

## BOTANICAL GARDENS AND ENVIRONMENTAL EDUCATION

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The World botanical gardens have a very long history and tradition in the field of education. The first gardens founded in Europe at Padua and Pisa, were created specifically as gardens for the cultivation of medicinal plants for use in the teaching of medicine at the ancient city universities and later ones such as Oxford Botanical Garden were established for the teaching of botany as a separate science from medicine. Many gardens are still closely associated with universities, Cambridge and Utrecht for example, and have a very strong formal education component in their work and, in some cases, in the lay-out of their botanical displays. Others are famed for their prestigious schools of horticulture, Adelaide, Kew and Edinburgh for example.

This traditional specialized, higher education role has, in many gardens, been complemented by a more popular public education component and this has been actively pursued at places such as Kew and Missouri but at others has been simply a passive and generally unplanned -for side effect of sho-

wing a wide spectrum of plant life to the general public.

These traditional activities are, however, insufficient to contribute to the fulfillment of the needs of a modern society faced with an ecological and natural resources crisis on what is a previously unimaginable scale. Modern botanical gardens have a role in society with new and extremely important elements in it. These include the "ex situ" maintenance of rare and endangered species using advanced techniques such as low temperature seed storage, "in vitro" cultivation, field gene-banks, research on reproductive biology, ecology and demography of endangered plants as a contribution to the "in situ" management of species and communities in reserves, National Parks etc. Possibly the most important element is education and informing society about the environment and presenting the case for a conservation-orientated sustainable development solution to the global environment crisis based on the protection of and rational use of natural resources. The message that "Huma-

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nity must live within the carrying capacity of the Earth", which is the theme of the new World Conservation Strategy - **Caring For The Earth**, is the basis for such a conservation policy and should be the source for our general education programmes. On the other hand, however, the need for education and the means and resources available to educators are so variable from place to place that most programmes for education in botanical gardens must be specifically designed to meet local means, requirements and social circumstances. The idea of teaching the captains of British industry to have a social and environmental conscience by taking them to afternoon tea with Prince Charles is hardly a technique that Terry Keller could adapt for use in the Bronx.

We are often told that botanical gardens are in the wrong places, that is they are mainly concentrated in the northern hemisphere in the developed regions of North America and Europe. Perhaps they are the wrong places if we are considering their proximity to the natural centres of biodiversity which are mainly in tropical and subtropical regions of South America, Africa and Asia. If, however, we consider the location of botanical gardens from an environmental education point of view, those in Europe and North America close to or in large cities are ideally situated, located as they are next to the great capitals of our consumer society where, for example, one European citizen (according to World Bank figures) consu-

mes at least 40 times as much of the world's natural resources per year as one East African and a North American even more than 40 times with the difference increasing annually!!! These are the places where we need to inform and educate people about the rational use of the earth's resources, about biodiversity, the need to protect major ecosystems as a cushion against climatic changes and so on, and where we really need to produce new generations of administrators and legislators who understand what environmental issues are about. I'm sure we don't need to educate the Indians of the Amazon or the Aborigenes in the Australian outback about the sustainable use of their local natural resources of flora and fauna, they could probably teach us all we need to know about the process if only we had the sense to listen.

So I'm sure that the world distribution of botanical gardens is not quite so unbalanced after all, indeed, it fits quite well into a pattern of where we really need to educate people.

There is a good analogy to which I have referred on other occasions, between the role of botanical gardens and the world of life insurance. The botanical garden with its living collections, seedbank, trained specialist scientists and horticultural staff is like an insurance policy against the loss of species, the depletion of biodiversity and it is a provider of resources to build for the future - for the reintroduction of spe-

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cies, restitution of ecosystems and so on.

Insurance policies even have what might be termed an information and education content -the small print- I'm sure you've all read the small print, it usually advises you not to fly on unscheduled flights or planes with only one engine or not to ski off the piste.

The analogy between insurance policies and botanical gardens goes even further, it is a very well known fact about insurance policies that if you don't keep them up to date, if you don't religiously pay the regular premiums (including increases, inflation factor and so on, if required to do so) when you most need your policy when something goes wrong you find it out of date, cancelled, null and void or even revoked, to put it simply no use whatsoever and you certainly don't get the final bonus at the end. This should be a lesson for those who have it in their power to pay for botanical gardens, for those who can help to insure and ensure the survival of ecosystems and plant diversity on the planet. National parks which can protect "in situ" our major ecosystems and concentrations of species are also a good example of this insurance policy analogy.

Our plant diversity insurance policy with the world network of botanical gardens at its heart certainly has its information and education clause, and not just in the small print. As we can all see here by the response to this confe-

rence, botanical gardens have a major commitment to education and if we are going to use this commitment to attack the problem of making people aware of the environment and its difficulties we have to have a working plan to use as a basis. Fortunately as we will see later in this congress this plan, The Environmental Education Strategy for Botanical Gardens, is in a very advanced stage of preparation. This gives me a good deal of personal satisfaction because in November 1985 we held a conference here in Las Palmas de Gran Canaria following the publication of the IUCN/WWF World Conservation Strategy. The conference was, in fact, called Botanical Gardens and the World Conservation Strategy and its mission was to see what botanical gardens could do to help implement the strategy. One of the main results was the creation of BGCI (Botanical Gardens Conservation International) and the decision to produce a Botanical Gardens Conservation Strategy to define the Botanical Garden role in conservation. This has now been published. Both the new guidelines for the "ex situ" conservation of wild plant germplasm and the guidelines on reintroduction which are to be published later this year, as well as the Education Strategy to be discussed at this meeting, are part of the on-going process of integrating botanical gardens into the mainstream, perhaps better the vanguard, of plant conservation.

So what are the social perspectives

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and prospects for education in botanical gardens??

In general within the framework of plant conservation we should not let it be considered that we are playing a minor role, botanical gardens are already the custodians of somewhere between 80,000 and 100,000 species of wild plants in our living collections and seed banks. We are also by our research and experience also increasingly contributing to and participating in the management of "in situ" plant populations and ecosystems and to reintroduction projects etc. but we must also make sure we make full use of one of our main assets - those 150,000,000 people of more who come in through our gates every year. To them we must sell the message of the importance of plant and indeed of all nature conservation.

We also have in our hands, for at least a few hours of their young lives, enormous numbers of schoolchildren and other young people. They are a generation who will eventually become

the decision makers of the future, the generation who will have to manage what little of nature we will have left to them because of our short-sighted politically expedient policies. The least we can do is leave them with the knowledge and wisdom to manage it better than we have. As a part of our programme we should try to go outside the garden and reach out to get the message over to even more millions of people. Botanical gardens should try to become an integral part of local society and local cultures and

to be recognised as important centres with a major mission in the management of natural resources in the future. We are now very close to having a strategy to apply and we must be ready to grasp the nettle, to take up the challenge, because at this moment there are few other organisations as well situated or well equipped to do it as are the botanical gardens forming as they now do a major world plant conservation network.