

Delivered by Vandana

HRH delivers the Sir Albert Howard Memorial Lecture 2nd October 2008

I was most touched and flattered to have been asked by Dr. Vandana Shiva to deliver this year's Albert Howard Memorial Lecture, organized by Navdanya in tribute to two remarkable men, Mahatma Gandhi and Sir Albert Howard. I would, of course, much prefer to be with you today in person and I warned Vandana when she asked me to speak at this event that I would find it impossible to come to India on this occasion. She very kindly said she understood the problem and therefore agreed to a rather truncated video lecture instead.

I think it is true to say this lecture comes at an important time, with the future of much of the world's food production at a cross roads. Fundamental issues of food supply and food security are once again in the headlines, and there is much public discussion about what needs to be done. I want to use today's lecture to try and tease out some of the issues and discuss the options, through the lens that Sir Albert Howard might have used were he here today. But first I must talk a little about the man himself.

Sir Albert Howard was born in England in 1873, the son of a farmer. Educated at the Royal College of Science and Cambridge University, he began his career as an agricultural scientist in the West Indies, taught briefly in England and then worked in India for more than a quarter of a century. Early in his career he complained that he was becoming a 'laboratory hermit', 'learning more and more about less and less.' This led him to change his approach entirely and he soon became known, in the words of a contemporary, as 'a man who insisted on knowing all about everything.'

Howard was insatiably curious, thorough and rigorous, but with a strong streak of humility. And it was this combination of traits that, in a very short time, allowed him to observe and learn from the practical, every day achievements of the local farmers. In the words of his wife, herself a noted botanist: 'he was fortunate in being able to offer India results worthy of her notice, but he could not have done so had he not first been receptive to her teaching.' Early on in his time in India he decided that to impose Western methods on Indian agriculture was a fundamental error and that the only thing to do was 'to improve Indian agriculture on its own lines'. And that is exactly what he did for the next twenty-five years. If only others would learn from his example in our own age...

Sir Albert applied intense observation to both plants and farming practices, with careful reference to the world of Nature, which he regarded as the ultimate source of knowledge and wisdom. He summed up his observations from this natural laboratory in these words: 'Mother Earth never attempts to farm without livestock; she always raises mixed crops; great pains are taken to preserve the soil and prevent erosion; the mixed vegetable and animal wastes are converted into humus; there is no waste; the processes of growth and the processes of decay balance one another; ample provision is made to maintain large reserves of fertility; the greatest care is taken to store the rainfall; both plant, and animals are left to protect themselves against disease.' He also said: 'Nature has never found it necessary to design the equivalent of the spraying machine and the poison spray for the control of insect and fungous pests.' These were seminal, far-reaching words that helped to set the direction for what we now know as organic farming. But Sir Albert didn't focus on issues of agronomy and plant breeding alone. He also developed a recipe for a compost which was so

successful that it was used across the country, and he made careful studies of the storage, marketing and distribution of crops, which led – among other innovations – to the development of a returnable fruit crate, to the intense annoyance of the Indian Railways! In everything he did he was at pains to see the whole picture and then provide the best possible advice to the country and people for whom he had such admiration and affection and to whom he felt such a strong and uncomplicated sense of duty.

The question, then, is what would Sir Albert Howard make of the situation we now find ourselves in? It is impossible to know, of course, and no doubt all sorts of people will further accuse me of wanting to return to “a forelock-tugging, peasant past” when, in fact, all I would like to see is autonomy given back to the small, family farmers. So, if you don't mind, I am going to speculate anyway based on what we know of his life and work. Incidentally, I am also aware of Mahatma Gandhi's crucial perception that Humanity has a natural tendency to consume. But, as he said, if there are no limits on that tendency then we can become obsessed with satisfying our desires, consuming ever more, but achieving very little satisfaction. What is more, Gandhi was very sure that if this tendency is legitimized by a view of the world that puts Humanity at the centre of things, operating with an absolute right over Nature, then we shall end up with a very destructive world view indeed - dare I say it, the very approach which has driven so much of Western Modernity for over a century.

Therefore the first thing that comes to mind is that someone so determined as Sir Albert to look beyond the confines of individual academic disciplines and to see the ‘big picture’ would be quick to understand the links between climate change and agriculture. Estimates of the total contribution agriculture makes to climate change vary from ten to thirty per cent, though there is little public awareness of the link. A recent summary of peer-reviewed scientific literature concluded that organic agriculture has much to offer in terms of mitigation of climate change, through its emphasis on closed nutrient cycles, and is a particularly resilient and productive system for adaptation strategies. It was this report which pointed out that organic agriculture emits 36 per cent less greenhouse gasses than the industrialized system of farming which, having broken a 10,000 year old tradition, has somehow become known as “conventional”!

This so-called ‘conventional agriculture’ is dependent to a large extent on artificial fertilisers and pesticides made from and with fossil fuels. So I feel sure that Sir Albert Howard would have been keen to address the pre-eminent challenge of climate change by working with organic systems to reduce further their contribution to this ever-growing crisis.

The next question must be about the reaction of a rigorous but practical scientist, attuned to economic issues, to the suggestion that G.M. food is now essential to feed the world. These claims, of course, have surfaced again recently in response to crises of food supply in various parts of the world. There can be few things more horrific than starvation, especially when so many of us in the Western world live with plenty, and I share entirely the desire of all those who want to tackle it. The argument, ladies and gentlemen, is all about how we solve this problem and I would suggest, having spoken to many experts, that G.M. is probably not the answer.

The key question to be answered, therefore, is whether traditional farming methods can provide the yields needed to feed the world's population. If they can, then the risks associated with G.M. crops are surely just not worth taking. And the evidence so far is that the yields from these so-called "super crops" are generally lower than their conventional counterparts, and certainly no higher. I shall talk some more in a minute, if I may, about the recent United Nations report on Agricultural Science for Technology and Development. This was the output of a four year review by 400 experts and, interestingly, far from endorsing G.M. crops as the solution to world hunger, it argued in favour of more organic approaches, expressing particular caution about the concentration of ownership of the genes in the hands of a few companies.

So if the current generation of G.M. crops aren't increasing yields, perhaps the next generation will do so? Yes, of course, say their protagonists. But that's what they were saying ten years ago, with fulsome promises of crops that would fix their own nitrogen, or tolerate drought and salinity. Yet no such crop has been delivered. On the contrary, Professor Ossama El-Tayeb, Professor Emeritus of Industrial Biotechnology at the University of Cairo, said recently that: '...transgenicity for drought tolerance and other environmental stresses (or, for that matter, biological nitrogen fixation) are too complex to be attainable in the foreseeable future'.

As a practical man, with a strong sense of duty to farmers, Sir Albert Howard would most certainly have turned a beady eye on the problems that are now emerging, as widely predicted, with the first generation of G.M. crops. Apart from the truly appalling and tragic rate of small farmer suicides in India stemming in part from the failure of many G.M. crop varieties, these problems include insect and weed resistance, leading to increased pesticide use, together with problems of nutrient uptake and damage to biodiversity. He would also have been greatly concerned at the danger of relying on single varieties for a large proportion of any staple crop – if there are only one or two varieties being grown in bulk and disease strikes, the consequences are cataclysmic and tragic. That is why a broad gene base is essential – for both plants and animals. Equally, I am sure that Sir Albert would have been quick to realize that any G.M. crop will inevitably contaminate neighbouring fields – as long as we have wind and bees – thus making it impossible to maintain the essential integrity and certification of an organic – or just a non-G.M. - system anywhere in the vicinity of a G.M. crop. Surely, if there is even the chance of the genes from G.M. plants contaminating non-G.M. plants, then this single fact, never before known in human history, of one man's system of farming effectively destroying the choice of another man's – let alone the choice for the consumer - turns this whole issue into a global moral question..? Which prompts me to remind you of just two of the seven blunders that Mahatma Gandhi identified as the root causes of all violence in the world: "Commerce without Morality and "Science without Humanity".

If Sir Albert would have been concerned by the aspects of G.M. crops that I have mentioned already, I suspect the issue that would have caused him to become greatly concerned, were he here today, would have been the question of research, and the current lopsided allocation of funding for it. As a scientist immersed in the tradition of publicly-funded research, with outputs available to all, he would surely think it more than unwise to leave such a high proportion of our research to be carried out by companies whose survival and financial progress inevitably depends on agriculture being dominated by products and techniques that

can be exploited commercially. We should not be surprised that this research runs the risk of being centred on such things as patented seeds, pesticides and G.M. crops, all of which will earn a return on investment for their developers, rather than on more sustainable, low-tech approaches which would earn a return for all of humanity.

Sir Albert Howard was not opposed to business and neither, of course, am I. Indeed, in my experience it is often business that has led the way in addressing some of the most pressing and urgent social problems of the day. But it may be reasonable to suppose that Sir Albert would have regarded G.M. crops as a wrong turning on the route to feeding the world in a sustainable, or durable manner, which have become a risky and expensive distraction, diverting attention and resources away from those real, long-term solutions such as crop varieties which respond well to low input systems that, in turn, do not rely on fossil fuels.

I daresay he might also have asked why both public and private research funds could not be used to find alternative techniques to improve traditional farming methods which have stood the test of time and which do the very thing that is so urgently needed in the battle against devastating climate change – in other words, to work in harmony with natural systems, not against them. Sir Albert might easily have pointed out under these circumstances that for too long we have been conducting a gigantic experiment designed to test Nature, and the world, to destruction in order to obtain the empirical evidence that it is possible to do so. The problem, of course, is how to put all the pieces back together again...

It is hard to know where so many people's determined belief in the availability of a big, quick, technical fix to each and every environmental problem comes from. But it is a huge barrier to making progress in so many important areas. Somehow it seems that solutions which are big and complicated, and ideally centralized, are believable. But those that are small and simple and devolved are not. They are considered as merely peripheral and not part of the "real world."

Perhaps, again, it is a result of what Gandhi defined as the mistaken view of Humanity that sees consumerism as a viable basis for a world economy. Gandhi saw humans as essentially moral beings whose distinctive quality lies in our ability to restrain ourselves because of mutual concern. In other words, to give as well as to take; to "love" creation, in the deepest sense of that word. He called for us to examine very critically where our desires might lead us and, thus, to limit the power they have to propel us forward – his aim being to increase the chances of creating a more just and non-exploitative society.

It is clear that many people believe the only way to feed a growing world population will be through ever greater intensification of agriculture, with larger farms and more 'efficient' production. In this scenario, traditional practices are swept away in favour of 'modern' systems that rely on external inputs of chemicals, heavy machinery and genetically modified seeds. And yet, at the same time, agricultural land is permitted to be diverted away from food production in order to produce bio-fuels. These are used as a substitute for the fossil fuels which are required to produce the fertiliser and pesticides, and to power the machinery required for intensive agriculture – on the land which isn't being used for bio-fuels. At this point surely we are entitled to ask whether this extraordinary conventional response to the challenges we face is in any way "sustainable" or, indeed, wise? The trouble is that it isn't

any sort of solution to the real problem. Ladies and gentlemen, I worry that all we are doing here is tinkering with the symptoms and not dealing with the root cause.

There are of course many examples of appropriate technologies that do not claim to provide miracle cures for intractable global issues, but which have the great advantage of working with Nature, recognizing the limitations required by Nature to manage the necessary balance, and which can be deployed alongside sustainable farming practices to boost incomes and the quality of life in rural communities. Each year, for instance, the Ashden Awards for sustainable energy celebrate exciting and innovative projects, such as the wood-saving stoves developed in India by the organization TIDE. Each stove is developed for a particular sector and with the active participation of the users. They reduce the use of biomass by at least thirty per cent, and more in some sectors, and enable better working conditions and a reduction in respiratory and eye diseases. 150,000 tons of biomass have been saved since the scheme started in 2000, leading to reduced deforestation and the saving of 77,000 tons in greenhouse gases each year.

The reason I keep sticking my sixty-year-old head above an increasingly dangerous parapet is not because it is good for my health, but precisely because I believe fundamentally that unless we work with Nature in a myriad of ways such as this we will fail to restore the equilibrium we need in order to survive on this planet. This applies whether we are talking about climate change, about the destruction of the rainforests – which of course do so much to maintain our climate in its state of balance – about water conservation, fisheries or any one of a whole raft of other issues we need to bring under some sort of sensible, wise control if our successors are to inherit anything other than a wasteland.

There is in fact a substantial body of evidence now to show that the world's growing population can be fed most successfully in the long-term by agricultural systems that manage the land within environmental limits and maintain soil fertility through the use of crop rotations and the recycling of organic wastes, while minimizing the use of non-renewable inputs. These systems also make careful use of water and use crop varieties selected for the local conditions. Such sustainable, "organic" systems (and the Oxford Dictionary describes "sustainable," as "keeping something going over time, or continuously") are easily portrayed as old-fashioned, but they have stood the test of time. And they can be improved by working with small farmers in a process of demonstration and example that is as effective now as it was in Sir Albert Howard's day. Recent research has shown increases of up to 250 per cent in maize yields in Brazil through the use of green manures and cover crops. Also yield increases of 175 per cent on Nepalese farms adopting agro-ecological practices. And in Tigray, in Ethiopia, yields increased by a factor of three to five when composting was used instead of chemical sprays.

I am, of course, entirely used to such ideas, and the evidence (yes – the evidence) that goes with them, being dismissed as romantic, idealized, ill-informed and impractical nonsense. So it was interesting, if not revealing, to read the recent U.N. report I mentioned earlier in this lecture. It is probably the first such report in the last twenty years not to have trumpeted the potential of G.M. to save the world. But there is a great deal more to it than just that.

The report which, as you remember, involved a four-year review by 400 of the world's experts, stresses that 'business as usual' is no longer an option. It points out that although

agricultural science and technology have made it possible greatly to increase productivity in the last fifty years, the sharing of benefits has been far from equitable. Furthermore, progress has been achieved in many cases at a high social and environmental cost. The authors therefore recommend that agricultural science places greater emphasis on the need to 'enhance sustainability while maintaining productivity in ways that protect the natural resource base and ecological provisioning of agricultural systems.' These methods include using natural fertilizers, intensifying natural processes and reducing the distance between agricultural production and the consumer. The report also states that thirty-five per cent of the earth's severely degraded land has been damaged by agricultural activities. And it stresses the need to develop agricultural systems that are less dependent on fossil fuels and that favour the use of locally available resources.

I need hardly add that such sentiments would in all likelihood have met with approval from Sir Albert Howard and Mahatma Gandhi. They might have been even more pleased to know that the report also stresses an important human dimension when it says that: 'traditional and local knowledge constitutes an extensive realm of accumulated practical knowledge and knowledge-generating capacity that is needed if sustainability and development goals are to be reached.' This seems to me to be such an obvious point that I can never understand why it is so rarely recognized by policy-makers and politicians.

After all, farmers know their land, with all its strengths, weaknesses and complications better than anyone else ever will. And they understand the relationship with the soil. As one Indian farmer put it, the soil is 'like a dependable Bank' – you get back what you put into it with interest! Sustainability in this sense really does have a cultural dimension, because once that closest of personal links between people and land is broken, it cannot ever be truly recreated. That is why it surely makes sense to retain as many people as reasonably possible to care for the land and to ensure food production does not end up having 'all its eggs in one technological, quick-fix basket' It is in the accumulated experience of generations of farmers that true wisdom lies. Incidentally, one must surely ask the question whether – if only from a precautionary point of view – it might be wise to keep some areas of the world free from G.M. based agriculture?

One of the chief criticisms levelled at small-scale, sustainable agriculture is that it is 'inefficient.' But is it - especially when you look at the whole picture? Large farms can certainly produce more food per person employed, through the use of machinery and from economies of scale. But shortage of labour is not the problem in the developing world. Indeed, in many parts of the world the introduction of so-called 'efficient' farming is leading inexorably to a tide of dispossessed individuals and families drifting helplessly towards already overcrowded, unplanned, degraded cities in search of often non-existent work. I have seen this only too often for myself. The conditions in which countless people find themselves living can be utterly inhuman and devoid of dignity. If we continue to allow the so-called 'industrialization of agriculture', this situation will only worsen. And where, exactly, is all the "sustainable" future employment for so many millions of landless people going to come from, despite the best efforts of charitable organizations like my own to assist with small business development? Are we not in danger of creating, ladies and gentlemen, a generation of "environmental refugees" - people not displaced by religion or war or politics, but as the result of a failure – an absolute failure – to protect and sustain natural resources?

Small farms generally produce more food per acre than large ones, because they work the available land more intensively with more care and attention to detail. And when those small farms adopt the kind of improved practices, leading to higher yields, that I mentioned earlier, and when they are able to form large and effective marketing cooperatives, they can justifiably claim to be a good deal more 'efficient' than their larger neighbours, particularly if climate change and other environmental factors are included in the equation. Of course, businesses need to make profits – but not, I suggest, by using unsustainable farming systems at a huge future cost to all of our grandchildren!

So, ladies and gentlemen, where does all of this leave us? Everyone agrees that the current global food crisis is a desperate tragedy. There can be no argument there (although in my own country it is perhaps worth noting that little is being done to tackle the £10 billion worth of food which is wasted each year). The debate really is very simple. Do you think we can solve it by using traditional agricultural practices enhanced by research to increase yields, but within a truly sustainable framework? Or do you think that is impossible and that instead it is worth taking all the risks that I would argue are associated with G.M. technology? To me, the answer is pretty straightforward. I want to see trust being put back in individual farmers, with their knowledge of the land and their skills honed over generations, and thus helping them find the sustainable solutions which respect – rather than upset – Nature's natural balance. After all, just as the myriad of small businesses are the mainstay of any economy, so are small family farmers the backbone, the lifeblood and the guardians of the rural environment.

I have no doubt that those of us who care about these issues will have to fight for many more years before we have a general acceptance that there is more than one sort of 'efficient agriculture', and that Nature's limits are not shortcomings that need to be 'fixed,' but guidelines we need to understand and work within, recognizing that they place limitations on our ambitions and the ways in which we pursue them. This was something that Sir Albert Howard and Mahatma Gandhi both understood and did their best to communicate in their different ways. It is also something to which Dr. Vandana Shiva has dedicated her life with such extraordinary passion and expert knowledge and for which I have nothing but the greatest admiration. She may possibly subscribe to the biblical admonition that it may not be wholly wise to "put your trust in princes" – but it may be even less wise to put your trust in "fixes!"

Ladies and gentlemen, I would just like to leave you with a quote from Gandhi. As he so wisely said: 'we may utilize the gifts of Nature just as we choose, but in her books the debts are always equal to the credits.'