substantial risk to public health; or
- (e) that a person has engaged, is engaging or proposes to engage, in an unlawful reprisal.
- (f) any other conduct that is or would be or is likely to be detrimental to public interest.

Public wastage means conduct by a public official that amounts to negligent, incompetent or inefficient management within, or of, an agency resulting, or likely to result, directly or indirectly, in a substantial waste of public funds, other than conduct necessary to give effect to a law of the State.

A semi-private concern is a concern, which is neither completely public nor completely private but has clashing interests of both the organs and its work affects both.

A tort is a civil wrong for which the remedy is damages or compensation and for which civil proceedings may be carried out.

An unlawful reprisal means a conduct that causes, or threatens to cause, detriment;

- (a) to a person directly because a person has made, or may make, a public interest disclosure; or
- (b) to a person directly because he or she has resisted attempts by another person to involve him or her in the commission of an offence.

A Whistleblower is a person who makes a public interest disclosure reporting misconduct to the concerned authority as provided by the Act.

Disclosures

6. Public Interest disclosure

1. Any person may make a public interest disclosure to an appropriate authority.
2. Without limiting the generality of subsection (1) a person may make a public interest disclosure if he feels:
 - (a) that a criminal offence has been committed, is being committed or is likely to be committed,
 - (b) that a person has failed, is failing or is likely to fail to comply with any legal obligation to which he is subject.
 - (c) that a miscarriage of justice has occurred, is occurring or is likely to occur.
 - (d) that the health or safety of any individual has been, is being or is likely to be endangered.
 - (e) that the environment has been, is being or is likely to be damaged, or
 - (f) that information tending to show any matter falling within any one of the preceding paragraphs has been, is being or is likely to be deliberately concealed.
3. Such disclosures are to be entertained which if not made would result in mass damage to the public interest.

4. the disclosures so made should not be out of personal vendetta.
5. The disclosure of information can be made by an employee of any organisation, it may be private or it may be public or could be a joint venture as well, but the disclosure of information should always be in the interest of the public.

Procedure and Reporting

7. Procedure for making Public Interest Disclosure before the appropriate authority.

1. The State Government may, by notification in Official Gazette, constitute for every state, specified in the notification, an appropriate authority for exercising the powers and discharge the duties conferred on such authorities in relation to public disclosures made by whistleblowers and for the protection of the whistleblower under this Act.
2. The Authority shall consist of a Chairperson and four other members as the State Government may think fit to appoint, who shall be experts on matters concerning whistleblowers.
3. The qualifications of the Chairperson and the members, and the tenure for which they may be appointed shall be such as may be prescribed.
4. The appointment of any member of the committee may be terminated, after holding inquiry, by the State Government, if -
 - i. he has been found guilty of misuse of power vested under this Act;
 - ii. he has been convicted of an offence involving moral turpitude, and such conviction has not been reversed or he has not been granted full pardon in respect of such offence;
 - iii. he fails to attend the proceedings of the Committee for consecutive three months without any valid reason or he fails to attend less than three-fourth of the sittings in a year.
5. The Committee shall function as a Bench of Magistrates and shall have the powers conferred by the Code of Criminal Procedure, 1973 (2 or 1974) on a Metropolitan Magistrate or, as the case may be, a judicial Magistrate of the first class.
Any appeal against the findings of the said authority will be made in the High Court or the Supreme Court and the matter should be heard within three days of filing of the appeal.
6. for the purpose of section 7:
 - (1) Before being nominated as members of the Authority the members including the chairperson shall fully disclose all their assets.
 - (2) The Authority shall investigate into the public interest disclosure within 60 days of making the public interest disclosure.
 - (3) Upon completion, if the appropriate authority finds that the disclosure made is true and correct, the authority shall have the power to immediately provide protection to the whistleblower and the family of the whistle blower.

8. Progress report

1. A person who makes a public interest disclosure to the Authority may request the Authority to which the disclosure was made or referred to provide a progress report.
2. Where a request is made under subsection (1), the proper authority to which it is made shall provide a progress report to the person or authority who requested it :
 - (a) as soon as practicable after receipt of the request; and

- (b) if the Authority takes further action with respect to the disclosure after providing a progress report under paragraph (a);
 - (i) while the authority is taking action - at least once in every 20 days period commencing on the date of providing of the report under paragraph (a); and
 - (ii) on completion of the action
- 3. A progress report provided under subsection (2) must contain the following particulars with respect to the proper authority that provides the report:
 - (a) where the authority has declined to act on the public interest disclosure - that it has declined to act and the ground on which it so declined;
 - (b) where the authority has referred the public interest disclosure to an independent investigating agency - that it has referred the disclosure to an independent investigating agency and the name of the agency to which the disclosure has been referred;
 - (c) where the authority has accepted the public interest disclosure for investigation - the current status of the investigation;
 - (d) where the authority has accepted the public interest disclosure for investigation and the investigation is complete - its findings and any action it has taken or proposes to take as a result of its findings.
- 4. Nothing in this section prevents the Authority from providing a progress report in accordance with subsection (3) to a person who may make a request under subsection (1)

Protection offered by the Act

9. Protection of Public Interest Disclosure and persons making the public interest disclosure :

Liability

- 1. A person is not liable, civilly, criminally or under an administrative process, for making a public interest disclosure.
- 2. Without limiting subsection (1) -
 - (a) in a proceeding for defamation the person has a defence of absolute privilege for publishing the disclosure information; and
 - (b) if the person would otherwise be required to maintain confidentiality about the disclosed information under an Act, oath, rule of law or practice or policy the person -
 - (i) does not contravene the Act, oath, rule of law or practice or policy for making the disclosure; and
 - (ii) is not liable to disciplinary action for making the disclosure.
- 3. This section requires that the inquiry is not to be open to public and that the names of the persons making the disclosure and of the person(s) named in the disclosure shall not be disclosed to the public.
- 4. **Police Protection**

The whistleblower and his family shall be entitled to police protection if the disclosure is of such nature that the disclosure may cause or is likely to cause harm to the Whistleblowers life or property.

For the purpose of the above section it is necessary that the police assigned with the

above mentioned responsibility shall be officers specifically trained in the issue of whistleblowers. Persons who are experts in the field of whistleblowers will conduct the training.

Provided that prior to assigning the above mentioned task the concerned police officers shall fully disclose their assets to the members of the appropriate authority.

5. Relocation of employees

1. Subject to sections 10 and 11 this section gives a right to appeal for the relocation of the Whistleblower.
2. The appeal must be made on the ground that:
 - (a) it is likely a reprisal will be taken against the Whistleblower if he continues in the existing work location; and
 - (b) the only practical way to remove or substantially remove the danger is to relocate the Whistleblower.
3. The appeal may be made to the Authority by the Whistleblower.

Discrimination

10. Discrimination against Whistleblowers prohibited

It shall be unlawful for any person to discharge, demote suspend, reprimand, or take any other action that in any manner discriminates against any Whistleblower, or to threaten or recommend the discharge, demotion, suspension, reprimand or other any other action that in any manner discriminates against any Whistleblower.

Reprisals

11. Reprisal-unlawful and grounds for reprisal

1. A person must not cause, or attempt or conspire to cause, detriment to another person because or in the belief that, anybody has made, or may make a public interest disclosure.
2. An attempt to cause detriment includes an attempt to induce a person to cause detriment.
3. A contravention of subsection (1) is a reprisal or the taking of a reprisal.
4. A ground mentioned in subsection (1) as the ground for a reprisal is the unlawful ground for the reprisal.
5. For the contravention to happen, it is sufficient if the unlawful ground is a substantial ground for the act or omission that is the reprisal, even if there is another ground for the act or omission.

11.A. Damages entitlement for reprisal

1. A reprisal is a tort and a person who takes a reprisal is liable in damages to anyone who suffers detriment as a result.
2. Any appropriate remedy that may be granted by the authority for a tort may be granted by the Authority for the taking of a reprisal.

11B. Application for injunction or order

An application for an injunction may be filed either before the district Court or High Court or the Supreme Court:

- (a) by a person claiming that he is/she is suffering or may suffer detriment from an unlawful reprisal; or
- (b) by the Authority on behalf of a person referred to in paragraph (a).

Disclosures have to be confidential

12. Confidentiality

1. The Authority will not willfully disclose to any person, confidential information gained through the Authorities involvement in the administration of this Act.
2. Subsection (1) does not apply to a member of the Authority who makes a record of, or discloses, confidential information for the purposes of a proceeding in a court or tribunal.

Provided that subject to the conditions laid down in section 20 sub-section 2, if any disclosure is made to any person other than the person making the disclosure, during the investigation carried out in respect to the Public interest disclosure, the members of the Authority, including the Chairperson shall be criminally liable for breach of (professional code of conduct or trust) and the principle of Strict Liability shall be applicable.

Liability of the persons making the disclosures

13. Limitation of liability

1. A person is not subject to any liability for making a public interest disclosure or providing any further information in relation to the disclosure to a proper authority investigating it, and no action, claim or demand may be taken or made of or against the person for making the disclosure or providing the further information.
2. without limiting subsection (1), a person:
 - (a) does not commit an offence under a provision of an Act which imposes a duty to maintain confidentiality with respect to a matter; and
 - (b) does not breach an obligation by way of oath or rule of law or practice requiring him or her to maintain confidentiality with respect to a matter; by reason only that the person has made a public interest disclosure with respect to that matter to a proper authority.
3. Without limiting subsection (1), in proceedings for defamation there is a defence of absolute privilege in respect of the making of a public interest disclosure, or the provision of further information in relation to a public interest disclosure to a proper authority.

4. Liability of person disclosing

A person's liability for his or her own conduct is not affected by the person's disclosure of that conduct in a public interest disclosure.

**Executive Council of SSV
(August 1, 2005 - July 31, 2008)**

President	K.L. Chopra (Former Director, IIT Kharagpur)
Vice-President	Vikram Kumar (Director, NPL)
Secretary	Nandula Raghuram (Faculty, GGS Indraprastha University, Delhi)
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Special Invitees	P.N. Srivastava (Former member, Planning Commission & Former VC, JNU, New Delhi) A.R. Verma (Former Director, NPL, New Delhi)

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 appear 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, mathematic 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.