



EDUCATION AND SOCIETY

Curriculum / Priya Shah

The Road Not Taken

The authors of our science curriculum express a criminal conceit that nature is to be entirely harnessed for human purposes. Attempts to incorporate a more holistic world-view in schools can no longer remain the effort of a small minority.

The Indian ideal of progress has been fashioned after the western world-view of technological development. From Pandit Nehru to the present government, our planners have viewed large-scale application of technology as the ultimate goal. Our national policy-makers continue to pursue the target of 'development at all costs.' Regardless of the fact that, in the pursuit of economic development, the developed nations have all but exhausted their natural resources. They have cut down their natural forest cover or replaced it with fast-growing monocultures that destroy the soil, polluted their water and air, destroyed the habitat of thousands of species, contributed to global warming and begun to destroy the ozone layer.

The modernistic world-view has so far prevented us from understanding our relationship with the world we live in and adapting to it to ensure our survival. Although the quest for scientific knowledge is not in itself detrimental to the environment, humankind has used that knowledge to control nature and exploit our natural resources to the point that it has made our planet less habitable. The irony of it is that by destroying the biosphere's equilibrium it is humankind, not nature, that will cease to exist. As Dr. Chitra Natarajan of the Homi Bhabha Centre for Science Education puts it, "Nature will find its balance. It is up to us to decide whether or not we want to be part of that balance."

Our modern view of the world is adopted from the idea that all benefits enjoyed by humankind are derived from the man-made world which is the product of science, technology industry and economic development. The immeasurable benefits provided by the normal functioning of the biosphere- such as a favourable and stable climate, fertile soil and fresh water, which are indispensable for life on this planet- are totally ignored and are assigned no value of any kind. The world-view of modernism also re-

quires that in order to maximise all benefits, we must maximise and venerate economic development.

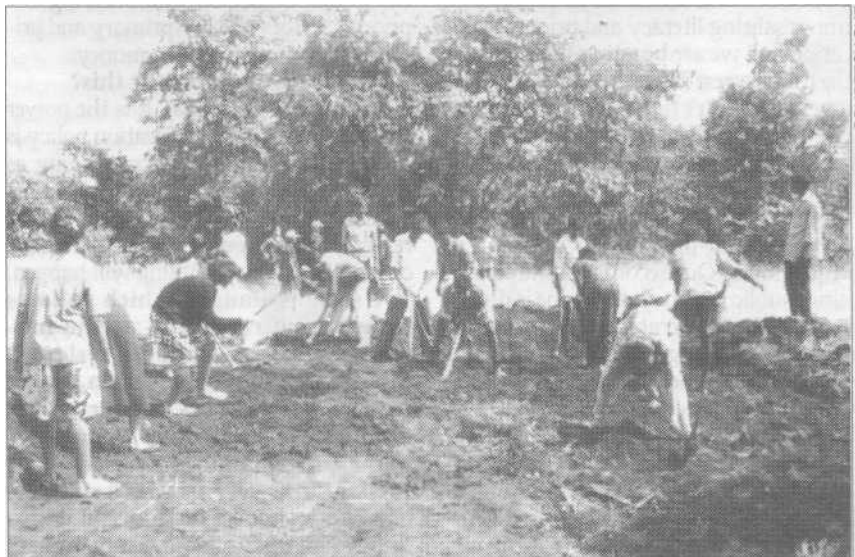
Scientists and academics, like most people, accept this world-view as normal because it rationalises the policies that produced the world in which they, and indeed all of us, have been brought up. It simply does not occur to them that what they take to be normal is in reality very atypical, considering humanity's short-lived and aberrant experience on this planet. For instance, our agricultural science is based on the assumption that large-scale, mechanised, chemical-based agriculture (which rapidly transforms arable land into desert) is normal.

It is blasphemous to suggest that modern methods of "progress" might not be entirely beneficial. To show that the modernisation of agriculture in the Third World is the main cause of malnutrition and famine in those countries; or that modern medicine has failed to prevent an increase in the global incidence of just about every disease except for smallpox is unthinkable for mainstream scientists.

The general tendency to regard the only

world we know, as normal is reflected in the disciplines that are taught in our schools and universities and in the cursory treatment given to ecological principles in the present science curriculum. The underlying theme of the science curriculum reinforces the tenet of modernism, i.e. the indiscriminate exploitation of natural resources to meet humankind's ever-growing demands for food and comfort.

The authors allude that for an object or a process to be of interest to science, it must be of some use to humankind. This attitude does nothing to instill in impressionable minds, an appreciation of the collective importance of all lifeforms and natural processes towards the preservation of life. The idea that an object's 'usefulness' to humankind is a measure of its value is reiterated throughout the curriculum, whether in reference to plants, animals, micro-organisms or even minerals. Those who frame the syllabus make little attempt to depict the role of an object as more than a commodity devised for the sole purpose of fulfilling man's needs, or to decipher its role in the scheme



A different kind of science lesson.

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of things. Even when attempted, it is often confined to a single chapter.

Presumably, the writers believe that the parts of the whole, i.e. the plants, animals and other organisms, can somehow be considered in isolation to the whole, or the biosphere. For instance, while discussing the uses of plants for food, medicine and other human requirements, the writers make no mention of their contribution towards the establishment and preservation of life as we know it, their vital function as the 'lungs of the earth' or in providing a habitat for millions of species.

The curriculum, in elucidating scientific principles, conforms to science's reductionistic and mechanistic paradigm without accommodating the Gaian assumption that the world is a living entity rather than a dead and machine-like system. It serves only to intensify the compartmentalisation of knowledge that has made it possible for science to view life processes in isolation, apparently subject to laws of their own. However, the biosphere and the laws of Nature do not conform to the arbitrary and artificial divisions into which knowledge has been divided.

There is no doubt that it is the isolationist, laboratory method of science that has contributed to its success in elucidating the workings of the natural world. Nevertheless, there is a degree to which we can narrow our focus without losing sight of the big picture. The present range of academic knowledge is forced to fit an atomised and mechanistic world in which people are no more than machines, their needs purely material and technological. This lends itself to the construction of totally aberrant theories. It ignores the complexity of the natural world and the delicate and vulnerable associations that interconnect all natural processes.

The present science curriculum reflects this ignorance. There are few references, often amounting to little more than a footnote, about the vast and complex interactions in the biosphere and their importance towards the creation and nurturing of life as we know it. Even these are usually referred to only when explaining the effect of human activity on the environment. The writers make no attempt to impart a respect for the environment or for the living creatures with whom we share our environment and on whom we depend for our existence. The curriculum also fails to incorporate many well-established facts, such as the dan-

gers of pesticides to human and animal life, and the fact that, as yet, there exists no safe and satisfactory method of garbage disposal. It also informs us that cutting down trees is fine as long as we plant more trees, preferably fast-growing varieties for energy plantations, in their place. It clearly ignores the effects of loss of habitat and biodiversity caused by monocultures and plantations. The curriculum also stresses the importance of using animals for medical research as "subjects to test the efficacy of new medicines."

In failing to mention the humane alternatives to animal experimentation, and in asserting the fallacy that humans are the "only thinking creatures", the edu-

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cationists reveal a lack of respect for other forms of life and an ignorance of established scientific facts.

For too long we have tried to rationalise our unsustainable practices by accommodating our values to fit our lifestyle; by accepting that progress as we practise it, is normal. In doing so, we have ignored the ecological imbalance caused by Man's effort to improve his levels of comfort without regard for the burden it puts on the ecosystem. It is time we returned to a value-based system that embraces a holistic world-view as its philosophy and adapt our lifestyle to live in harmony with nature and with our fellow creatures.

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which a child can identify. Hence, though the content is important, the strategy adopted for imparting education is even more important.

The development of a syllabus that integrates a holistic world-view with a realistic and problem-solving approach to teaching science is essential. It will enable us to instill in young, receptive minds the ability to work towards solutions logically and construct for themselves an integrated vision of their environment. Parisar Asha, an NGO involved in coordinating the Environmental Studies Approach to Learning (ESAL) in several schools in Mumbai, Goa, Pune and other parts of Maharashtra aims to do just this.

The organisation's goal is to help replace rote-learning and its attendant evils through a reality-oriented, problem-solving approach to learning by using the environment (natural and man-made) as a learning resource. It also endeavours to focus attention on attitudes and values that grow from the respect for the interdependence between humankind and the environment. Gloria de Souza, director and founder of Parisar Asha, believes that NGOs can play a collaborative role between the policy makers and the schools. Parisar Asha has been active in trying to develop worksheets and learning materials that

supplement the information in the textbooks of all subjects. They hope to be able to supplement and reinforce learning methods that are integrated and fruitful and to go beyond the syllabus to provide students with information relevant to their everyday experience. They also endeavour to create non-traditional material for ecological sensitisation in certain clusters of inner-city schools. As Priti de Souza, a secondary school teacher says, "Children have the desire to learn subjects from a realistic perspective. We have to teach them how academic facts can be applied to real-life situations." She highlights the lack of ability in students to integrate concepts of temperature and pressure, as taught in the science curriculum, with similar concepts, such as pressure belts in geography.

The growing concern over the erosion of values in society has emphasised the need for adjustments in the curriculum that allow education to become a tool for the cultivation of social and ethical values. In this context, it is important to design literature for children that imparts values that draw upon our nation's rich cultural heritage, based on a synthesis of

Contd. on page 28

Contd. from page 25

science and philosophy. Values fostered through education should be oriented towards national unity and social integration. We must rethink and redefine our march toward development. The onus of implementing programmes and lending them credibility rests ultimately on us adults as role models. In the words of Mahatma Gandhi, "We must be the change we want to see in the world."

The Centre for Human Ecology (CHE), an independent NGO, conducts a highly successful programme in a school in Mumbai, that goes beyond classroom learning. The content of these programmes is centred on an interdisciplinary plane, touching the natural, social and techno-scientific aspects of learning on a broad spectrum. The programme's hands-on approach covers activities such as recycling of school waste paper, garbage separation and composting of organic waste, developing low-cost and nutritive diets, and educating fellow students about the environment. CHE also organises environmental study camps in tribal areas, where the students and tribals learn from an information exchange. The students demonstrate to the tribals the methods of composting, wasteland development and impart information on health and nutrition, while the tribals share with them their knowledge of local medicinal plants.

Says Benson George, co-ordinator of CHE, "The idea is to make the environment the medium of education." The programme also aims at promoting active involvement and participation of pupils and teachers in social and environmental issues. An activity designed to enable teachers to make the correlations between concepts in disciplines as seemingly varied as history, geography, language, maths and science, is to make them perform the exercise of tabulating the associations between different chapters in the same subject as well as those between different subjects. This enables them to lay stress on the process of learning than on mere accumulation and dissemination of information. Allowing the environment to become the teacher enables the student to evolve appropriate thinking, perspective and values, and to relate information to the practical problems faced by the community.

The authors of the science syllabus should incorporate the example set by such alternative methods of education, to make the study of science in schools more relevant to our everyday existence and incorporate a holistic and ecologically sound world-view into the curriculum.

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