Scientists and responsibility

The editorial in *Current Science* (2002, **82**, 5–6) addresses a serious problem regarding the future of science in India. If a survey similar to the one conducted in Europe is conducted in our country, no one will suggest science as a profession of high esteem. The culprits are scientists themselves. In our country scientists consider themselves as superior and try to live in isolation due to the fear that their knowledge will be assessed by the common man. Their 'dream world' consists of attending seminars, publishing papers and exploiting research students. They usually do not pay attention to what a common man has to say. This becomes evident during National Technology Day celebrations when the common man is invited to present his innovations. During the various sessions the scientists pose questions to these ordinary people, to substantiate their invention with scientific evidence. The poor man may not be able to explain, and he may not be required to do so, and ultimately he curses the scientific community for not appreciating his invention.

Most funding agencies in spite of having excess fund, fail to attract youngsters into the research. The culprits here also are the scientists as they lack the sincerity of teachers. These scientists hinder a student's independent manner of thinking. There are people who, even in this 21st century, compel a student to follow old traditional ways of research. Students are compartmentalized in the same department itself. They are not allowed to mingle with students working with other scientists. The ultimate result is that the scientist is creating a second generation of incompetent scholars. Only a few 'favourite' students are allowed to submit their theses early. Others have to work for a minimum of 5–6 years. What is the advantage of getting a Ph D degree late in life when no government institution will take them as employees? Students are also not allowed to attend seminars or training programmes conducted in various parts of the country. For the scientist, it is waste of precious time for research. Scientists are ignoring the fact that only when students mingle, they will get a clear picture of various research activities being carried out in our country.

If science is to be accepted by society, the following measures should be taken up soon:

1. Scientists should come out of their 'dream world' and mingle with the society. They should meet local people and address the student community occasionally.
2. Senior scientists must respect the aspirations of their junior colleagues and students.
3. Scientists should discuss the progress of various research activities undertaken by them with the scientific community and with the public through mass media.

Scientists should realize that they cannot achieve anything without public support and student support. They should win over these two sections, if they really want to gain respect in the society.

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The threat of human-induced climate change cannot be ignored

The recent editorial portrayed an interesting and entertaining debate on environmental issues (*Curr. Sci.*, 2002, **82**, 373–374) and it concluded precisely by pointing out the environmental problems facing our planet today. One of the serious concerns of our time is human-induced global warming, a complex issue that stands somewhere between cloning and nuclear weapons. *El Niño*, the Spanish syllable that spells climate mayhem, is popular now and it occurs when the eastern Pacific Ocean becomes unusually warm resulting in changes in weather around the world. The opposite effect, that cools the water below normal, affecting air patterns and weather is known as *La Niña*. *El Niños* have occurred more often in recent years with an unusually prolonged event from 1990 to 1995 (ref. 1). In fact, severe *El Niños* were known to cause almost all drastic droughts in the recorded history of the oriental region. About 50 million people died in India as a result of the drought that occurred between 1877 and 1879.

One of the earliest whistle-blowers of climate change was Hugh Cleghorn, India's first Inspector-General of Forests. Although he reported on the dangers of environmental degradation leading to climate change to the British Association for the Advancement of Science in 1851 (ref. 2), it was not until the 1970s when the United Nations organized a series of conferences to discuss topics ranging from water crisis, desertification, human settlement and sustainable development, that environmental conservation awareness really began to spread. We are already facing the consequence of environmental degradation in terms of monetary loss; the economic toll of natural disasters during the 1990s peaked to $608 billion, more than the previous four decades combined. Furthermore, a recent press

release by the UNEP predicts that the financial losses related to global climate change could top $304 billion per year in the future.

The atmospheric concentrations of CO_2 in 1997 climbed to 364 ppm, the highest in human history. Since 1950, about 217 billion tons of carbon have been released to the atmosphere. Perhaps as a consequence, Antarctica has warmed at more than twice the average global rate during the last 50 years, causing five of the continent's ice shelves to disintegrate[3].

So also, 27% of the world's coral reefs were severely damaged by late 2000; the figure was only 10% during 1992 (ref. 4). A few degrees Celsius increase in temperature may irreversibly harm the microscopic organisms that live in the tissues of corals.

The Kyoto treaty signed by 161 member countries of UN in December 1997 mandated an average cut of 5.2% in the emissions blamed for warming of the planet. Despite the fact that India increased its emission to 28% between 1990 and 1995, the per capita output is still less than one-tenth that of USA.

Continued degradation of forest aggravates the already precarious state of the remaining forests in Asia. The diversity of plants and animals is declining, carbon emission is above the earth's carbon-fixing capacity, and the human population pressure is exceeding the population of all species of non-human primates combined. Thus human survival depends only on the future 'wise' and 'ethical' management of our natural resources. But the faster the world leaders act to preserve the existing biodiversity resources and also to reduce emissions of gases blamed for trapping the earth's heat, the easier it will be to mitigate what lies ahead.

1. Trenberth, K. and Hoar, T., *Geophys. Res. Lett.*, 1997, **24**, 3057.
2. Grove, R. H., *Ecology, Climate and Empire*, Oxford University Press, Delhi, 1998.
3. Vaughan, D. G. and Doake, C. S. M., *Nature*, 1996, **379**, 328–331.
4. Wilkinson, C., *Status of Coral Reefs of the World*, Australian Institute of Marine Science, web version, 2000.

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Summer approaches – Digging for water recharging points

In recent times, digging of water pits appears to be common practice during summer everywhere, the pits act as recharge points in the subsequent monsoon, as they allow percolation and recharge the groundwater. The pits are one type of rainwater harvesting techniques in the management programme of water resources.

The success of recharge points depends on the thickness of water-bearing zones, such as weathered (shallow, mostly confined to dugwell structures) and fractured (deeper, mostly confined to borewell structures) zones, especially in the rocky region, which constitutes two-thirds of the country. The thicker the water-bearing zones, the greater is the possibility of water to move from place to place, as well as to store groundwater. In the rocky-terrain, identification of such formations is beset with problems, because of its heterogeneity in the horizontal and vertical distributions. Hence, groundwater occurs in less quantity in the rocky terrain compared to the non-rocky region (a mixture of sand, gravel, pebble, etc.), which has sufficient porosity characteristics to hold substantial quantities of water.

Digging of pits without identification of the location of water-bearing zones would not give any significant result in improvement of groundwater recharge, especially in the rocky terrain. Hence failures are common. Therefore, the first priority should be given to identification of the location of water-bearing formations to augment the groundwater recharge. After digging the water pits in the location of water-bearing zones, the temporarily stored rainwater in the pits reaches the saturated zone permanently, resulting in rise in the groundwater levels.

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