

Putting science in its place

*By persistently seeking answers to her questions, Vandana Shiva, a theoretical physicist, began to understand that something was seriously wrong with science if it fostered health-threatening nuclear reactors, encouraged a green revolution that destroyed ecologically safe indigenous agriculture, and justified the clear-cutting of the Himalayan oak forests. In 1988 Shiva's intellectual journey led her to publish **Staying Alive: Women, Ecology and Survival in India** [New Delhi, Kali for Women and London, Zed Books], in which she argues forcefully that the reductionism of Western science, ecologically blind corporate investment, and the violence against land and women in India are all connected. We publish excerpts of her conversation with Barry Greer.*

Question You mentioned that over the last 10 years you've moved from someone who is a scientist trained in the Western tradition to someone who now has taken an ecofeminist position that rejects Baconian-Cartesian thinking. I'd like to know first if growing up in the Himalayan foothills is related to your change in thinking.

Answer I was born and brought up in the region in which I'm now living, and living very close to nature is part of my life. I was also the daughter of a forester, and we travelled a lot. Until the 1960s, we lived in the Himalayas without roads. All the changes that have since taken place are part of my personal family history.

Q You witnessed the roading of the mountains?

A Yes. And I will always love nature, wanted to know nature, and picked up physics as the most effective way to know nature.

Q Your doctorate is in physics?

A No, there was a shift in my career to the foundations of physics. I worked for India's Atomic Energy Commission with the idea of joining it eventually as a scientist, and was informed for the

first time by my sister, who is a doctor, about the hazards of the nuclear system. I felt very cheated, and I wasn't willing to live with the hazard, so I switched to theoretical physics.

I switched [in order] to answer basic questions for myself about how the world works. Every time I had tried to ask those questions of my AEC seniors and supervisors, I was assumed to be rude and disrespectful. Applied physics doesn't allow questions about its own foundations.

Q You weren't allowed to question basic assumptions?

A Not of the science itself. So I shifted into working on the conceptual mathematical foundations of physics, and did a PhD on the foundations of quantum theory.

I went back to India with an urge to relate science more to society, and did work on science policy to understand why Western science in Third World situations never performs as well as it does in the West. I started realising very fast that part of it has to do with the irrelevance of Western science – irrelevance both socially and culturally, but also economically.

That discovery was around the same time that the Chipko Movement [see box next page] was growing more powerful. The movement developed in the mountains where I came from, and I'd go back every summer to work. People were fighting to save the forest where I had been the daughter of the forester in charge. I knew that patch of forest, and it was very different – it was very degraded.

The combination of factors just drew me more and more into working on the ecological issues.

Q Chipko women?

A Yes. Chipko. It was their sense of what is of value in the forest. What they found of value was exactly what we devalued in the scientific system. What the women found wasteful were the pine trees that had been introduced into our area and which are very degrading to the ecosystem. The pine

trees turn the Himalayan foothills arid, they turn the soil acidic.

For agricultural systems, where leaf fodder is very critical to agriculture, pine trees provide no fodder compared to oak or rhododendron. Oak and rhododendron are the first things that are removed by forestry operations that also replace variety with monocultures.

That experience of learning what the forest is – that it's different to different people – was really one of getting closer to the village communities, from whom I'd been insulated in my childhood because of my status and the fact that we lived in barricaded forestry houses. It's really in my adult life that I got to know the ordinary villages and my own people.

Q Was there a particular event that you would consider pivotal in all this?

A There's a very special event. There was a particular place I wanted to go for a holiday. I remembered it from my childhood, a very beautiful stream next to an extremely lovely oak forest. I had not been to the place for 10 years, since I was a child. I planned to swim in the stream, but it was a mere trickle. The forest wasn't there, and there were few trees left. So that, actually, was my initial exposure to Chipko.

I was so troubled about the disappeared river that I talked to the villagers, and they started talking about how badly things had gone. They connected the disappearance of the stream and the deforestation. The World Bank was behind the thinking on this kind of thing. There was a huge horticulture project to plant apples at high altitude. To clear land for apples, they just cleared all the old forest at the top where the streams came from. So you get these barren slopes – even apples don't grow any more. You don't have forest, you don't have apples, you don't have the streams.

Then the villagers said things were improving now, or things will get better, because now we have Chipko. So we visited these full-time activists – about 12 people who have given up their lives to spread the Chipko message village to village, and that's all they do.



Q Are they all women?

A The people who travel are never women, because the women are taking care of everything in the villages: their cows, their children, their fields, and their food. So the people who become full-time activists are always the men.

Q So you're an exception to that?

A I don't have to take daily care of agriculture and feeding the cattle. I have the luxury of walking away.

Q So it was the loss of the stream?

A Yes. The next very big thing was in the early 1980s. Two days after the birth of my son, in September 1981, I got an assignment with a team of people to work on the impact of mining in the region where I was born, where I'd gone to have my baby. I never went back to my job after that; I worked on the matter of mining and just made a total switch away from academic life. Since then, I've lived on with my little boy, and worked informally as life demands ... and survived.

Q Those are the personal experiences that led you to ecofeminism, but could you tell me your intellectual heroes?

A I read them after a lot of my own

Chipko

'Chipko' is a Hindi phrase that means 'embrace our trees'. Northern Indian women who wanted to stop the commercial exploitation and destruction of their forest homeland literally embraced trees to save them from the axe. The women depended day-to-day on the forest for fodder, firewood, and clean water.

Chipko women were 'ecofeminist' long before the word was invented in the West, and in 1987 they were awarded the Alternative Nobel Prize in Sweden 'for vision and work contributing to making life more whole, healing the planet, and uplifting humanity'.

thinking. What I found was a resonance. In fact, after I'd written *Staying Alive*, I then read Susan Griffin and Caroline Merchant. I called the manuscript back from my publisher and said, 'Listen, I've got to cite some people who are saying the same things'. They are my heroes, in the sense that I respect them very deeply, but their contributions aren't formative to my thinking. My heroes are really the village women.

Q Chipko.

A Absolutely. Absolutely. For me, my intellectual assumptions, my assumptions about life and about development – all those shifts have taken place because of these people, whom I respect extremely deeply. I recognise that they are so much brighter in all kinds of ways. They're full of fun, they have the capacity to smile in tough situations. They have so much grit in them. I don't derive as much strength from any other interaction in life. If I visit them twice a year, those are the two occasions when I come back feeling charged.

There are two other people who've been influential to me in India, both very senior men. One is a person who's full-time Chipko, Sunderlal Bahuguna. His work has been a very major con-

tribution to the ecological thinking in the country as a whole.

Another person is a leading intellectual in our country who started working on alternative ideas. He is basically a political scientist, but he became the leading figure in alternative thought, in alternative traditions of knowledge, and created space for freaks like me in our society – you know, places where we could meet and talk and interact. His name is Rajni Kothari.

Q A lot of what you say in *Staying Alive* is a rejection of some fundamental assumptions of Western, masculinised science. You connect two key terms that are related to that criticism: reductionism and violence. Do those ideas connect to the personal experiences that led you to ecofeminist thinking?

A The United Nations University commissioned a programme on a series of issues. One of them was to answer this question: Are science and violence related to each other? I was asked to do a paper for that programme, and it gave me an opportunity to think very seriously about it.

I did a paper called 'The Violence of Reductionist Science'. I tried to work through how the women who were protecting the forest conflicted with a certain world view. What was the violence of reductionist forestry that impinged on them and their beliefs? They knew more about the forest than any forester, but they didn't count as a source of knowledge; and that was a violence. The new knowledge that was brought in was violent to the nature of the ecosystem because it forced apart linkages and relationships that should work in cohesion. Then there was the violence of the 'privilege system, too, because it is built on insularity. And there was the violence I had been subjected to when I was having my little baby, which I fought against and didn't allow to happen. But I could imagine every woman in every society goes through that.

Q Could you explain?

A The conflict between, again, a reduc-

tionist, mechanistic system of handling the female body, against women's knowledge of what they want and see as fit. I went in for my delivery, and the doctor insisted I had to be cut up. I said, why on earth? She said, because you're so old, your body's all wrong. I said, I feel fine. Listen, give me a chance. I was 28, and she said I was too old.

A lot of people say, aren't Newton's laws true? I turn around and say, I'm not talking about that. I'm not talking about abstract equations. I'm talking about science as it comes embodied in concrete, personal relationships. It protects itself as science, and it attacks as science. That's what I'm interested in. Not whether Einstein and Newton are true when they write $E=mc^2$ squared. That's abstract stuff.

Q You stated in *Staying Alive*, very bluntly in places, that Western science ignores or excludes certain bodies of knowledge.

A There's a whole body of knowledge familiar to people who live in the forest. It's a system that has not even been counted. The tropical forest is now a major issue. Who are the people who are consulted at this point about what has to be done with the forest? Nobody is going back to Indian nations in the Amazon and saying, we made a mistake. You tell us what is the forest, what is your knowledge of it. Then we'll base our management strategies on that. The managers and the experts still sit in Washington. I think the biggest threat to the planet has come precisely from the kind of arrogance caused by elevating one knowledge above all others.

Q That elevated knowledge is scientific empiricism?

A Yes, it's a monolith that got created in the West by trampling on its own alternatives – traditions that women carried or dissenting traditions other scientists carried. Those options were squashed.

Even now you can see ecologists, who are more linked with biology in its real life, being totally trampled on by the dominant group in biology, the



In 1974, the women of Reni in northern India threatened to hug the trees to stop them being felled. The women's protest was known as the Chipko movement, and saved 12,000 sq. km of sensitive forest.

molecular biologists. You can see how the plurality, even within biology, is being destroyed to create one monolith, so that everyone says, 'The world is made of genes, the world is made of genes, the world is made of genes.'

I don't think there's any hope for planetary survival as long as there is one knowledge that is more secure, or more valid, with a validity based on invalidating and delegitimising everything else around it. That monopoly on thinking is a basis for the destruction.

Q It's very much a power relationship.

A Yes, very much. Knowledge as power is the biggest threat.

Q Baconian science.

A Once Western science starts taking an equal place, it will very often be that it has to take second place.

Knowledge systems that have been pushed back will turn out to be much more valuable for handling the task at hand.

Q Do you see Euro-American science and technology as the same old 19th

century colonialism in new clothing?

A I see the two very closely linked. In fact, I see Eurocentric science as the invisible instrument of continued colonialism when all other chains have broken.

Q It's still an attempt to influence and manipulate?

A And control, totally.

This interview first appeared in What's Happening magazine, Washington DC.