roots

Botanic Gardens Conservation International Education Review

BOTANIC GARDENS

Education for Sustainability

- The Pulling Power of Plants
- Quand les Botanistes Deviennent des Animateurs
- Teacher Capacity Building in South Africa
- Education by Stealth – Educating People Who Didn't Come to Learn
- Challenging Science Education
- The Genesis of the Medicinal Plants Conservation Network in India

20

July 2000

4th International Congress on Education in Botanic Gardens

Contents

Subscriptions

Roots is published twice a year as a service to the BGCI education network. It is sent to member gardens as part of their annual subscription. For information on how to become a member please contact BGCI or refer to the back cover of this edition of Roots.

Forthcoming Issues

Roots 21 - Evaluation - Last submission dates: Articles - August 25, 2000, News - August 31, 2000

Roots 22 - Environmental Ethics - Last submission dates: Articles - February 16, 2001, News - March 16, 2001

International Congress on Education in Botanic Gardens

■ Editorial

This issue of Roots features a few of the excellent presentations and includes, as an insert, the recommendations of the 4th BGCI International Congress on Education in Botanic Gardens, held in Thiruvananthapuram, southern India, last November. The congress was co-hosted by the Tropical Botanic Garden and Research Institute (TBGRI) and BGCI and focused on setting new directions for botanic garden education in the new millennium.

India was the perfect location for the congress. The use and value of plants in all aspects of daily life in India is highly evident - even in the congress hotel room. A simple leaflet in a packet of soap, for example, explained its value, gave an introduction to Ayurvedic medicine, stated where the key ingredients were grown in the world and listed the 20 plant species contained within the product! Certainly the high profile of plants in India served to emphasise the importance of maintaining biodiversity and the sustainable use of resources.

Throughout the congress, delegates from 22 countries took the opportunity to network and share ideas, resources and concerns. It is clear that botanic garden educators are supporting, empowering and learning from their communities. How we use plants to raise development and environmental issues however is a recurrent question, and one that was tackled by John Huckle in his key note speech and presented here in his paper. Alexis Symonds, Education Officer for the National Botanical Institute in South Africa, reminded us that the primary concern for most of the world's people is not the issue of global sustainability but where their next meal is coming from. In recognising this, staff at NBI have developed an education programme to help the community learn how to sustainably use their environment.

▲ Editorial

Ce numéro de Roots regroupe quelques présentations ainsi que les recommandations du 4ème Congrès International du BGCI sur l'Education dans les jardins botaniques, qui s'est tenu à Thiruvananthapuram, dans le sud de l'Inde, en novembre dernier. Ce congrès, organisé conjointement par le Tropical Botanic Garden Research Institute (TBGRI) et le BGCI, s'est attaché à trouver de nouveaux enjeux pour l'éducation dans les jardins botaniques du XXI siècle.

L'Inde, si soucieuse de la valeur des espèces végétales et de leur utilisation dans la vie quotidienne se prêtait parfaitement à l'organisation d'un tel congrès. L'échantillon de savon trouvé dans notre chambre d'hôtel était une parfaite introduction à la médecine ayurvédique. Un simple dépliant glissé à l'intérieur de l'échantillon listait pas moins de 20 plantes utilisées pour la fabrication du produit et expliquait leurs propriétés et indiquait leur provenance. L'importance des plantes en Inde a permis de mettre l'accent sur la nécessité de la sauvegarde de la biodiversité ainsi que sur l'utilisation durable des ressources.

Pendant le Congrès, les délégués des 22 pays représentés ont eu la possibilité de se réunir, partager leurs idées, leurs préoccupations et parfois d'échanger des ressources. Il est clair que les éducateurs de jardins botaniques sont fortement impliqués dans leur communauté, à la fois la soutenant et apprenant d'elle. Mais la manière dont nous nous servons des plantes pour aborder les questions d'environnement et de développement est cependant une question récurrente qui fut d'ailleurs soulignée dans la conférence de John Huckle que nous présentons ici. Alexis Symonds, chargée de l'Education au National Botanical Institute en Afrique du Sud, nous a rappelé que la plupart des personnes ne se soucient pas de gestion durable quand la première question qu'ils se posent est de savoir

● Editorial

Este número de Roots presenta algunas de las excelentes comunicaciones, e incluye las recomendaciones, del Cuarto Congreso Internacional de Educación en Jardines Botánicos del BGCI, que ha tenido lugar en Thiruvananthapuram, en el sur de India, en el último mes de noviembre. El congreso fue auspiciado conjuntamente por el Jardín Botánico Tropical e Instituto de Investigación (TBGRI) y por el BGCI, y se concentró en establecer nuevas orientaciones para la educación en los jardines botánicos en el nuevo milenio.

La India ha sido ubicación perfecta para el congreso. En este país es evidente el uso y valor de las plantas en todos los aspectos de la vida cotidiana -incluidas las habitaciones del hotel del congreso. ¡Un sencillo folleto del jabón de tocador, por ejemplo, explicaba sus propiedades con una introducción a la medicina Ayurvédica, declaraba donde se cultivaban las plantas de sus ingredientes más importantes y listaba las 20 especies de plantas contenidas en el producto! Verdaderamente, la gran atención que se presta a las plantas en India nos ha servido para revalorizar la importancia del mantenimiento de la biodiversidad y del uso sostenible de los recursos.

A lo largo del congreso, los delegados de 22 países aprovecharon la oportunidad para compartir ideas, recursos y preocupaciones, ampliando la red. Es evidente que los educadores de jardines botánicos están apoyando, fortaleciendo y aprendiendo de sus comunidades locales. Cómo utilizamos las plantas para suscitar temas medioambientales y del desarrollo es una cuestión recurrente que John Huckle abordó en su comunicación preliminar aquí publicada. Alexis Symonds, educador a del Instituto Botánico de Sudáfrica, nos recordó que la principal

■ Editorial

Another exemplary programme, featured in this issue of Roots, is that of the Gurukula Botanical Sanctuary in India, where a very conscious decision has been made to leave technology behind. Suprabha Seshan explains how their education programme aims to narrow the gap between people and nature. Staff recognise that living and working with nature requires and demands alertness of the senses which is why their day to day operations focus on sensitising visitors to these values.

Staying in India, Hariramamurthi explains the vital role of the Foundation for the Revitalisation of Local Health Traditions (FRLHT) that works with the community to conserve local knowledge of plant remedies for preventable and curative medicine. With the majority (70%) of the rural population depending on these plant remedies his paper makes it clear that this knowledge should not lost.

These are just a few examples of the education programmes presented at the congress and featured in this issue of Roots. Each of them offers a model for botanic gardens wanting to address sustainability and development issues. We hope you enjoy this edition and that you are as inspired as we were during our time in Thiruvananthapuram, India.

On behalf of all the delegates and BGCI I would like to thank all the staff at TBGRI for their warm hospitality and for making the congress in India a very special and inspiring time that will be in our memories forever.

Look for the following symbols...

■ **English**
▲ **Français**
● **Español**

▲ Editorial

comment ils vont se nourrir. Ayant pris conscience de ce problème, le personnel du NBI a mis en place un programme éducatif qui aide la communauté à connaître et utiliser les ressources de leur environnement de façon durable.

Un autre programme exemplaire repris dans ce numéro de Roots est celui du Sanctuaire Botanique de Gurukula en Inde, où la décision de laisser de côté toute aide technologique a été prise de façon volontaire. Leurs programmes éducatifs visent à réduire la distance entre les hommes et la nature, et que le personnel du Sanctuaire de Gurukula reconnaît que vivre et travailler dans la nature nécessite un éveil des sens et c'est sur ce dernier point que reposent leurs activités avec le public.

Pour continuer avec l'Inde, Hariramamurthi a expliqué le rôle essentiel de la Fondation pour la Revitalisation des Traditions Locales de Santé (FRLHT) qui travaille avec les communautés à la préservation des connaissances des médicaments locaux en médecine préventive et curative. Cet exposé a bien mis en évidence l'importance de la conservation de ces savoirs quant on sait que 70% de la population rurale dépend de médicaments végétaux.

Voici donc un aperçu des programmes éducatifs présentés durant le Congrès qui figurent dans ce numéro de Roots. Chacun d'eux est un modèle pour les jardins botaniques qui veulent mettre en avant les notions de gestion durable et de développement. Nous espérons que vous apprécierez ce numéro et que vous y trouverez l'inspiration que nous avons éprouvée durant ce Congrès de Thiruvananthapuram.

Au nom de toutes les personnes présentes au Congrès et au nom du BGCI, je voudrai remercier ici tout le personnel du Tropical Botanic Garden Research Institute pour leur chaleureuse hospitalité et pour avoir fait de cette rencontre un temps fort et riche qui restera dans nos mémoires pour longtemps.

● Editorial

preocupación para la mayoría de la población mundial no es la sostenibilidad sino la supervivencia. Reconociendo esto, el personal del Instituto ha desarrollado un programa educativo para ayudar a cada comunidad en el uso sostenible del medio ambiente.

Otro programa ejemplar, presentado en este número de Roots, es el de la Reserva Botánica Gurukula en India, en donde se ha decidido evitar la tecnología. Suprabha Seshan explica cómo su programa educativo intenta acercar la gente a la naturaleza. Es de destacar que su principal preocupación es la atención a los seres humanos. El personal en Gurukula estima que vivir y trabajar con la naturaleza exige una permanente alerta de los sentidos, y en ello educan a los visitantes.

También en India, Hariramamurthi explica el papel vital de la Fundación para la Revitalización de las Tradiciones Sanitarias Locales (FRLHT), que trabaja para conservar el conocimiento popular de la medicina preventiva y curativa. Teniendo en cuenta que el 70% de la población rural depende de los remedios de estas plantas, es evidente que es un conocimiento que no debe perderse.

Estos son solamente algunos de los programas educativos presentados en el congreso y publicados en Roots. Cada uno de ellos ofrece un modelo para los jardines botánicos que afrontan los problemas de sostenibilidad y desarrollo. Esperamos que disfruten con este número y que se sientan tan inspirados como nosotros en Thiruvananthapuram, India.

De parte de todos los delegados y del BGCI, me gustaría agradecer a todo el personal del TBGRI por su cálida hospitalidad y por hacer del congreso en India un momento especial e inspirador que permanecerá en nuestra memoria.

news up date...dernières nouvelles...últimas noticias...

News up date

■ News

Education for Sustainability Guidelines

During the 4th International Congress on Education in Botanic Gardens BGCI began the process of working with members to develop education for sustainability guidelines for botanic gardens. Some of the congress workshops were specifically designed to produce information to be incorporated into the guidelines with participation from congress delegates. These workshops were facilitated by Abel Atiti (National Museums of Kenya), Gail Bromley (RBGKew, UK), Kathleen Gordon (Consultant, Australia), Bill Graham (Birmingham Botanical Gardens and Glasshouses, UK), Edelmira Linares (UNAM, Mexico), Dawn Sanders (Chelsea Physic Garden, UK), A.E. Shanavaskhan (TBGRI, India) and Rachel Smith (University of Birmingham, UK). BGCI is extremely grateful to these people for generously donating their time to help develop the education for sustainability guidelines that will assist botanic gardens in focussing their attention on holistic issues of sustainability. By involving ourselves in the process, identifying the issues for botanic gardens, embracing education for sustainability and critically assessing the guidelines as they develop, BGCI and its members can produce a practical document that can meet the needs of individual gardens.

Julia Willison, BGCI's Head of Education, is currently writing the guidelines using the material produced in the congress workshops. A draft will be circulated to members and placed on the BGCI web site for comment in the next few months.

▲ Nouvelles

Guide pour une Éducation au Développement Durable

Pendant le 4ème Congrès International sur l'Education dans les Jardins Botaniques, s'est amorcé une étape de réflexion entre les participants en vue développer un guide pour l'éducation au développement durable dans les jardins botaniques. Certains ateliers du congrès étaient spécialement destinés à produire des éléments à intégrer dans le guide avec la participation des congressistes. Ces ateliers étaient coordonnés par Abel Atiti (Muséum National du Kenya), Gail Bromley (JB Royal de Kew, UK), Kathleen Gordon (Consultant, Australie), Bill Graham (Jardin botanique et serres de Birmingham, UK), Edelmira Lineares (UNAM, Mexico), A.E. Shanavaskhan (TBGRI, Inde), Dawn Sanders (Chelsea Physic Garden, UK) et Rachel Smith (Université de Birmingham, UK). Le BGCI est extrêmement reconnaissant à ces personnes d'avoir donné de leur temps pour aider au développement du guide de l'éducation au développement durable qui devra aider les jardins botaniques à concentrer leur attention sur les enjeux globaux du développement durable. En s'impliquant nous-mêmes dans le processus, en identifiant les enjeux pour les jardins botaniques, en envisageant l'éducation au développement durable sous toutes ses facettes et en évaluant de façon critique le guide au fur et à mesure de son élaboration, le BGCI et ses membres peuvent produire un document pratique qui peut répondre aux besoins de chaque jardin.

Julia Willison, Responsable de l'éducation au BGCI, est actuellement en train d'écrire le guide, en utilisant les éléments produits pendant les

● Noticias

Lineamientos de Educaciòn Para la Sustentabilidad

Durante el IV Congreso Internacional de Educación en Jardines Botánicos, BGCI inició el conjuntamente con sus miembros el desarrollo de los lineamientos de educación para la sustentabilidad en los jardines botánicos. Algunos de los talleres del congreso se diseñaron específicamente para que con la participación de los asistentes generar información e incorporarla a dichos lineamientos. Los facilitadores de estos talleres fueron Abel Atiti (Museos Nacionales de Kenia), Gail Bromley (Real Jardín Botánico de Kew, Reino Unido), Kathleen Gordon (Consultora, Australia), Bill Graham Jardines Botánicos de Birmingham, Reino Unido), Edelmira Linares (UNAM, México), Dawn Sanders (Jardín Botánico de Chelsea, Reino Unido), A. E. Shanavaskhan (Instituto de Investigación y Jardín Botánico Tropical,India) y Rachel Smith (Universidad de Birmingham, Reino Unido). BGCI les extiende a todos ellos su más sincero agradecimiento donar parte de su tiempo para el desarrollo de los lieneamientos de educación para la sustentabilidad los cuales sirvirán de base a los jardines botánicos para centrar su atención en aspectos holísticos de la sustentabilidad. Involucrándonos nosotros mismos en este proceso, identificando situaciones referentes a este concepto en los jardines botánicos, fomentando la educación para la sustentabilidad, participando críticamente durante el proceso de desarrollo, BGCI y sus miembros pueden producir un documento práctico que se adapte a las necesidades individuales de cada jardín

■ News

The British Council Morocco generously sponsored UK experts to take part in a three day conference on environmental Education in North Africa

Strategic Planning in North Africa

The British Council in Morocco has recently provided support to help Moroccan botanic gardens develop their environmental education programmes. A three day conference entitled 'Environmental Education in North Africa – What Perspectives for Botanic Gardens?' was held in Rabat in February. The council sponsored BGCI's Education Officer, Lucy Sutherland, Consultant John Huckle, and Christine Preston, Education Officer from Cambridge University Botanic Garden, to attend and present papers. Presentations from Gaud Morel (Museum National D'Histoire Naturelle, Paris, France), Francisco Villamandos (Jardin Botanico de Cordoba, Spain) and Francesco Raimando (Jardin Botanique de Palerme, Italy) ensured that a range of perspectives and approaches to environmental education were included.

After the conference, Lucy Sutherland and Gaud Morel conducted a training course in Rabat for Moroccan and Tunisian botanic garden staff. The course focused on strategic approaches to planning, developing and implementing interpretation and education programmes in botanic gardens. The British Council in Morocco kindly sponsored the training course.

▲ Nouvelles

ateliers du congrès. Un projet sera mis en circulation auprès des membres et sera accessible sur site web du BGCI dans les prochains mois, pour avis.

Planification Stratégique en Afrique du Nord

Le British Council du Maroc a récemment procuré des moyens pour aider les jardins botaniques du Maroc à développer leurs programmes d'éducation à l 'environnement. Une conférence de trois jours intitulée ' L'éducation à l'environnement en Afrique du Nord-Quelles perspectives pour les jardins botaniques? ' s'est tenue à Rabat en février. Le council a sponsorisé le responsable de l'éducation du BGCI, Lucy Sutherland, le consultant John Huckle et Christine Preston du Jardin Botanique de l'Université de Cambridge pour qu'ils assistent à la conférence et fassent une présentation. Des présentations de Gaud Morel (Muséum National d'Histoire Naturelle de Paris, France), Francisco Villamandos (Jardin Botanique de Cordoue, Espagne) et Francisco Raimondo (Jardin Botanique de Palerme, Italie) ont permis de présenter un large éventail de perspectives et d'approches de l'éducation à l'environnement.

Après la conférence, Lucy Sutherland et Gaud Morel ont assuré une formation à Rabat pour les personnels des jardins botaniques du Maroc et de Tunisie. Cette formation a traité des approches stratégiques de planification, développement et mise en place de programmes d'interprétation et d'éducation dans les jardins botaniques. Le British Council du Maroc a aimablement financé cette cession de formation.

Actes du Congrès

Le BGCI et le TBGRI ont pour mission de réaliser les actes du 4ème Congrès pour l'Education dans les Jardins Botaniques pour mai-juin 2000. Les actes du Congrès comprendront la plus grande partie des discours, les interventions et les présentations des ateliers qui ont abordé 5 thèmes : Education au Développement Durable; Développer une Éthique de l'Éducation

● Noticias

Julia Willison, Jefe de Educación de BGCI, está escribiendo los lineamientos utilizando el material obtenido de los talleres del congreso. En los próximos meses empezará a circular el primer borrador el cual igulamente podrá ser revisado en le sitio web de BGCI.

Planeación Estratégica en el Norte de Africa

El Consejo Británico en marruecos recientemente otorgó un apoyo para que los jardines botánicos marroquíes puedan desarrollar sus programas de educación ambiental. El coloquio 'Educación ambiental en el Norte de Africa – qué perspectivas hay para los jardines botánicos?' se llevó a cabo en Rabat en febrero. El Consejo patrocinó la asistencia de la directora de educación de BGCI Lucy Sutherland, al Consultor John Huckle y a Christine preston del Jardín Botánico de la Universidad de Cambridge.Otros particiapntes fueron Gaud Morel (Museo nacional de Histori Natural, París, Francia), Francisco Villamandos (Jardín Botánico de Córdoba, España) y Francesco Raimando (Jardín Botánico de Palermo, Italia) quienes con sus conferencias contribuyeron a ampliar el rango de perspectivas y aproximaciones en educación ambiental.

Posterior al coloquio, Lucy Sutherland y Gaud Morel dieron un curso de capacitación para personal de jardines botánicos de Marruecos y Túnez. El curso se centró en enfoques estratégicos para la planeación, desarrollo e implementación de interpretación y programas de educación en jardines botánicos. El curso se dio gracias al gentil apoyo del Consejo Británico de Marruecos.

Memorias del Congreso

BGCI y TBGRI están próximos a publicar las memorias del 4eme Congreso Internacional de Educación en Jardines Botánicos en el o toño del 2000. Las memorias incluyen la mayoría de las ponencias magistrales, presentaciones orales y talleres que abordaron los cinco temas del congreso: Educación para la

Left: Participants from Morocco and Tunisia attending the 3 day conference on Environmental Education in North Africa held in Morocco

■ News

Right: Dr Sreekandan Nair, (Director) and Dr Jacob Thomas (left) from the Tropical Botanical Garden and Research Institute discuss the fine details of producing the proceedings from the India congress

Congress Proceedings

BGCI and TBGRI are aiming to release the proceedings from the 4th International Congress on Education in Botanic Gardens in Autumn 2000. The congress proceedings will include the majority of keynote addresses, paper and workshop presentations that focussed on the five congress themes: Education for Sustainability, Development Education and Environmental Ethics, Beyond the Limits: Rural and Community Outreach, Teaching our Traditions – Medicinal Plants and Ethnobotany and New Trends in Science Education. Upon printing, the proceedings will be sent to all congress delegates. For further information contact: Dr Jacob Thomas, Tropical Botanic Garden and Research Institute Pacha Palode Thiruvananthapuram 695 562 India Fax: (91) 472 869646.

Far Right: School children visiting the Biodiversity Conservation exhibition organised by Shenzhen Fairy Lake Botanic Garden

CHINA

Promoting Biodiversity Conservation

Several young people from Shenzhen Fairy Lake Botanic Garden recently organised an exhibition entitled 'Promoting Biodiversity Conservation'. More than 1000 students and visitors visited the exhibition and many asked questions about biodiversity conservation. Each person received a souvenir set of 4 bookmarks, all of which were in the shape of different leaves aimed at demonstrating plant biodiversity.

Below: Bookmarks in the shape of leaves illustrate plant biodiversity and are a lovely souvenir for people visiting the exhibition organised by Shenzhen Fairy Lake Botanic Garden

▲ Nouvelles

à l'environnement; Dépasser les Clivages : Urbain/Rural; Enseigner Nos Traditions-Les Plantes Médicinales et l'Ethnobotanique et Les Nouvelles Tendances de l'Éducation. Dès leur impression, les actes seront envoyés à tous les congressistes. Pour plus d'informations, contacter : Dr Jacob Thomas, Tropical Botanic Garden and Research Institute Pacha Palode, Thiruvananthapuram 695 562 Inde Fax : (91) 472 869646.

CHINE

Promouvoir la Conservation de la Biodiversité

Plusieurs jeunes du Jardin Botanique Shenzen Fairy Lake ont organisé récemment une exposition intitulée " Promouvoir la conservation de la biodiversité ". Plus de 1000 étudiants et autres visiteurs ont visité l'exposition en posant beaucoup de questions sur la conservation de la biodiversité. Chaque visiteur de l'exposition a reçu un souvenir, constitué de 4 marque-pages, chacun en forme de différentes feuilles pour montrer la diversité des plantes. Pour plus d'informations, contacter : Feng Huiling Shenzen Fairy Lake Botanic Garden, Liantang, Shenzen 518004 P.R. Chine
Tel : (86)0 755 573 6614
Fax : (86)0 755 573 6917.

Une Réserve Naturelle Éducative au Jardin Botanique de Nanjing

Situé à la limite nord du Jardin Botanique de Nanjing, une réserve naturelle éducative (20ha) ouvre une fenêtre sur l'environnement naturel autant qu'une nouvelle scène attractive dans le jardin.

Cette réserve, aménagement inhabituel dans les jardins botaniques chinois, a été créée en 1998 grâce à un partenariat exceptionnel entre le Jardin Botanique de Nanjing et le British Council, avec l'aide d'un expert du London Ecology Unit. Composé de boisements mixtes, la réserve naturelle est un refuge et un abri pour de nombreuses plantes et animaux typiques de la région des Purples Mountain. Le très bel environnement

● Noticias

Sustentabilidad, Educación para el Desarrollo y Etica Ambiental, Más allá de Los Límites: Deasarrollo Rural y Comunitario, Enseñando Nuestras Tradiciones: Plantas Medicinales y Etnobotánica y Nuevas Tendencias en Educación de la Ciencia. Una vez impresas, las memoria se enviarán a todos los delegados que asistieron al congreso. Para mayor información contactar a Dr Jacob Thomas, Tropical Botanic Garden and Research Institute Pacha Palode Thiruvananthapuram 695 562 India Fax: (91) 472 869646.

CHINA

Propaganda sobre Conservación de la Biodiversidad

Varios jovenes del Jardín Botánicos del Lago Shenzhen Fairy organizaron recientemente la exposición 'Propaganda sobre conservación de la Biodiversidad'. Más de 1000 visitantes y estudiantes asisitieron a la exposición y muchos de ello hicieron interesantes preguntas sobre la conservación de la biodiversidad. Cada visitante recibió como recuerdo de la exposición un juego con cuatro separadores de lectura de diferentes formas de hojas que contribuyen a mostrar la diversidad vegetal. Para mayor información contactar a Feng Huiling, Jardín Botánico del Lago Shenzen Fairy, Liantang, Shenzhen 518004 República Popular China.
Tel: (86)0 755 573 6614
Fax: (86) 0 755 573 6917.

Una Reserva Natural Educativa en el Jardín Botánico de Nanjing

Hacia el límite nor-central del Jardín Botánico de Nanjing, una reserva

■ News

For further information contact: Feng Huiling Shenzhen Fairy Lake Botanic Garden, Liantang, Shenzhen 518004 P.R. China Tel: (86) 0 755 573 6614 Fax: (86) 0 755 573 6917.

An Educational Nature Reserve within Nanjing Botanical Garden

Located towards the north-central boundary of Nanjing Botanical Garden, an educational nature reserve (20ha) provides a window to the natural environment as well as a new scenic attraction in the garden.

This reserve, unusual in Chinese botanic gardens, was set up in 1998 through a unique partnership between Nanjing Botanical Garden and the British Council, employing the expert advice of the London Ecology Unit. Composed of mixed woodland, the nature reserve provides a safe and secure refuge to many plants and animals typical to the Purple Mountain Area. The excellent natural environment, facilities and the availability of a scientific guide make the nature reserve an ideal place for school groups to visit and learn from nature.

One important facility in the reserve is the nature trail, which includes stopping points selected to highlight the reserve's major features of ecological interest. For example in the Pine Woodland visitors may see Hwamei, one of China's best known birds; distinctive by its strikingly attractive white eyebrow.

Through activities like plant identification, bird watching, insect collection and pond dipping, visitors can begin to understand ecological principles like food chains, succession, and adaptation leading to an increased awareness of the complexity of the environment.

The nature trail is simply designed and a number on a tree or post marks each stopping point. Red and white bands on the trees ensure that the visitors can't get lost! The numbered points along the trail link with information

▲ Nouvelles

naturel, les aménagements et les compétences d'un guide scientifique font de la réserve naturelle un lieu de visite et d'étude de la nature idéal.

Un des aménagements importants dans la réserve est le sentier nature, jalonné de points d'arrêt sélectionnés pour leur intérêt écologique et pédagogique. Par exemple dans la forêt de pins, les visiteurs peuvent voir Hwamei, l'un des oiseaux les plus connus de Chine, reconnaissable à ses séduisants sourcils blancs.

Par le bais d'activités telles que l'identification de plantes, l'observation d'oiseaux, la collecte d'insectes et l'étude de la mare, les visiteurs peuvent commencer à comprendre les principes écologiques, tels que les chaînes alimentaires ou l'adaptation, aboutissant à une plus grande prise de conscience de la complexité de l'environnement.

Le sentier nature est tracé avec simplicité et un numéro sur un arbre ou un poteau marque chaque point d'arrêt. Des bandes rouges et blanches sur les arbres garantissent que les visiteurs ne peuvent pas se perdre! Les

● Noticias

natural educativa de 20 hectáreas ofrece una ventana hacia el ambiente natural así como una nueva atracción escénica en el jardín.

Esta reserva, poco común en los jardines botánicos chinos, se inició en 1998 a través de un convenio entre el Jardín Botánico Nanjing y el Consejo Británico con la asesoría de la Unidad de Ecología de Londres. La reserva, formada por un bosque mixto, es refugio de muchas plantas y animales nativos del área de la Montaña Púrpura. Este excelente ambiente natural así como sus servicios y guías científicos hace de la reserva un lugar ideal para que los grupos escolares aprendan sobre la naturaleza.

Uno de los aspectos más importantes de la reserva es el sendero de la naturaleza, el cual comprende paradas que destacan las características ecológicas más interesantes. Por ejemplo, en el bosque de pinos los visitantes pueden observar al Hwamei, una de las aves más comunes de China la cual se caracteriza por una peculiar y atractiva ceja de color blanco.

Left: The Pond Dipping Platform in the Nature Reserve within Nanjing Botanical Garden (Photographer Tiam Songhu)

■ News

presented in a leaflet and an interpretive sign addresses litter, the lighting of fires and the need to respect wildlife. Along the trail there are also several outdoor classrooms, a bird-viewing hide and a pond access platform.

For students who live in a large city full of buildings and vehicles, the nature trail provides a rare chance for them to see and hear the wonders of the natural environment. For further information contact: Li Mei, Head of Education Department, Nanjing Botanical Garden Mem.Sun Yat-sen, P.O. Box 1436, Nanjing P.R. China.
Tel: (86) 25 443 2075
Fax: (86) 25 443 2074.
Email: jsszzzzz@public1.ptt.js.cn

Right: Students visiting the Nature Reserve within Nanjing Botanical Garden (Photographer Tiam Songhu)

BELGIUM

The Hamamelis Festival

The Hamamelis Festival 2000 held at The Arboretum Kalmthout celebrates the amazing winter flowering of Witch Hazel. The garden opens its gates for three weeks during winter for people to flock in and see this spectacular collection which has been flowering seasonally for over 30 years. Special guided tours are conducted and the Arboretum takes group bookings. For further information contact: Arboretum Kalmthout v.z.w., Heuvel, 2, B-2920 Kalmthout Belgium.

FRANCE

When Botanists Became Activity Leaders

A bus arrived returning 55 children from the surrounding peat bogs. They were a bit tired and excited, but enriched by the information provided throughout the day by some 60 specialists in the flora of these very special places.

▲ Nouvelles

points numérotés sur le circuit correspondent à des informations figurant dans une brochure et il existe des pictogrammes concernant les détritus, l'allumage de feux et la nécessité de respecter la vie sauvage. Le long du circuit, il y a également plusieurs classes en plein air, un observatoire d'oiseaux et une plate-forme d'accès à une mare.

Pour les élèves qui vivent dans une grande ville remplie de constructions et de voitures, le sentier nature offre une rare opportunité pour eux de voir et entendre les merveilles de la nature. Pour plus d'informations, contacter : Li Mei, Head of Education Department, Nanjing Botanical Garden Mem. Sun Yat-sen, P.O. Box 1436, Nanjing P.R. China Tel : (86)25 443 2075
Fax : (86) 25 443 2074
Email : jszzzzz@public.1.ptt.js.cn

BELGIQUE

Le Festival des Hamamelis

Le Festival des Hamamelis 2000 qui s'est tenu à l'Arboretum de Kalmthout célèbre l'étonnante floraison hivernale des hamamelis. Les jardins ouvrent leurs portes pendant trois semaines en hiver pour que le public se précipite et voie cette collection spectaculaire qui a fleuri chaque année depuis plus de 30 ans. Des visites guidées spéciales sont organisées et l'Arboretum reçoit aussi les groupes sur rendez-vous. Pour plus d'informations, contacter : Arboretum de Kalmthout v.z.w., Heuvel, 2, B-2920 Kalmthout, Belgique.

FRANCE

Quand les Botanistes Deviennent des Animateurs

Un bus ramène 55 enfants des tourbières des environs. Un peu fatigués, un peu exités mais plus riches des informations distillées toute la journée par quelques 60 spécialistes de la flore de ces milieux si spécifiques.

Mais rassembler 120 personnes dans un contexte éducatif de mande de la préparation. Sous l'impulsion de Joël Klutsch du service 'plantes' des

● Noticias

A través de actividades como identificación de plantas, observación de aves, colecta de insectos y observaciones en el estanque, los visitantes comprenden algunos principios ecológicos como cadenas alimenticias, sucesión y adaptación ayudando a concientizar al público sobre la complejidad del ambiente.

El sendero de la naturaleza es muy simple. Las marcas son números que se encuentran en postes o sobre los árboles y marcan las diferentes paradas. Unas bandas rojas y blancas marcan el camino para que los visitantes no se pierdan. Los números de las paradas del sendero están ligados a la información de un folleto. Otros letreros explican aspectos sobre la hojarasca, el fuego y la necesidad del respeto a la vida silvestre. A lo largo del sendero, también hay varios salones de clase al aire libre, escondites para observar aves y una plataforma que da acceso al estanque.

Para los estudiantes que viven en una ciudad grande llena de edificios y vehículos, el sendero de la naturaleza brinda una oportunidad para acercarse a las maravillas del mundo natural. Para mayor información contactar a: Li Mei, Jefe del Departamento de Educación del Jardín Botánico de Nanjing. Mem. Sun Yat-sen, P.O. Box 1436, Nanjing, R.P. China.
Tel: (86)25 443 2074.
Email: jsszzzzz@public1.ptt.js.cn

BÉLGICA

El Festival del Hamamelis

El Festival del Hamamelis 2000 del Arboretum Kalmthout celebra la sorprendente floración de la Bruja Hazel. Los jardines abren sus puertas diariamente durante el invierno para que la gente pueda ver esta espectacular colección que ha estado floreciendo estacionalmente por más de 30 años. Se ofrecen visitas guiadas especiales así como reservaciones para grupos. Para mayor información contactar a: Arboretum Kalmthout v.z.w., Heuvel, 2, B-2920 Kalmthout Belgium.

■ News

Getting 120 people together in an educational context is a challenge! Under the impetus of Joel Klutsch, from the Yves Rocher Company, preparation began in April last year in Frasne where a meeting was held with a group of enthusiastic teachers. During the meeting an initial framework for the event was designed followed by the development of a pupil worksheet. By September the planning was complete.

The activity involved the scientists taking children on a guided walk. The children looked, observed, drew and took notes of their discoveries as they explored the living peat bog. For two hours they were shown sundews, swerties, willows, birches and a lot of other things besides. Nearing the end of the day the children were able to report back on what they had learned.

The day's events were over but had the objectives been achieved? In terms of acquiring knowledge, through exploration the pupils had developed an understanding of the environment and learnt the name of plants; in terms of skill acquisition they had looked in order to draw, observe and compare; in terms of learning how to behave they had to ask questions and show respect for plants and the environment. The day certainly benefited everyone, and

▲ Nouvelles

établissements Yves Rocher celle-ci a commencé les 15 et 16 avril à Frasne par une rencontre avec les enseignants (très disponibles) et une visite du site (sous la neige). Une première trame d'animation voit le jour suivie par la rédaction d'une fiche de travail. En septembre, le planning de la journée était retenu.

Les scientifiques ont accompagné les enfants sur le terrain pour une visite guidée. Les enfants ont regardé, observé, dessiné et pris des notes durant leur visite de la tourbière découvrant des droseras, canneberges et pins à crochets… A la fin de la journée les enfants purent, grâce au transect dessiné sur du papier, placer leurs découvertes.

La journée d'animation est terminée. Mais les objectifs auront-ils été atteints? En terme d'acquisition de connaissances, les élèves ont pu découvrir et comprendre un milieu, apprendre les noms des plantes. En terme d'acquisition de savoir faire, ils ont du regarder pour dessiner, observer pour comparer. En terme d'acquisition de savoir-être, ils ont du se montrer curieux, respecter les plantes, le milieu. Alors oui assurément la journée a été profitable à tous et le travail d'exploitation ne fait que commencer. Mais au delà de cela, il fallait voir la mine réjouie des enfants traduisant le plaisir qu'ils avaient eu au contact de ce monde des plantes.
For further information contact: Joel Klutsch Laboratoires de Biologie Végétale, Yves Rocher, Service Botanique, La Croix des Archers, 56201 La Gacilly Cedex, France.
Tel: (33) 2 9908 3767
Fax: (33) 2 9908 2874.

KENYA

En Descendant les Allées du Jardin

Les Amis de l'Arboretum de Nairobi et du Muséum National du Kenya ont travaillé ensemble pour mener un atelier pour les enseignants des écoles primaires de Nairobi. L'atelier 'En descendant les allées du jardin' donne aux participants l'occasion d'échanger

● Noticias

FRANCIA

Cuando los Botánicos Dirigen las Actividades

Un autobús regresó de las turberas cercanas con 55 niños. Están un poco cansados y excitados, pero llenos de rica información que les dieron durante el día unos 60 botánicos especialistas en la flora de estos lugares tan especiales.

Above and Left: Children explore and draw their peat bog discoveries during activities organised by the Yves Rocher Company

¡Juntar a 120 personas en un contexto educativo es todo un reto! Con el ímpetu de Joel Klutsch, de la Compañía Yves Rocher, todo comenzó a prepararse en abril del año pasado en Frasne con un grupo de maestros muy entusiastas. Durante esta reunión, se desarrolló un marco de trabajo para el evento así como hojas de trabajo para los alumnos. Hacia septiembre la planeación estaba completa.

La actividad involucraba a los científicos para llevar a los niños a una caminata guiada. Los niños hicieron observaciones, dibujaron y tomaron notas de sus descubrimientos mientras exploraban la vida de la turbera. Durante dos horas les mostraron las droseras, sauces y arces y muchas otras cosas más. Al final del día, los niños eran capaces de comentar sobre lo que habían aprendido.

Lo planeado para el día se realizó, pero ¿se cumplieron los objetivos? En términos de aprendizaje, a través de la exploración los niños comprendieron sobre su entorno y aprendieron.

■ News

the work based on it has only just begun. But more than that were the children's glowing faces and the expressions of pleasure that they had from their encounter with the world of plants. For further information contact: Joel Klutsch Laboratoires de Biologie Végétale, Yves Rocher, Service Botanique, La Croix des Archers, 56201 La Gacilly Cedex, France.
Tel: (33) 2 9908 3767
Fax: (33) 2 9908 2874.

KENYA

Down the Garden Path

The Friends of Nairobi Arboretum and the National Museums of Kenya have been working together to conduct a workshop for primary school teachers in Nairobi. The workshop 'Down the Garden Path' gave participants an opportunity to share ideas and develop strategies on integrating environmental education with the school curriculum. Participants also shared ideas and activities on using school grounds as learning resources. For further information contact: Abel Atiti, National Museums of Kenya Nairobi Botanic Garden PO Box 40658, Nairobi Kenya
Tel: (252) 2 742131
Fax: (254) 2 741424.

THE NETHERLANDS

Gardens of Ogham

Hortus Haren has developed a Celtic garden called the 'Gardens of Ogham'. This one ha. garden is based on the mythological side of the Celtic culture. For further information contact: Judith Boeijink, Hortus Haren, Postbus 179, 9750 AD Haren, The Netherlands.

SOUTH AFRICA

BEEP

The Green Trust (WWF) provides funds to the Southern Cape Herbarium and Garden Route Botanical Garden. The trust is funding a 3-year project called the Botanical and Environmental Education Project, better known as 'BEEP'. BEEP runs a teachers' outreach project which involves three part-time facilitators working with a core group of teachers to help them

▲ Nouvelles

des idées et de développer des stratégies sur l'intégration de l'éducation à l'environnement dans les programmes scolaires. Les participants échangent également leurs idées d'activités sur l'utilisation du terrain de l'école comme ressource pour l'enseignement. Pour plus d'informaytion, contacter: Abel Atiti, National Muséums of Kenya Nairobi Botanic Garden PO Box 40658, Nairobi Kenya Tel : (252) 2 742131
Fax : (254) 2 741424.

PAYS BAS

Les Jardins de Ogham

Horus Haren a développé un jardin celtique appelé 'Jardin de Ogham'. Ce jardin de 1 ha est basé sur l'aspect mythologique de la culture celtique. Pour plus d'information, contacter: Judith Boeijink, Hortus Haren, Postbus 179, 9750 AD Haren, The Netherlands.

AFRIQUE DU SUD

BEEP

Le Green Trust (WWF) procure des financements à l'Herbier de Southern Cape et au Jardin Botanique Route. Le trust a fondé un projet d'une durée de 3 ans, appelé le Projet d'Education à la Botanique et à l'Environnement, plus connu sous le nom de BEEP. Le BEEP englobe plus que des projets d'enseignants; trois médiateurs à temps partiel travaillent avec un noyau d'enseignants pour les aider à utiliser les plantes et l'environnement dans leur programme de cours, dans le cadre du nouveau Outcomes Based Education (OBE) Syllabus 2005.

Le nouveau OBE est basé sur de bons principes et propose aux enseignants un choix important de sujets et de façons de les présenter, ce qui leur permet d'utiliser les plantes et l'environnement de façons très diverses. Cela contraste avec le jargon et la terminologie utilisée habituellement dans les manuels et qui ont été un obstacle pour les enseignants qui devaient les comprendre et les mettre en pratique.

● Noticias

nombres de las plantas; en términos de habilidades, aprendieron a observar para dibujar y comparar, en cuanto a su comportamiento planteaban preguntas y mostraron respeto hacia las plantas y el ambiente. El día aportó beneficios a todos, y el trabajo basado en el campo apenas se iba a iniciar. Pero lo mejor de todo eran las caritas relucientes y las expresiones de felicidad conforme descubrán el mundo de las plantas. Para mayor información contactar a: Joel Klutsch, Laboratorios de Biología Vegetal, Yves Rocher, Servicio Botánico, La Croix des Archers, 56201 La Gacilly Cedex, France.
Tel: (33) 2 9908 3767
Fax: (33) 2 9908 2874.

KENYA

El Sendero del Jardín

Los Amigos del Arboretum de Nairobi y de los Museos Nacionales de Kenya han estado trabajando juntos para dar un taller para maestros de primaria en Nairobi. El taller 'El Sendero del Jardín' daba a los participantes la oportunidad de compartir ideas y desarrollar estrategias para integrar la educación ambiental en la curricula escolar. Los participantes también compartieron ideas y actividades para utilizar los patios de las escuelas como recurso de aprendizaje. Para mayor información contactar a: Abel Atiti, Museos Nacionales de Kenya y Jardín Botánico de Nairobi PO Box 40658, Nairobi Kenya Tel: (252) 2 742131
Fax: (254) 2 741424.

HOLANDA

Jardines de Ogham

El Jardín Horus Haren desarrolló el jardín Celta 'Jardines de Ogham'. Este jardín de una hectárea está basado en la mitología de la cultura Celta. Para mayor información contactar a: Judith Boeijink, Hortus Haren. Postbus 179, 9750 AD Haren, Holanda.

SUDAFRICA

BEEP

El Fideicomiso Verde (WWF) brinda apoyo al Herbario de Southern Cape y al Jardín Botánico Garden Route.

■ News

use plants and the environment for their learning programmes in the new Outcomes Based Education (OBE) Syllabus 2005.

The new OBE is very good in principle and gives teachers free choice of subject and manner of presenting it, which allows them to use plants and the environment in so many different ways. However the jargon and terminology used in the manuals has been difficult for disadvantaged teachers to understand and put into practice.

Consultant Ally Ashwell, formerly with National Botanical Institute Kirstenbosch, has been conducting workshops for the facilitators, as well as the core group of teachers from a wide range of schools, in order to try and give them an insight as to how to implement the syllabus. The three facilitators are keeping in regular contact with the teachers and assisting them with making use of the resources which the herbarium has provided i.e. posters, magazines and information.

In the following term, the teachers and facilitators will come together again and workshop their results and Ally will co-ordinate the production of a manual aimed at Foundation Phase Teachers (Grades 1 to 3). This manual will be 'co-authored' by the teachers, the facilitators, and especially the learners (children), and the first-term activities and drawings will be used to illustrate it. The herbarium staff hope to produce similar manuals for other grades over the next 2 years, and at the same time, work with different teachers. The practical projects that have resulted from BEEP include making gardens at the schools, clearing and reviving natural areas and/or wetlands, and field trips into natural areas to see how important plants are in our environment. For further information contact:
Yvette van Wijk, Southern Cape Herbarium and Garden Route Botanical Garden, PO Box 564, George 6530 South Africa.
Email: scherb@pixie.co.za

▲ Nouvelles

Le consultant Ally Ashwell, auparavant à l'Institut Botanique National de Kirtenbosh, a mené des ateliers pour les médiateurs, ainsi que pour le noyau d'enseignants issus de diverses écoles afin d'essayer de leur donner l'esprit qui rende opérationnel le programme. Les trois médiateurs sont en contact régulier avec les enseignants et les aident à utiliser les ressources que l'herbarium met à leur disposition, telles que les posters, les magazines et les informations.

Lors de l'étape suivante, les enseignants et les médiateurs vont se rencontrer et mettre en commun leurs résultats et Ally va coordonner la production d'un manuel destiné à la Fondation Phase Teachers (grades 1 à 3). Ce manuel sera co-signé par les enseignants, les médiateurs mais aussi les élèves (enfants), et la première étape de l'activité et des séances de dessin sera utilisée à l'illustrer. Le personnel de l'herbarium espère produire des manuels similaires pour les autres grades dans les deux années à venir, tout en travaillant avec différents enseignants. Les projets concrets qui ont résulté du BEEP sont par exemple la réalisation de jardins dans les écoles, le nettoyage et la remise en état d'aires naturelles et/ou de milieux humides et des sorties sur le terrain dans des milieux naturels, pour voir l'importance des plantes dans notre environnement. Pour plus d'informations, contacter: Yvette van Wijk, Southern Cape Herbarium and Garden Route Botanical Garden, PO Box 564, George 6530 South Africa.
Email : scherb@pixie.co.za

Faire des Jardins 'Naître à la Vie'

Une partie des activités actuelles du SABONET (Southern African Botanical Diversity Network) dans les dix pays du sud de l'Afrique consiste à développer un manuel sur l'interprétation environnementale dans les jardins botaniques, spécialement conçu pour aider les jardins botaniques du sud de l'Afrique dans l'interprétation environnementale et la création de leur jardin 'Naître à la vie. Le manuel fera partie des publications Report Serie du

● Noticias

Left: Teachers sharing a joke, are delighted with the range of environmental posters available from the Southern Cape Herbarium, South Africa

El fideicomiso está financiando el proyecto de tres años de educación ambiental y botánica conocido por sus siglas 'BEEP'. El proyecto incluye coordinar un proyecto con un maestro, tres facilitadores de medio tiempo trabajan con un grupo de maestros para ayudarlos a utilizar las plantas y el ambiente en sus programas de aprendizaje en el nuevo sistema de educación (OBE) Syllabus 2005.

El nuevo OBE es muy bueno en principio y da a los maestros libertad para escoger el tema y la manera para presentarlo, lo cual les permite utilizar las plantas y su ambiente de muy variadas formas. Sin embargo, el lenguaje y la terminología de los manuales son de difícil comprensión para los maestros y por tanto dificultan la puesta en práctica.

La consultora Ally Ashwell, antes personal del Instituto Botánico Nacional de Kirstenbosch, ha dirigido talleres para los facilitadores, al igual que el grupo central de maestros de un amplio rango de escuelas, para probar y poner en práctica el syllabus. Los tres facilitadores siguen en contracto con los maestros y los asesoran en el uso del material proporcionado por el herbario como carteles, revistas e información.

El próximo trimestre, nuevamente se reúnen los maestros y facilitadores analizando en un taller los resultados. Ally coordinará la elaboración de un manual dirigido a Maestros de la Fase de Fundación (Grados 1 a 3). Los coautores del manual serán los maestros capacitados, los facilitadores, y especialmente los aprendices (niños). Las actividades y dibujos realizados en el primer trimestre se usarán para

■ News

▲ Nouvelles

● Noticias

Right: Julie Carlisle, BEEP facilitator from Oudtshoorn, during a teacher workshop at the Southern Cape Herbarium, South Africa

Above: A new practical guide to interpretation in botanic gardens produced by SABONET

Making Gardens 'Come Alive'

As part of the SABONET (Southern African Botanical Diversity Network) activities, within the ten countries of southern Africa, the organisation has develop a manual on environmental interpretation in botanic gardens. The manual is specifically geared towards assisting the botanic gardens of southern Africa in environmental interpretation and helping them to

SABONET et est préparé pour le SABONET par Maryke Honig, qui a travaillé plusieurs années à l'Institut Botanique National de Kirstenbosch en Afrique du Sud. A Kirstenbosch, Maryke a développé un excellent matériel d'interprétation pour les huit jardins botaniques de l'Institut Botanique National. Il est envisagé que la sortie de cette utile publication coincide avec le Congrès Mondial des Jardins Botaniques à Asheville, en Caroline du Nord aux Etats Unis en Juin 2000. Pour plus d'informations, contacter: Christopher Willis, coordinateur régional de SABONET, c/o National Botanical Institute, Private Bag X101, Pretoria 0001 Afrique du Sud.
Tel (27) 12 804 3200
Fax : (27) 12 804 3211.
E mail : ckw@nbipre.nbi.ac.za

ROYAUME UNI

La Poésie au Jardin

'La poésie au jardin' était un projet conjoint du conseil municipal de Birmingham et du Jardin Botanique et des Serres de Birmingham. Fondé par la Société de poésie le projet porte sur l'utilisation des plantes et de l'environnement pour stimuler la création poétique. La poétesse Eleanor Cooke a passé cinq jours au jardin botanique en tant qu'artiste résidente

ilustrarlo. El personal del herbario espera elaborar manuales similares para los otros grados durante los próximos 2 años, y al mismo tiempo, espera trabajar con diferentes maestros. Proyectos prácticos que han surgido del BEEP incluyen establecimiento de jardines en las escuelas, limpiea y rehabilitación de áreas naturales y/o humedales, y viajes de campo a áreas naturales donde se observa la importancia de las plantas en nuestro ambiente. Para mayor información contactar a: Yvette van Wijk, Southern Cape herbarium and Garden Route Botanical Garden, PO Box 564, George 6530 South Africa. Email: scherb@pixie.co.za

Dando Vida a los Jardines

Entre las actividades de 10 países de Sud Africa que forman parte del SABONET (Red de Diversidad Botánica Sudafricana), la organización ha desarrollado un manual de interpretación en jardines botánicos, específicamente para desarrollar la interpretación ambiental y así 'darle vida' a sus jardines. El manual se publicó como parte de una Serie de Informes de SABONET, y estaba preparado por SABONET por Maryke Homnig, quien trabajó durante varios años en el Instituto Nacional de Botánica de Kirstenbosch en Sud Africa. Como parte de su trabajo en Kirstenborsch Maaryke desarrolló un excelente material de interpretación para los ocho jardines botánico pertenecientes al Instituto. Esta publicación coincida con el Congreso Mundial de Jardines Botánicos en Asheville, Carolina del Norte, USA en junio del 2000. Para más información contactar a: Christopher Willis, SABONET Regional Coordinator, c/o National Botanical Institute, Private Bag X101, Pretoria 0001 Sud Africa.
Tel: (27) 12 804 3200
Fax: (27)12 804 3211.

REINO UNIDO

¡Recorriendo el sendero del Jardín con poesía!

'El sendero del Jardín' fue un proyecto conjunto entre el Ayuntamiento de la ciudad de Birmingham y el Jardín

■ News

make their gardens 'come alive'. The manual has been published as part of the SABONET Report Series, and was prepared by Ms Maryke Honig, who worked for several years at the National Botanical Institute Kirstenbosch in South Africa. As part of her work at Kirstenbosch, Maryke developed excellent environmental interpretation material for the National Botanical Institute's eight national botanical gardens. This useful publication was published to coincide with the World Botanic Gardens Congress in Asheville, North Carolina, USA held in June 2000.
For further information contact: Christopher Willis, SABONET Regional Coordinator, c/o National Botanical Institute, Private Bag X101, Pretoria 0001 South Africa.
Tel: (27) 12 804 3200
Fax: (27) 12 804 3211.
E-mail: ckw@nbipre.nbi.ac.za

UNITED KINGDOM

Going Down the Garden Path with Poetry!

'Down the Garden Path' was a joint project between Birmingham City Council and The Birmingham Botanical Gardens and Glasshouses. Funded by the Poetry Society, the project focused on using plants and environment as the stimulus for creative poetry. Poet Eleanor Cooke, spent 5 days as an artist in residence in the botanical gardens with pupils and teachers from four Birmingham schools. In October teachers spent a day in the gardens writing poetry with Eleanor and in the following month, students visited the gardens. The book produced after the project presents a selection of poems written by teachers and students and gives the reader a taste of the inspiration, skill and imagination that characterised this poetry in the botanical gardens. For further information contact: Bill Graham and Sue Bird, The Birmingham Botanical Gardens and Glasshouses, Westbourne Road, Edgbaston Birmingham B15 3TR U.K.
Tel: (44) 121 454 1860
Fax: (44) 121 454 7835.

▲ Nouvelles

en compagnie des élèves et des enseignants de quatre écoles de Birmingham. En octobre les enseignants ont passé une journée au jardin botanique à écrire de la poésie avec Eleanor et les élèves ont visité le jardin le mois suivant. Le livre édité ensuite présente un choix de poêmes écrits par les enseignants et les élèves. Il donne au lecteur une idée de l'inspiration, des dons et de l'imagination qui apparaissent dans la poésie créée au jardin botanique. Pour plus de renseignements adressez-vous à: Bill Graham and Sue Bird, The Botanical Garden and Greenhouses, Westbourne Road, Edgbaston, Birmingham B15 3TR U.K.
Tél: (44) 121 454 1860
Fax: (44) 121 454 7835.

Un Jardin Pharmaceutique

La moitié des 25 produits pharmaceutiques les plus vendus dans le monde ont leur origine dans la nature. La photographe en résidence à Chelsea Physic Garden, Sue Snell, a saisi sur la pellicule environ 30 plantes salvatrices. Elles seront montrées en même temps que des portraits de personnes qui ont consenti à louer les bienfaits de leurs traitements. L'exposition de cet été (9 juillet- 3 septembre) s'associera au lancement d'un jardin pharmaceutique qui en sera l'illustration vivante. On y regroupera des plantes utilisées en oncologie, cardiologie, dermatologie, analgésie, neurologie et psychiatrie pour n'en citer que quelques-uns.

Cette exposition mettra en lumière l'existence de notre dette envers le monde de la nature et notre dépendance pour la santé de tous les jours. Pour plus de renseignements s'adresser à: Sue Minter, Chelsea Physic Garden, 66 Royal Hospital Road, London SW3 4HS U.K.
Tél: (44) 20 7352 5646
Fax: (44) 20 7376 3910.

Acquisition d'une Expérience Pratique et d'un Diplôme

Le jardin botanique de l'Université de Dundee a mis sur pied un cours préparatoire à un diplôme pour ceux qui souhaitent maintenant se constituer une expérience pratique avant de

● Noticias

Botánico e Invernaderos de Birmingham. Fundado por la Sociedad de la poesía, el proyecto se basó en las plantas y sus ambientes para estimular la creatividad poética. La poeta Eleanor Cooke pasó 5 días como artista residente del jardín botánico con alumnos y maestros de cuatro escuelas de Birmingham.
En octubre los maestros pasaron un día en los jardines escribiendo poesía con Eleanor, y en el mes siguiente, los estudiantes visitaron los jardines.
El libro producido a partir del proyecto, presenta una selección de poemas escritos por maestros y estudiantes brindando al lector una muestra de la inspiración, habilidad e imaginación que caracterizó su poesía en el jardín botánico. Para mayor información diríjase a: Bill Graham y Sue Bird, The Birmingham Botanical Gardens and Glasshouses, Westbourne Road, Edgbaston Birmingham B15 3TR U.K.
Tel: (44) 121 454 1860
Fax (44) 1211 454 7835.

Un Jardín Curativo

La mitad de los 25 productos farmacéuticos más vendidos son de origen natural. La fotógrafa residente Sue Snell del Jardín Físico de Chelsea ha fotografiado alrededor de 30 de estas plantas las cuales se exhibirán junto con retratos de personas que han aceptado recibir su tratamiento. Esta exposición de verano (9 de julio – 3 de septiembre, 2000) compartirá el lanzamiento del Jardín Farmacéutico como referencia viva para estas plantas. Se agruparán plantas empleadas en el desarrollo de medicamentos oncológicos, cardiológicos, dermatológicos, anestésicos y analgésicos, neurológicos y psiquiátricos, por nombrar algunos.

La exposición resaltará nuestra deuda para con el mundo natural y nuestra continua dependencia de éste para nuestro bienestar cotidiano. Para mayor información contactar a: Sue Minter, Chelsea Physic Garden, 66 Royal Hospital Road, London SW3 4HS U.K. Tel: (44) 20 7352 5646 Fax: (44) 20 7376 3910.

■ News

A Pharmaceutical Garden

Half the world's top 25 best-selling pharmaceuticals derive their origin from the natural world. Photographer in Residence, Sue Snell, at Chelsea Physic Garden, has captured the 30 or so life-saving plants involved, and these will be shown alongside portraits of people who have gladly consented to celebrate their treatment. This Summer Exhibition (9 July – 3 September 2000) will partner the launch of a Pharmaceutical Garden as a living reference to these plants. Grouped together will be plants used in the development of drugs for oncology, cardiology, dermatology, anaesthesia and analgesia, neurology and psychiatry, just to name a few.

This exhibition will highlight our existing debt to the natural world and continuing dependence on it for daily healthcare. For further information contact: Sue Minter, Chelsea Physic Garden, 66 Royal Hospital Road, London SW3 4HS U.K.
Tel: (44) 20 7352 5646
Fax: (44) 20 7376 3910.

Gaining Practical Experience and a Certificate!

The University of Dundee Botanic Garden and Grounds has developed a new certificate course designed for people who wish to gain practical experience prior to starting a formal course in horticulture or botany, or for those who have gained a qualification and now wish to improve their job prospects. The main aims of the Certificate of Voluntary Contribution are to allow a person to: gain horticultural experience within a botanic garden, appreciate the role of a fully documented plant collection and gain a stepping stone into a career working with plants. For further information contact: Alasdair Hood, University of Dundee Botanic Garden and Grounds, Riverside Drive, Dundee DD2 1QH U.K.
Tel: (44) 1382 566 939
Fax: (44) 1382 640 574.

Mobile Exhibition

A new mobile exhibition and poster has been designed by staff at the University of Oxford Botanic Garden

▲ Nouvelles

commencer un cours d'horticulture ou de botanique en bonne et due forme, ou pour ceux qui ont déjà une qualification et souhaitent améliorer leurs perspectives professionnelles.

Les principaux objectifs du 'Certificat de Contribution Volontaire' sont de permettre: d'obtenir une expérience dans le domaine de l'horticulture à l'intérieur d'un jardin botanique; de prendre conscience du rôle d'une collection de plantes parfaitement documentée; d'avoir un tremplin pour une carrière en rapport avec les plantes.

Pour plus de renseignements contacter: Alasdair Hood, University of Dundee Botanic Garden and Grounds, Riverside Drive, Dundee DD2 1QH U.K.
Tél : (44) 1382 566 939
Fax : (44) 1382 640 574.

Exposition Itinérante

Une nouvelle exposition itinérante et un poster s'adressant aux enfants des collèges ont été conçus par le personnel de l'Université du Jardin Botanique d'Oxford. Le thème de l'exposition et du poster tourne autour des usages économiques des différentes parties de la plante. Pour plus ample information contacter: Louise Allen, The University of Oxford Botanical Garden, Rose Lane, Oxford OX1 4AX U.K.
Tél/Fax : (44) 1865 276 920. Email: louise.allen@ botanic-garden.ox.ac.uk

Le Réseau Éducatif des Jardins Botaniques

Le réseau éducatif des jardins botaniques du Royaume Uni a récemment animé une journée de formation aux jardins botaniques royaux de Kew. La formation avait pour objet de répondre aux attentes des personnes ayant des besoins particuliers en pédagogie de l'environnement. Pour plus ample information contacter: BGEN Coordinator Tess Darwin Edwards c/o RBG Edinburgh, 20A Inverleith Row, Edinburgh EH3 5LR U.K.
Email: tee.darwin@alk21.com

● Noticias

¡Obteniendo experiencia práctica y un certificado!

La Universidad de los Jardines Botánicos de Dundee, ha desarrollado un nuevo curso diseñado para aquéllos que desean tener experiencia práctica antes de iniciar un curso formal en horticultura o botánica, o para quienes ya tienen ciertos estudios y desean mejorar sus perspectivas de trabajo. Los principales objetivos del Certificado de Contribución Voluntaria son: obtener experiencia en horticultura para un Jardín Botánico, reconocer la importancia de una colección documentada de plantas, e iniciar una carrera trabajando con plantas. Para mayores informes comunicarse con: Alasdair Hood, University of Dundee Botanic Garden and Grounds, Riverside Drive, Dundee DD2 1QH U.K.
Tel: (44) 1382 566 939
Fax: (44) 1382 640 574.

Exposición Móvil

El personal de la Universidad del Jardín Botánico de Oxford ha diseñado una nueva exposición móvil para niños de escuela secundaria. El tema principal de los carteles y la exposición es sobre el uso económico de diferentes partes de las plantas. Para mayores informes, dirigirse a: Louise Allen The University of Oxford Botanic Garden, Rose Lane, Oxford OX1 4AX U.K.
Tel/Fax: (44)18655 276 920 Email: louise.allen@botanic-garden.ox.ac.uk

BGEN

La Red de Educación en Jardines Botánicos del Reino Unido recientemente organizó un día de capacitación en el Real Jardín Botánico de Kew. El entrenamiento se centró en proporcionar técnicas para personas con necesidades especiales en educación al aire libre. Para mayores informes comunicarse con: Tess Darwin Edwards Coordinador de BGEN c/o Royal Botanic Garden Edinburgh, 20ª Inverleith Row, Edinburgh EH3 5LR U.K.
email: tee.darwin@talk21.com

Salir de Adentro y Entrar Afuera

El escultor John Thompson, Profesor Asociado en Arte Fino del Instituto Southampton, obtuvo una de las

■ News

targeting secondary school aged children. The theme of the exhibition and poster revolves around the economic uses of many different parts of the plant. For further information contact: Louise Allen, The University of Oxford Botanic Garden, Rose Lane, Oxford OX1 4AX U.K.
Tel/Fax: (44) 1865 276 920. Email: louise.allen@botanic-garden.ox.ac.uk

BGEN

The Botanic Gardens Education Network in the U.K. recently hosted a training day at the Royal Botanic Gardens Kew. The training focused on techniques for catering for people with special needs in outdoor environmental education. For further information contact: BGEN Coordinator
Tess Darwin Edwards c/o RBG Edinburgh, 20A Inverleith Row, Edinburgh EH3 5LR U.K.
email: tee.darwin@talk21.com

Inside Out and Outside In

Sculptor John Thomson, Associate Lecturer in Fine Art at the Southampton Institute, has been awarded one of Southern Art's residencies as part of the National Year of the Artist. The residency programme plans to take art and artists out of the traditional places usually associated with art, and place them in everyday situations more accessible to the general public.

John will be in residence at the Sir Harold Hillier Gardens and Arboretum for one year working on the project 'Inside Out and Outside In'. During his garden's residency, John will be working inside a solar powered greenhouse where he will be clearly visible to visitors. His work has often been inspired by the natural world and so John thinks that the gardens will provide a great venue for further research and the production of new works of art. The artworks will be gathered inside the greenhouse and ultimately the whole collection, including the greenhouse, will be relocated to a local art gallery to form an exhibition in late 2001. For further information contact: Mary South, The Sir Harold Hillier Gardens and

▲ Nouvelles

Dehors Dedans et Dedans Dehors

Le sculpteur John Thomson, assistant à l'Institut des Beaux-Arts de Southampton a été récompensé par le titre d'artiste résident de Southern Art (Art du Sud) dans le cadre de l'Année Nationale de l'Artiste qui commence en juin 2000. Le programme projette de sortir l'art et les artistes des lieux habituellement associés à l'art et de les mettre dans le monde de tous les jours, plus accessibles au public. John sera en résidence pendant un an dans les Jardins et l'Arboretum Sir Harold Hiller et travaillera sur le projet 'dedans dehors et dehors dedans'. Pendant sa résidence au Jardin, John travaillera dans une serre solaire où il sera parfaitement visble pour les visiteurs. Le monde naturel a souvent inspiré son oeuvre et John pense que les jardins seront une source féconde pour d'autres recherches et pour la création de nouvelles oeuvres d'art. Les oeuvres seront rassemblées dans la serre et finalement toute la collectiion, y compris la serre, sera réinstallée dans une galerie d'art du quartier pour une exposition fin 2001. Pour plus ample information contacter: Mary South, The Sir Harold Hallier Gardens and Arboretum, Jermyns Lane, Ampfield, SO51 0QA, U.K.
Tél : (44) 1794 368 787
Fax : (44) 1794 368 027.

La Puissance du Monde Végétal

Les personnels du Jardin Botanique d'Edimbourg ont mis en chantier un cours pratique qu'ils ont appelé 'la puissance du monde végétal'. Cet atelier qui a eu lieu les 9 et 10 mai avait pour pour objectif de créer des moyens nouveaux de faire connaître au public l'importance et la diversité de la vie des plantes. Pour plus ample information contacter: RBG Edindurgh, Public Education Departement, 20A Inverleith Row, Edinburgh EH3 5LR U.K.
Tél: (44) 131 248 2866
Fax: (44) 131 248 2901.

Retour au Pays des Plantes Indigènes

Cette année, en mai, une vieille dame toute ridée et sa petite fille accompagnées d'une malle d'objets

● Noticias

Left: Sculptor John Thomson is an artist in residence at the Sir Harold Hillier Gardens and Arboretum

residencias Southern Art que forman parte del Año Nacional del Artista, el cual da inicio en junio del 2000. El programa de residencia planea llevar al arte y los artistas fuera de los lugares tradicionales asociados con el arte, y llevarlos a sitios cotidianos más accesibles para el público.

John residirá en el Arboretun y Jardines Sir Harold Hillier durante un año trabajando en el proyecto 'Salir de adentro y entrar afuera'. Durante su residencia en el jardín, John trabajará dentro de un invernadero de energía solar donde los visitantes lo verán claramente desde el exterior. Gran parte de su trabajo ha sido inspirado del mundo natural, por lo que John piensa que los jardines serán fuente de nueva investigación y producción de trabajos de arte. La obra permanecerá dentro del invernadero, y después la colección, incluyendo al invernadero, se reubicará en una galería de arte para su exhibición a fines del 2001. Para mayores informes contactar a: Mary South, The Sir Harold Hillier Gardens and Arboretum, Jermyns Lane, Ampfield, Romsey Hampshire S051 0QA, U.K. Tel: (44)1794 368787 Fax: (44) 1794 368027.

El Atractivo Poder de las Plantas

El personal del Real Jardín Botánico de Edimburgo ha desarrollado el nuevo curso-taller de interpretación 'El poder de las plantas'. El taller tendrá lugar el 9 y 10 de mayo, y se centrará en el desarrollo de innovaciones para promover entre el público la variedad de plantas y su importancia. El taller

■ News

Arboretum, Jermyns Lane, Ampfield, Romsey Hampshire SO51 0QA, U.K.
Tel: (44) 1794 368787
Fax: (44) 1794 368027.

The Pulling Power of Plants

Staff at the RBG Edinburgh have developed a new workshop course on interpretation called 'The Pulling Power of Plants'. Taking place on 9 & 10 May, the workshop focused on developing innovative ways of promoting the value and variety of plant life to the public. The workshop was targeted towards anybody working with plants and the public. For further information contact: RBG Edinburgh, Public Education Department, 20A Inverleith Row, Edinburgh EH3 5LR U.K. Tel: (44) 131 248 2866 Fax: (44) 248 2901.

Return of the Native

In May this year, a wizened old lady, her granddaughter and a trunk of curious objects visited over 1000 children at fifty primary schools across the Highlands and Islands region of Scotland. Organised jointly by the Flora Celtica Project and the Education Department of the Royal Botanic Garden Edinburgh, this educational roadshow represents one of many events co-ordinated by the RBGE during the year 2000 to celebrate Scotland's rich tradition of native plant use.

The Scots have always been adept at using their native plants, and the Flora Celtica initiative is seeking to document and promote this, ensuring that this aspect of Scottish heritage not only survives, but blossoms in the next Millennium. Increasing people's awareness of the importance of plants is essential if an improved sense of stewardship is to be kindled, and what better way to do this than by identifying the many ways in which plants are important to our culture?

The roadshow, a Millennium Funded Project, together with a travelling exhibition, will tour Scotland for 18 months. The main character of the theatre-based roadshow, Flora Celtica, and her granddaughter lead children

▲ Nouvelles

bizarres ont rendu visite à plus de 1000 enfants de 50 écoles primaires des Highlands et des îles écossaises. Organisée à la fois par l'opération 'Flore Celtique' et le département éducatif du Jardin Botanique d'Edimbourg cette tournée est l'un des nombreux événements organisés par le RGBE pour rappeler la riche tradition de l'usage des plantes indigènes.

Les Ecossais ont toujours été de grands adeptes de l'utilisation des plantes de leur pays et l'initiative 'Flore Celtique' vise à enrichir et à promouvoir un tel état d'esprit afin que cet aspect de l'héritage écossais non seulement survive mais s'épanouisse au cours du prochain millénaire. Augmenter chez les gens la conscience de l'importance des plantes est essentiel si l'on veut améliorer chez eux le sens de leur gestion. Le meilleur moyen de le faire n'est-il pas de les amener à découvrir les nombreux témoignages de l'importance des plantes dans notre culture?

Le spectacle ambulant, opération alimentée par le Fond du Millénaire, ainsi qu'une exposition itinérante parcourra l'Ecosse pendant 18 mois. Le personnage principal de cette tournée théâtrale, Flora Celtica, et sa petite-fille emmènent les enfants en un voyage-découverte dans le monde de l'utilisation des plantes: utilisation comme source de nourriture, teintures et médicaments mais aussi rôle dans le folklore, l'artisanat et la gestion de l'environnement, c'est à dire le contrôle de l'érosion. En imaginant les campagnes publicitaires pour lancer sur le marché des produits végétaux, on présente aux enfants les problèmes concernant les possibilités nutritives des plantes et l'importance de leur conservation. En dernier lieu, par l'intermédiaire d'une série d'activités organisées par les professeurs après le départ de Flora Celtica, le spectacle encourage les enfants à découvrir plus sur l'usage des plantes dans leur propre entourage et stimule le dialogue avec et les générations antérieures.

La seconde production destinée au public, l' exposition sur la flore celtique, débutera au Jardin Botanique Royal

● Noticias

está dirigido a quienes trabajan con plantas y público. Mayor informes en: RBG Edinburgh, Public Education Department, 20a Inverleith Row, Edinburgh EH3 5LR U.K.
Tel: (44) 131 248 22866
Fax: (44)248 2901.

De Regreso a lo Nativo

En mayo de este año una anciana y sabia mujer, su nieta y un montón de curiosos objetos visitaron a más de 1000 niños en 50 escuelas primarias de las Tierras Altas e Islas de Escocia. Organizado conjuntamente por el proyecto Flora Céltica y el Departamento de Educación del Real Jardín Botánico de Edimburgo, este educativo espectáculo rodante es sólo uno de los múltiples eventos coordinados por el RBGE durante el 2000 para celebrar la rica tradición escocesa del uso de plantas nativas.

Los escoceses siempre han sido afectos a utilizar sus plantas nativas y la iniciativa de la Flora Céltica pretende documentar y promover esta herencia de Escocia de modo que no solo subsista sino que florezca en el próximo Milenio. Aumentar la conciencia en la gente sobre la importancia de las plantas es esencial si queremos ganar su colaboración, y qué mejor manera de lograrlo identificando la importancia de las plantas en nuestra cultura.

El espectáculo rodante, un Proyecto del Fondo del Milenio, junto con una exposición itinerante recorrerán Escocia durante 18 meses. El personaje principal del espectáculo teatral Flora Céltica y su nieta, llevan a los niños a un viaje a descubrir el mundo de los usos de las plantas, incluyendo las alimenticias, colorantes, medicinales, folklore, artesanales, así como las que se usan en diversos manejos ambientales por ejemplo para el control de la erosión. Ideando campañas publicitarias para los productos vegetales se introduce a los niños aspectos relacionados con sustentabilidad y la importancia de la conservación. Finalmente, a través de una serie de actividades que organizan los maestros una vez que Flora se ha

■ News

on a voyage of discovery into the world of plant use, including their uses as sources of food, dyes, and medicines, as well as their roles in folklore, crafts and in modern environmental management e.g. in erosion control. Through devising advertising campaigns to market plant products, the children are introduced to issues relating to sustainability, and the importance of conservation. Finally, through a series of activities organised by teachers after Flora has departed, the roadshow encourages the children to find out more about plant use in their own community and stimulate dialogue between them and older generations.

The second public-focused output, the Flora Celtica exhibition, will start at the RBGE in July 2000, before travelling to venues across Scotland. Using information contributed by the public and Scottish businesses, it will reflect the diversity of past and present native plant use in Scotland, and represent an exciting display of plant-based cultural heritage. Using animation, audio recordings and interactive exhibits, the exhibition will focus on case studies of people whose livelihoods, interests and memories are connected to plant use. For further information contact: Flora Celtica Project Tel: (44) 0 131 248 2816 Fax: (44) 131 248 2901. Web: http://www.rbge.org.uk/research/celtica

Conservation and Environment Guidelines

The Royal Horticultural Society (RHS) has produced a series of brochures entitled 'Conservation and Environment Guidelines'. The brochure series targets the general public and is available free to their members. The extensive series addresses topics such as: organic gardening, fertilisers and manure, genetic engineering, energy conservation in greenhouses, recycling, the use of limestone in horticulture, water supplies, peat and the gardener, the use of garden chemicals, CITES, wild and endangered plants in cultivation, potentially harmful garden plants, wild flowers and the garden and wildlife in gardens. Each brochure summarises the RHS's policy on the

▲ Nouvelles

d'Edimbourg en juillet 2000 avant de voyager vers différents endroits en Ecosse. L'utilisation des renseignements apportés par le public et les entreprises écossaises reflétera la diversité des usages présents et passés des plantes indigènes et constiituera une restitution passionnante de notre héritage concernant les plantes. En utilisant l'animation, les enregistrements audio-visuels et l'interactivité, l'exposition mettra l'accent sur l'étude de cas où les moyens d'existence des gens, leurs intérêts et leurs souvenirs sont liés à l'usage des plantes. Pour plus d'information contacter: Flora Celtica Project Tél: (44) 0 131 248 2816 Fax: (44) 0 131 248 2901. Web: http://www.rbge.org.uk/research/celtica

Suggestions Pour la Conservation et l'Environnement

La Société Royale d'Horticulture (RHS) a édité une série de brochures intitulées 'Suggestions pour la conservation et l'environnement'. Ces brochures s'adressent aux non-spécialistes et sont disponibles gratuitement pour tous les membres. Cet ensemble aborde des sujets tels que le jardinage biologique, les engrais, le fumier, les manipulations génétiques, la consevation de l'énergie dans les serres, le recyclage, l'utilisation du calcaire en horticulture, l'approvisionnement en eau, la tourbe dans le jardinage, l'usage des engrais chimiques, la CITES, les plantes sauvages menacées dans les cultures, les plantes de jardin potentiellement dangereuses, la flore et la faune sauvages dans les jardins. Chaque brochure résume la politique de la RHS sur des sujets précis et sur ses actions concernant la sélection des plantes de jardin favorisant la vie sauvage et donne des adresses utiles permettant d'obtenir plus de renseignements.
Pour plus ample information contacter: The Science Department, RHS's Garden, Wisley, Woking Surrey GU23 6QB U.K.

● Noticias

marchado, los niños quedan motivados para investigar más sobre los usos de las plantas en sus comunidades y para estrechar la comunicación entre ellos y las viejas generaciones.

La segunda exposición Flora Céltica dirigida al público en general comenzará en julio del 2000 en el RBGE antes de viajar por Escocia. Utilizando información proporcionada por el público y por empresarios escoceses, la exposición reflejará la diversidad del uso pasado y presente de las plantas nativas de Escocia y despliegan la herencia cultural basada en las plantas. Con animaciones, audio grabaciones y exposiciones interactivas la exposición se centra en estudios de caso de gente cuyas vidas, intereses y recuerdos están conectados con las plantas. Mayores informes: Flora Celtica Project, Tel: (44) 0 131 248 2816 Fax: (44)131 248 2901. Web: http://www.rbge.org.uk/research/celtica

Pautas de Conservación y Ambiente

La Real Sociedad de Horticultura (RHS) ha producido una serie de folletos intitulados 'Pautas de conservación y ambiente'. Esta serie está dirigida al público en general y son gratuitas para sus miembros. La serie trata temas como: jardinería orgánica, uso de

Left: One example of the many excellent guidelines produced by the RHS to help the public in managing their garden in a sustainable way

■ News

specific topics and provides action points on plant selection for gardens. Useful addresses for finding out more information are also included.
For further information contact: The Science Department, RHS's Garden, Wisley, Woking Surrey GU23 6QB U.K.

VIETNAM

Launching Education Before Opening Day!

Before it has even officially opened (scheduled for May/June 2000), Tam Dao Botanic Garden has started its education programme! A range of activities have been launched including a training course on technical extension for people living within the Tam Dao buffer zone. This course enables members of the community to plant medicinal plant species in their gardens. Through networking with the Forestry University of Vietnam, the Pharmacy College and the Biological Faculty of the National University, the botanic garden is becoming a vital resource and field centre for higher education. In addition, TDBG has been working in collaboration with training and education divisions from the districts around Tam Dao National Park to provide environmental education activities for pupils within certain communities. For further information contact: Luu Canh Trung, Tam Dao Botanic Garden – Tam Dao National Park, Ho Son Cummune, Tam Duong District Vinh Phuc Province, Vietnam.

NEW APPOINTMENTS

Congratulations to Nick Wright who has been appointed as Education Officer at The Sir Harold Hillier Gardens and Arboretum. Nick trained in horticulture at Otley College, and after completing a degree in Environmental Science joined the Education Service at The Sir Harold Hillier Gardens and Arboretum on a 12 month student work placement. Following this Nick then gained a 12 month scholarship to the Jerusalem and University Botanical Gardens, before returning to take up the post at The Sir Harold Hillier Gardens and Arboreta. Nick Wright has replaced Mary South.

▲ Nouvelles

VIETNAM

Lancer l'Éducation Avant le Jour d'Ouverture

Avant même son ouverture officielle (prévue en mai-juin 2000), le Jardin Botanique Tam Dao commençait son programme d'éducation! Une série d'activités ont été lancées, dont un stage de formation technique pour les habitants de la zone tampon de Tam Dao. Cette formation permet aux membres de la communauté de planter des espèces médicinales dans leurs jardins. Par l'intermédiaire d'un réseau incluant l'Université Forestière du Vietnam, le Collège de Pharmacie et la Faculté de Biologie de l'Université Nationale, le jardin botanique est devenu une ressource vitale et un centre pour l'éducation de haut niveau. De plus, le TDBG a travaillé en collaboration avec les divisions de l'éducation et de la formation des districts proches du Parc National de Tam Dao pour fournir des activités d'éducation à l'environnement pour les élèves de certaines communautés. Pour plus d'informations, contacter: Luu Canh Trung, Tam Dao Botanic Garden-Tam Dao National Park, Ho Son Cummune, Tam Duong District Vinh Phuc Province, Vietnam.

NOUVEAUX RENDEZ-VOUS

Félicitations à Nick Wright qui a été nommé responsable d'éducation au Jardin et Arboretum Sir Harold Hillier. Nick enseignait l'horticulture au Collège Otley et après avoir passé un diplôme en sciences de l'environnement, il a rejoint le Service Educatif du Jardin et Arboretum Sir Harold Hillier pour un stage de 12 mois. Après cela, Nick a bénéficié d'une bourse de 12 mois au Jardin Botanique de l'Université de Jérusalem avant de revenir prendre ce poste au Jardin Botanique et Arboretum Sir Harold Hillier. Nick Wright a remplacé Mary South.

Mary South, qui était responsable de l'éducation au Jardin Botanique et Arboretum Sir Harold Hillier depuis 9 ans occupe maintenant un nouveau poste au Jardin comme organisatrice

● Noticias

químicos en el jardín, CITES, cultivo de plantas silvestres y amenazadas, plantas de jardín potencialmente nocivas, plantas silvestres en el jardín y vida silvestre en el jardín. Cada folleto resume la política de la RHS ante cada uno de los trópicos tratados así como acciones referente a la selección de plantas para jardines, promoviendo la vida silvestre en los jardines caseros, y direcciones donde encontrar mayor información al respecto. Para más informes contactar a: The Science Department, RHS's Garden, Wisley Woking Surrey GU23 6 QB UK.

VIETNAM

¡Iniciando con educación antes de la inauguración!

Antes de la inauguración oficial (programada para mayo/junio 2000), el Jardín Botánico de Tam Dao ya inició su programa de educación! Se ha iniciado con diversas actividades incluyendo un curso de capacitación de extensión técnica para los habitantes de la zona buffer de Tam Dao. El curso permitirá a la comunidad cultivar plantas medicinales en sus jardines. En colaboración con la Universidad Forestal de Vietnam, el Colegio Farmacéutico y la Facultad de Biología de la Universidad Nacional, el jardín botánico se está convirtiendo en un recurso vital y centro para trabajo de campo para la educación superior. Igualmente ha estado trabajando en colaboración con la división de educación y capacitación de los municipios cercanos al Parque Nacional Tam Dao para desarrollar actividades de educación ambiental para alumnos de ciertas comunidades. Para más información dirigirse a: Luu Canh Trung,Tam Dao Botanic Garden, Tam Dao National Park, Ho Son Cummune, Tam Doung District Vinh Phuc Province, Vietnam.

NUEVOS PUESTOS

Felicitaciones a Nick Wright quien ha sido designado Jefe de Educación del Arboretum y Jardines Sir Harold Hillier. Nick es horticultor de Otley College, y después de un posgrado en Ciencias Ambientales ingresó al Servicio de

■ News

Mary South, who was the Education Officer at The Sir Harold Hillier Gardens and Arboretum for nine years has now taken a new post with the gardens as Events Organiser. During the last nine years Mary focused on establishing the education programme and has implemented a 'no worksheets' policy in the gardens. Mary used her expertise to offer programmes tailor-made to specific class needs, basing these programmes entirely on activities and games. Mary's new role at the gardens will involve organising key events for the general public including Mothers Day events, overseeing evening lectures, musical events, art events and artists in residence. We wish Mary all the best with her new role.

SEMINARS

Research in Teaching and Learning

Chelsea Physic Garden, in association with The National Foundation for Educational Research, will be hosting a one day seminar entitled 'Environmental Teaching and Learning : Recent Research' on Friday November 17 2000 from 10 am - 4.30pm. Sessions during the day will address research methodologies, issues and ways to move forward. The presentations will look at teaching and learning both within the classroom and in gardens. Environmental issues, perceptions of cultural identity and children's ideas about plants will also be covered. Extracts from the seminar will be published on the internet on the Chelsea Physic Garden site (www.cpgarden.demon.co.uk) and a publication will be available in 2001. For further information contact: Dawn Sanders, Chelsea Physic Garden, 66 Royal Hospital Road, London SW3 4HS Tel: (44) 20 7352 5646
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▲ Nouvelles

d'évènements. Pendant ces 9 années, Mary s'est consacrée à l'implantation d'un programme éducatif et d'une politique pas de 'worksheets' dans le jardin. Mary a utilisé son expérience pour offrir des programmes sur mesure pour les besoins spécifiques des classes, basant entièrement ces programmes sur les activités et les jeux. Le nouveau rôle de Mary au Jardin concernera l'organisation d'évènements pour le grand public par exemple les évènements liés à la fête des mères, des lectures du soir, des évènements musicaux, des évènements artistiques pour n'en citer que quelques uns. Nous souhaitons à Mary le succès dans sa nouvelle fonction.

SÉMINAIRES

Enseignement et apprentissage de l'environnement

Le Chelsea Physic Garden, en association avec la Fondation Nationale pour la Recherche en Education, accueillera un séminaire d'une journée intitulé 'Enseignement et apprentissage de l'environnement: Recherches récentes', le vendredi 10 novembre 2000, de 17 à 16H30. Les sessions auront pour thème les méthodologies de recherche, les résultats et les façons d'aller plus loin. Les présentations traiteront des enseignants et des apprenants dans leur classe et dans le jardin. Les aspects environnementaux, les perceptions de l'identité culturelle et les idées des enfants sur les plantes seront également au programme. Des résumés du séminaire seront publiés sur le site internet du Chelsea Physic Garden (www.cpgarden.demon.co.uk) et une publication sera disponible en 2001. Pour plus d'informations, contacter: Dawn Sanders, Chelsea Physic Garden, 66 Royal Hospital Road, London SW3 4HS
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● Noticias

Educación del Arboretum como estudiante durante un año. Posteriormente obtuvo una beca por 12 meses del Jardín Botánico de la Universidad de Jerusalém. Al reintegrarse al Arboretum Nick sustituye a Mary South.

Mary South quien se desempeñó como Jefe de Educación del Arboretum y Jardines Sir Harold Hillier durante 9 años, ahora ha tomado su nuevo cargo como Organizadora de Eventos. El programa de educación establecido por Mary seguía la línea de 'fuera hojas de trabajo' en los jardines. Mary con su experiencia ofrecía programas a la medida según las necesidades de los grupos y basaba sus actividades en actividades y juegos. La nueva función de Mary en los jardines será organizar eventos para el público como para el Día de la Madre, conferencias, concieros y artistas residentes entre otros. Le deseamos lo mejor a Mary en su nuevo puesto.

SEMINARIOS

Investigación en enseñanza y aprendizaje

El Jardín Físico de Chelsea en colaboración con la Fundación Nacional de Investigación Educativa será sede del seminario 'Enseñanza - aprendizaje ambientales: investigaciones recientes', el cual tendrá lugar el 17 de noviembre del 2000 de 10am – 4:30pm. Las sesiones tratarán metodologías, resultados y perspectivas.

Las presentaciones tratarán sobre enseñanza y aprendizaje tanto en el salón de clases como en los jardines. Problemática ambiental, percepción de la identidad cultural e ideas de los niños sobre las plantas también se tratarán. Resumenes del seminario se publicarán en el sitio de internet del Chelsea Physic Garden www.cpgarden.demon.co.uk y habrá una publicación en el 2001. Mayores informes con Dawn Sanders, Chelsea Physic Garden, 66 Royal Hospital Road, London SW3 4HS
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Représenter La Nature : Un Défi Pour Les Éducateurs des Jardins Botaniques

Representando a la Naturaleza: El Desafío Para Los Educadores en Los Jardines Botánicos

Representing Nature:

The Challenge for Botanic Gardens Educators

Summary

Botanic gardens are places where nature is continually being remade and re-presented. As their collections are increasingly capitalised as reserves of biodiversity and framed as educational experiences, it is important that their staff have a critical understanding of the processes at work, their relation to processes in the wider world, and alternatives that offer more sustainable futures. John's keynote examines the social construction of nature within and beyond botanic gardens and argues that Education for Sustainability (EfS) should be informed by advances in theory that allow us to rethink environmentalism, progressive social natures, and radical education. In suggesting EfS guidelines for botanic gardens he draws on such theory and on the experience of projects that have combined community gardening with ecological restoration and the creation of sustainable livelihoods.

Keynote Address

This paper explores ways in which plants can be used to raise development and environmental issues. In so doing it offers some guidelines for how botanic gardens can become centres of excellence in education for sustainability (EfS). The approach is in two parts. The first theoretical part suggests that Ayruvedic philsophy and medicine shares with critical theory and critical EfS (critical approaches to education for sustainability) certain assumptions about the health of the individual and society and links between health, education and sustainability. The second more practical part suggests how critical educators for sustainability might explore development and environmental issues in a botanic garden. Three case studies, each using one of the healing plants of India as a focus, have been chosen to illustrate the issues raised by genetically modified plants, new gardening in Britain, and community gardening around the world. The case studies respectively serve to illustrate the importance of the content and pedagogy of the botanic garden curriculum and the locations where it is delivered.

The theme running through this paper is the social construction and presentation of nature. At a time of profound social change, that encompasses the process of globalisation, nature is being increasingly capitalised (given a price and made the subject of market transactions) and enframed (represented by 'texts' of all kinds as in advertisements, television documentaries, environmental campaigns, and brochures for botanic gardens) (Braun & Castree 1998). The rise of biological and information technologies, together with the increasing significance of the cultural economy (the production and exchange of 'texts'), means that nature and society are increasingly inseparable. Societies that formerly expanded outwards to push back the frontiers of non-commodified nature and create such phenomena as commercial agriculture, now turn inwards to remake these social natures afresh and commodify such new ones as the human body. This process is legitimated and challenged by the various discourses of environmentalism (Dryzek 1997) as new natures are constructed both in reality and in our imaginations. The discourse or language of sustainable development can mask the ways in which nature is constructed in ways that disadvantage the poor, women, and people of colour, and we will see that environments, meanings and educations created in the name of sustainability are often challenged.

Such challenges should extend to botanic gardens. At a time when dominant forms of nature are being constructed and represented in unsustainable ways, can botanic gardens and their educators reconstruct and represent nature in more sustainable ways? For guidance as to how this might be done let us look first to Ayurvedic philosophy and medicine.

Ayurvedic Philosophy and Medicine

Ayurvedic philosophy maintains that people's highest goal is to understand the principle of Brahman, the unity of life, or how we are linked to the rest of human and non-human nature (Patnaik 1993). Such understanding promotes health, or a sound body, mind and soul, because people are not isolated from their own energies nor from the energies in the world that surrounds them. Mental health depends on their ability to live in harmony with their inner nature; spiritual health on their ability to live in harmony with external nature.

Ayurvedic philosophy further maintains that people are the highest form of life and that they should act as stewards, ensuring that the fragile balance of nature and living organisms is not disturbed. They should live sustainably, preventing pollution and the wanton destruction of nature, replacing what they take from nature,

and reconstructing damaged nature. Ayurvedic doctors are the guardians of the knowledge and values that enables society to live in this way. Professional ethics require them to devote themselves to the health and sustainability of society while their training ensures that they have appropriate theoretical knowledge, clarity of reasoning, wide practical experience, and personal skills.

Critical Social Theory and EfS

Like Ayurvedic medicine, critical EfS is based on theory that seeks to heal the separation or alienation of people from the rest of nature. This critical social theory is based on dialectical and systemic materialism and the associated philosophy of critical realism. (Collier 1994; Dickens 1996; Soper 1995). It rejects the modern scientific notion of an objective, knowable nature, outside society, and like the traditional wisdom of India, pictures a total reality that is the product of ecological and social processes. This suggests that nature is the permanent ground of all human activity and environmental change that sets elastic limits on how we live or might try to live.

The critical social theory of the environment that has developed over the last twenty years (Goldblatt 1996) leads to distinctive kinds of environmental politics and education. Environmental politics becomes a struggle over social relations, their impact on ecological relations and on our physical, mental, spiritual and social health. Production and consumption within the capitalist world economy is ecologically unsustainable because it fails to conserve the ecological resources and services on which it depends. At the same time it is socially unsustainable, because it requires social relations based on inequity and domination at all scales from the local to the global. Radical environmental politics seeks to democratise social relations in order that mutually beneficial relations between humans, between humans and other species, and between organisms and their environment, can be sustained. It seeks to change the institutions, beliefs and practices that reproduce unsustainable social relations and to this end engages in action at many sites (the family, community, the economy, the state, botanic gardens).

Like Ayurvedic medicine, critical education for sustainability that draws on critical theories of the environment and education, seeks to enlighten people as to the unity of nature and society and the manner in which changed social relations might promote more sustainable and healthy ways of living (Huckle 1993; Huckle & Sterling 1996; Fien & Tilbury 1998; Plant 1999).

Critical environmental educators should be able to use critical theory of the environment to enlighten and empower their students and critical pedagogy (Gadotti 1996) to clarify reasoning in ways that counter dominant ideology and charges of indoctrination. They should have experience of assisting the transition to sustainability in a wide range of sites and the personal skills to inspire their students with visions of more sustainable futures. Three healing plants are used to illustrate how professionals might currently inform the EfS carried out by botanic garden educators.

Black Pepper, Genetically Modified Plants and Critical Knowledge

Black pepper, long a key item of Indian trade, is used in the mixed spices that form the basis of curry powder and to alleviate colds and coughs. It is just one of the many plants that has been subject to bioprospecting: the process whereby a handful of transnational seed, agrochemical and pharmaceutical companies assert property rights over species with the help of governments and intellectual property regimes. The companies suggest that they will use their newly acquired rights in nature to develop more sustainable forms of agriculture that help to solve the world's food crisis. Their critics reject such property rights, seek a different approach to biotechnology, and argue that the world's food problems are best tackled by forms of sustainable development that improve traditional agriculture through land reform, permaculture, intercropping, composting, cheap credit, and other innovations.

How should botanic garden educators present the debate on biotechnology? How should they encourage people to recognise what Riffkin (1999) has described as the hard and soft paths to a future shaped by this technology (Figure 1)? Clearly the two paths are informed by different views of nature, different kinds of knowledge, and serve different political interests. Vandana Shiva reminds us that in educating for sustainability we have to reveal these interests and persuade people that no technology is inevitable or beyond our control. We also have to facilitate community empowerment in order that they can act.

Left:
John Huckle challenged congress delegates with his Keynote address on education for sustainability

Community resistance to hard applications of biotechnology can be found in the North and South. How should botanic garden educators encourage consumers in the North to network with farmers in the South? How should they tell the stories of farmers, such as those in India, who are caught up in a growing ecological and social crisis, partly caused by green revolutions that failed to deliver what they promised (Vidal 1999b)? How should they counter the public relations and media rhetoric of the biotechnology companies and their supporters in government who regard trade liberalisation and biotechnology as the keys to food security? And having engaged visitors in the politics of biotechnology, bioprospecting and intellectual property rights in nature, should botanic garden educators suggest, that the conservation of biodiversity depends on the conservation of human diversity?

Clearly answers to such questions determine the kinds of knowledge needed to educate for sustainabilty. Giving biotechnology more visibility and consideration in your botanic garden means giving greater attention to new approaches to the natural and social sciences, people's local knowledge of plants, and political struggles for alternative futures. The content of your displays, presentations and lessons, may well be challenged for in some botanic gardens you are likely to upset existing interests.

Right: Figure 1: Two views of biotechnology (based on Riffkin 1999)

Hard path	Soft path
Nature as external to society and to be 'tamed', 'mastered' and 'controlled'.	Nature as a seamless web of symbiotic relationships and mutual dependencies that includes society or human nature.
The world is seen in reductionist terms and scientists regard themselves as grand engineers, continually editing, recombining and reprogramming the genetic components of life to create more compliant, efficient and useful organisms that can be put to the service of humankind.	The world is seen in dialectical and systemic terms with the earth and its living things constituting a single (differentiated) organism – the biosphere. Scientists and others should engage in subtle forms of manipulation that enhance rather than sever existing relationships.
Molecular biologists insert alien genes into the biological code of food crops to make them more resistant to herbicides, pests, bacteria and fungi. They envision these engineered hybrids living in a kind of genetic isolation, walled off from the larger biotic community, and ignore the environmentalists fears of genetic pollution.	Ecologists use the new genomic information to help them understand how environmental factors affect genetic mutations in plants. They use the new scientific knowledge to improve classical sustainable farming methods, such as breeding, pest management, crop rotation.
Uses the new genetic science to engineer changes in the very blueprint of species.	Uses the same genetic science to create more integrative and sustainable relationships between existing species and their environments.
Privately financed, centralised, corporate control. Establishes ecological monocultures and erodes biodiversity and human diversity.	State financed, decentralised, community control. Promotes biodiversity and human diversity.
Promotes academic knowledge over local knowledge.	Values local knowledge.

The Hundred Leaf Rose, The New Gardening and Postmodern Pedagogy

The hundred leaf rose is widely used in India for perfumes, to make a gentle laxative, and to flavour sweet dishes. It provides a bridge to gardening in Britain where roses remain one of the most popular plants. Gardening in Britain is currently big business, with consumers spending £3 billion each year (£80 million on garden gnomes!) and the industry growing at 20% a year (Vidal 1999a). Much of this growth is prompted by a new kind of gardening programme on television, that fosters the cult of the instant garden through which people are encouraged to express themselves and make an aesthetic or lifestyle statement through their gardens. The new gardening is made possible by new technologies in container growing that allow 'just in time' gardens, and seeks to sweep away the mystique of seeds, catalogues and cuttings that surrounded the old gardening programmes. It is presented as entertainment and fantasy by the media with gardens becoming fashion led living spaces. The new gardeners want plants instantly and will dispose of them once the fashion passes. Like the gardens of the past, the instant garden reflects social and cultural trends in contemporary Britain. In disorganised capitalism or what some label postmodernity, the foundations of social structure and agency shift from the sphere of production to that of consumption. Identity and politics are increasingly focused on the goods, services people consume and the images and meanings which surround these commodities.

How should botanic garden educators respond to such changes? Clearly there is a role for cultural theory in informing the content of displays, publications and lessons, but I wish to focus on the shifts in pedagogy or the teaching and learning process. The new gardening suggests that postmodern individuals are rather different from modern individuals, in the ways that Thompson suggests (Figure 2).

The Enlightenment Subject	The Postmodern Subject
• is HOMOGENEOUS – all subjects share the same basic nature	• is HETEROGENEOUS OR FRAGMENTED – patched together out of a variety of different bits of values, identities and beliefs
• is UNIFIED – individual subjects do not possess internal contradictions	• is DISPERSED OR DECENTRED – characterised by all sorts of internal divisions, such as that between consciousness and unconsciousness
• is RATIONAL – characterised by the power of conscious reason	• is SOMATIC - inseparable from the body and its needs and desires
• is AUTONOMOUS – able to exercise its reason in order to be self-governing	• is CREATIVE – while lacking the modernist power of autonomy, it may be inventive in ways unknown to the modernist subject
• is STABLE IN IDENTITY – unchanging over time	• is UNSTABLE – changing over time
• is an INDIVIDUAL – possessing unique qualities and abilities (although not different basic natures) that mark it out as distinct from all others.	• Although not a self-contained individual, the patchwork of which it is composed may mean it is at least IDIOSYNCRATIC.
A sovereign individual, with a solid and stable core, possessing powers of rational autonomy.	A complex combination of relatively random components.

Left:
Figure 2:
The modern and postmodern subjects compared (Thompson 1998, p148)

Disorganised capitalism encourages and requires more fragmented, decentred, somatic and reflexive individuals, who are able to assess and criticise their own values and behaviour and alter them if necessary. The unified knowable self has ceased to exist and teachers should therefore learn to work with people's diverse identities, desires, and pleasures, engaging them in dialogue and activity that draws on their grounded cognitive and aesthetic understandings of plants and nature. Such activity is likely to contain significant elements of media and consumer education and will convey a questioning and reflexive attitude, enabling students to perceive the structures of power that shape their subjectivities (Castells et al 1999). It will accommodate diverse voices, from peoples and species variously located within ecological and social relations, and so develop the kind of communicative rationality that fosters ecological democracy and sustainability. Botanic garden educators can glimpse elements of such pedagogy in the work of Body Shop, AdBusters, Greenpeace, and such new attractions as the Earth Centre in Doncaster, U.K.

Indian Hemp, Community Gardening, Wide Experience and Practical Skills

Indian hemp or cannabis has religious, recreational and medicinal uses in India. It provides a bridge to Exodus, a community living in Luton, thirty miles north of London, and to other community gardeners around the world. The largely unemployed and homeless members of Exodus squatted derelict buildings and land in Luton, establishing a housing action zone (HAZ Manor) and a city farm by 'do it ourselves' methods. At HAZ manor they have a communal organic garden, a sustainable water system, and are saving for a renewable energy system. They have gradually found an accommodation with the police and Luton Council and have plans for The Ark, a community centre for others who are socially excluded on Luton's Marsh Farm estate. It will have a non-profit community shop, provided with organic fresh vegetables by the farm, a wind generator making energy for the whole estate, and cheap entertainment of all sorts for young people.

The sort of initiative that Exodus has taken in establishing a community garden is found all around the world. Stocker and Barnett (1998) remind us that community managed gardens of various kinds can act as change agents for sustainability by: producing fresh, safe organic food (physical and ecological sustainability); creating community places for social and cultural interaction, encounter, negotiation, and embodied engagement with the land, other community members, and the wider society (sociocultural sustainability); and providing sites of research, development, design, demonstration and dissemination for community science, horticultural techniques, and innovative technologies (economic sustainability). They can fulfil important functions in the Local Agenda 21 process by acting as living examples of the praxis of sustainability and thereby establishing participatory democracies that permeate people's bodies and communities and act as a political signpost to local government and the wider society.

Botanic garden educators should be involved in community gardening. They should encourage their colleagues to share their expertise with community gardeners and open botanic gardens to the community. I realise that there has been much innovation and progress in this direction, but the community garden is the key site at which botanic garden educators can bring sustainability alive to ordinary people. We should remind ourselves also that pathways to sustainability are only partly local. Community gardens and other initiatives for change from below can only grow if there is change from above.

Towards Sustainability

In his book *Nature's Keepers*, Stephen Budiansky (1995) recounts the experience of William Jordan at the University of Wisconsin Arboretum. He found that a conventional environmentalism, based on modern ecology, that asks people to love and revere nature but never touch her, brought excessive use of the arboretum by passive consumers of nature. When he began to promote a radical environmentalism, based on postmodern ecology that asks people to reconstruct nature so that it better meets their interests and those of other species, a huge number volunteered for restoration projects in the Chicago area.

My challenge to you therefore, as botanic garden educators, is to consider the role you may play in the social construction of unsustainable natures and to engage with colleagues and communities seeking to reconstruct nature in more sustainable forms.

This is an edited version of the key note speech John Huckle gave at the BGCI education congress in Thiruvananthapuram, India, in November 1999.

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▲ Resumé

Les jardins botaniques sont des lieux où la nature est continuellement remodelée et aménagée. A l'heure où leurs collections ont de plus en plus capitalisé pour être des réserves de biodiversité et sont conçues comme des expériences éducatives, il est important que leur personnel ait une vision critique des méthodes de travail, de leurs rapport avec les méthodes appliquées dans le monde et des alternatives offertes pour un futur plus durable. Les remarques de John examinent la construction sociale de l'idée de nature dans et hors des jardins botaniques et postule que l'Education au Développement Durable (EfS) doit prendre sa source dans la théorie qui nous permet de repenser l'environnementalisme, la nature devenue plus sociale et une éducation radicale. En proposant un guide d'EfS pour les jardins botaniques, il s'appuie sur une telle théorie et sur l'expérience de projets qui ont impliqué la communauté des jardiniers dans une gestion écologique et la création d'un gagne-pain 'soutenable'.

● Resumen

Los jardines botánicos son lugares donde continuamente se hace y re hace la naturaleza. A la vez que a sus colecciones se les representa como reservas de biodiversidad y se enmarcan como experiencias educacionales, es importante que su personal tenga un conocimiento crítico de los procesos que se trabajan, su relación a los procesos del mundo en general, y de las alternativas que ofrecen un futuro mas sostenible. La ponencia de John examina la construcción social de la naturaleza dentro y mas allá de los jardines botánicos y argumenta que la Educación para la Sostenibilidad (EpS) debe ser formada por avances en una teoría que nos permita redefinir el ecologismo, el progreso de la naturaleza social, y la educación radical. Sugiere modelos de conducta de este tipo para los jardines botanicos refiriendose a tales teorías y a la experiencia extraída de proyectos que han combinado la jardinería en la comunidad con la restauración y la creación de formas de vida sistenibles.

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Former Les Enseignants: Développer des Compétences à Travers l'Éducation à l'Environnement
Construyendo Una Capacidad de Enseñanza en el Profesorado
el Desarrollo de Abilidades Através de la Educación Medio Ambiental

Teacher Capacity Building:

Skills Development Through Environmental Education

Summary

The Pretoria and Witwatersrand National Botanical Gardens, with funding from UNESCO, are embarking on a two year teacher development programme to provide professional development for 210 teachers from the under resourced and historically disadvantaged schools in Gauteng Province, South Africa.

Teachers have been invited to participate in workshops that link social, political and economic processes to natural systems; and contribute towards building a culture of environmental awareness, knowledge and action. The training focuses on an issues based teaching approach that attempts to deal with issues relevant to the learners daily lives and encourages teachers to look beyond the confines of the classroom for teaching and learning resources and experiences. During the workshops, teachers from Banareng Primary School identified learners who were unable to concentrate in class because they were hungry. The environmental issues linked to this social issue, included the lack of a vegetable garden, limited water and funds and community indifference and inactivity. The workshops began to help the Banareng teachers break down this issue into manageable parts and now the school has started a vegetable garden which provides 520 children with a cooked midday meal. The children are now in a better position to learn and their concentration and academic progress have improved.

Background

In its new education policy introduced in 1997, South Africa has adopted an outcomes based education approach. *'This is directly linked to democratisation and the resulting effort to address the political injustices of South Africa's past through the transformation of the national system of education and training'* (Department of Environment Affairs and Tourism 1998). Environmental understanding and skills are, for the first time, prescribed as key outcomes in all eight learning areas of the South African school curriculum.

South Africa's most recent Government White Paper on Education and Training states that environmental education, *'…involving an interdisciplinary, integrated and active approach to learning, must be a vital element of all levels and programmes of the education and training system, in order to create environmentally literate and active citizens to ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources'* (Department of Education 1995).

In addition to the above, teacher education has been described by UNESCO as '…the priority of priorities…' in environmental education (UNESCO 1990). Despite the emphasis on environmental education, many provincial education departments do not have the expertise or funds to run development programmes to support teachers with environmental education.

The National Botanical Institute (NBI) is one of many parastatal and non-governmental organisations with an interest in environmental education to provide resources for teachers and learners. *Our Teacher Capacity Building: Skills Development through Environmental Education Workshops* are one such initiative. This is a two-year project administered and facilitated by the NBI and funded by the South African National Commission for UNESCO.

Scope of the Project

The project caters for teachers (210 primary and high school) over a two-year period. The schools participating in the first year were selected with the assistance of the provincial education department and came mostly from under-resourced schools in township areas close to the NBI's Pretoria and Witwatersrand National Botanical Gardens. Teachers selected to join the project were requested to sign an agreement committing themselves to three workshops, a weekend field trip and a number of tasks and assignments. The principal of each school was asked to sign the same document as a pledge of support.

Aims and Objectives

The aims and expected outcomes of the project were identified jointly by the teachers, the education department officials and the NBI staff at the first workshop. These were to:

- encourage and support the development of environmental education at schools
- demonstrate the practical links between outcomes-based education and environmental education
- introduce a process enabling teachers to identify and analyse local/school/community environmental issues and to develop learning programmes around these issues
- provide the opportunity to implement activities that promote active learning.

Right: Alexis Symonds spoke about important outreach programmes undertaken by the National Botanical Institute in Pretoria, South Africa

An Issues-Based Approach

In our workshops we tried to move away from the traditionally held view that environmental education refers purely to the physical environment, to a view that links social, political and economic processes to natural systems. We initiated an issues-based approach in an attempt to deal with issues identified as important in the daily lives of the learners and also to encourage teachers to look beyond the confines of the classroom for teaching and learning resources and experiences.

Examples of some of the issues identified in the schools:

- poor state of school yard and garden
- poverty
- dumping and littering
- inability to establish a vegetable garden
- vandalism
- drug abuse
- unhealthy sanitation at school
- water wastage.

Workshopping the Issues

After the teachers had identified and submitted their issues, resource materials were collected from as many sources as possible. For issues such as vandalism and drug abuse, where we lacked expertise, we entered into partnerships with organisations or individuals that provided relevant literature and facilitated small working group sessions with the teachers. The teachers had the opportunity to discuss and workshop their issues and were introduced to many different types of resources. A list of addresses and service providers that produce inexpensive resource material suitable for future use in the classroom was drawn up.

Lesson Plans and Activities

The lesson planning phase was complicated by the fact that only a small number of teachers attending the workshops had received prior training in outcomes-based education. To build teacher confidence, we embarked on a step-by-step approach to lesson planning in the outcomes-based way, using the issues identified as the unifying theme.

At least 50% of the teachers successfully developed and trialled lessons based on their issues. Most of them reported that their lessons had been successful while some came back for advice on aspects such as assessment and the facilitation of group work.

In a number of schools, the teachers and learners initiated long-term actions or projects that have not only improved the quality of life of the learners at the school but have also impacted positively on the community surrounding the school.

Phatudi Primary School, for example, was concerned about the unhygienic conditions created by poor sanitation at the school. In Maths the learners determined the ratio of toilets to users and the cost of maintenance of blocked toilets. In Life Skills they looked at personal hygiene and contagious diseases. In Language classes they wrote letters to the education authorities using the data collected to motivate for renovations to the toilet block. In Art they made posters to create an awareness of health issues. The school has raised funds and obtained the necessary support from the education authorities to have the toilet blocks extended and renovated while the learners monitor the state of hygiene and cleanliness.

Limiting Factors

1. Outcomes-based Education Training

We understood from the outset that although our focus was environmental education, the vehicle would of necessity be outcomes-based education. However, we did not anticipate that teachers would have had no previous experience or training in outcomes-based education. The result was that we spent a great deal of time introducing teachers to outcomes-based education before we could embark on our core business.

We intend overcoming this problem in the new year by targeting only Grade 7 teachers as they would all have undergone training in outcomes-based education. We believe that in this way we will have more time to focus on environmental issues and the development of learning programmes around them.

2. Drop Out Rate

Although we were disappointed at losing half our teachers along the way, we have learnt that other organisations have had the same experience. This situation was exacerbated by difficulties experienced with public transport in certain areas.

Disagreements between minibus taxi operators resulted in violence in some areas and made the use of public transport to and from workshops unsafe. The threat of country-wide teacher strikes created uncertainty and resulted in workshops being repeatedly postponed.

BANARENG PRIMARY SCHOOL - A CASE STUDY

Banareng Primary School serves the informal settlement in the Attridgeville township about 30 km from the Pretoria National Botanical Garden. At the start of the workshop series, Banareng identified the lack of a vegetable garden at their school as their environmental problem. They pointed out that the chief causes were a lack of water and funds coupled with community indifference and inactivity. Their learners were hungry and unable to concentrate sufficiently to benefit from the education offered.

The first workshop introduced Banareng to an approach which enabled them to analyse their issue, break it down into manageable parts and start looking for solutions to the problems. The Food Gardens Foundation was approached for assistance and training and a committee of teachers, learners, community organisations and parents was formed. The principal of the school, Paulina Sithole, was so inspired by the training received from the Food Gardens Foundation that she was able to motivate her staff, the learners and their parents to start a vegetable garden. The garden now provides 520 children with a midday meal, prepared, cooked and served by women from the community.

As the principal, Mrs Sithole, says proudly: 'We are feeding the child that is hungry, the community that is hungry and thereby feeding the nation. The nation shall never be hungry again, we empower people by teaching them sustainable food gardening to overcome malnutrition and hunger.'

The learners benefit directly from the project in that an attempt is being made to address the negative effects of malnutrition on their concentration and academic progress. It is also anticipated that absenteeism will be reduced as learners begin to feel the effect of a healthier diet.

The project has brought a number of additional benefits to the school and strengthened the relationship between the school and the community in the following ways:

- Establishing a committee consisting of teachers, learners, parents, community members and organisations to oversee the project has fostered a sense of ownership and involvement.
- Neighbours deposit all garden and organic waste in designated areas in the school yard and compost is made from it.
- Glass, cans and plastic are deposited at the school for recycling and the proceeds used by the school.
- Each household contributes their grey water which the children carry to school in two litre bottles each day. This initiative has significantly reduced the water bill at the school.
- Surplus plants and vegetables are sold to the community.
- Banareng has won a number of awards and garden competitions during the year. This has provided them with additional funding for their school.
- Competing at a regional and national level has generated much interest in the project which has resulted in additional sponsorships.
- The school has also been identified as a training venue for other schools and courses are sponsored by various organisations.
- Vandalism and burglaries at the school are less frequent as the community members are quick to report suspicious behaviour to the police.
- The school is able to employ regular gardeners from the community with the income that is generated.
- Environmental awareness and action have been initiated in the community.

As part of the NBI/UNESCO workshop process, the teachers have developed integrated natural science and mathematics lessons using the garden as a teaching and learning resource. Further collaboration between NBI education staff and the teachers is planned to extend the scope of the existing activities and to facilitate activities covering other learning areas.

In Conclusion

In South Africa, the integration of environment into all learning areas in the formal school curriculum provides a unique opportunity for environmental practitioners and teachers to form partnerships that explore environmental education within the context of human influences.

During our workshops the above process was facilitated by adopting an issues-based approach. This provided the opportunity to examine political structures, culture and social equality as well as natural processes and systems in an integrated, practical and useful way.

In addition to the above, the workshop process created the opportunity for capacity building, empowerment and participation, which are important stepping stones in helping to reorientate teachers towards a sustainable and just view of the environment.

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▲ Resumé

Les Jardins Botaniques Nationaux de Pretoria et Witwatersrand, avec le soutien de l'UNESCO, sont impliqués dans un programme de développement sur deux ans pour dispenser une formation professionnelle à 210 enseignants provenant d'écoles sans moyens et historiquement défavorisées de la Province de Gauteng, en Afrique du Sud.

Les enseignants ont été invités à participer à des ateliers qui mettent en relation des aspects sociaux, politiques et économiques avec l'environnement naturel et qui permettent de construire une culture de l'environnement, faite de prise de conscience, de connaissances et d'action. La formation se centre sur un objectif basé sur la réalité des enseignants qui essaient de composer avec les réalités de la vie quotidienne des élèves. Elle encourage les enseignants à regarder au delà des quatre murs de la classe pour acquérir et diffuser des ressources et des expériences.

Pendant les ateliers, les enseignants de l'école primaire de Banareng ont identifié que le fait d'avoir des élèves affamés incapables de se concentrer en classe était un problème social. En conséquence, le projet environnemental constate la pénurie de jardins potagers, les ressources en eau et en argent limitées et l'indifférence et l'inactivité de la communauté. Les ateliers commencent à aider les enseignants de Banareng en transformant toutes ces idées en éléments concrets et actuellement, l'école a mis en place un jardin potager qui fournit le repas de midi à 520 enfants. Les enfants sont maintenant en meilleures conditions pour apprendre. Leur concentration et leurs progrès scolaires sont en hausse.

● Resumen

Los Jardines Botánicos Nacionales de Pretoria y Witwatersrand, con financiación de la UNESCO, estan iniciando un programa de dos años de desarrollo profesional del profesorado para 210 profesores procedentes de los colegios desaventajados y de pocos recursos de la provincia de Gauteng, en Africa del Sur.

Los profesores han sido invitados a participar en talleres que relacionan los procesos sociales, políticos y económicos a los sistemas naturales; y contribuyen a construir una cultura de sensibilidad, conocimiento y acción medio ambiental. Los cursos se dirigen hacia el desarrollo de temas con relevancia a las vidas cotidianas de los estudiantes y animan a los profesores a mirar mas allá de los confines de las aulas para encontrar recursos y experiencias para la ensañanza.

Durante los talleres, los profesores del colegio primario de Banareng identificaron como tema social a aquellos estudiantes con entusiasmo para aprender pero incapaz de concentrarse en clase. Relacionado a esto los temas medio ambientales incluían la falta de un jardín de hortalizas, escaces de agua y fondos económicos e indiferencia e inactividad en la comunidad. Los talleres comenzaron a ayudar a los profesores de Banareng a dividir el tema en partes manejables y el colegio ya tiene un jardín de hortalizas que provee a 520 niños con una comida cocinada diaria. Los niños ahora se encuentran en mejor posición para aprender y su concentración y progreso académico han mejorado.

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L'École Dans la Forêts - Education des Jeunes à la Réserve Botanique de Gurukula

Aula en el Bosque – Educando a Los Jovenes en el Santuario Botánico de Gurukula

School in the Forest –

Educating the Young at the Gurukula Botanical Sanctuary

Summary

The Gurukula Botanical Sanctuary (GBS) is a small remote botanic garden in the humid tropical forests of Kerala, India, that is devoted to conservation and education. Mostly working with native species, low technology methods and local people; the emphasis is on generating and sustaining a way of living that is sensitive to the natural world. Visitors, largely of the region, number a couple of thousand each year. GBS, with its colourful plant and animal inhabitants, is an excellent resource to educate children and adults alike about their region's biodiversity and the urgent need for conservation. Through study, play and participation, as well as activities that involve the various senses, it is hoped that young people can develop a deeper interest and concern for the forest and its community of creatures. Thus, conservation is not an abstract idea in this situation where it is possible to experience and enjoy the connectedness between different organisms and the environment as a daily living reality.

Attracting People with Many Interests

Every year around 2000 people walk up the 3 km of dirt road, in rain and sun, to visit the gardens at the Sanctuary. Around 80% of these are local and regional folks namely families on an outing, schools, youth groups, nature clubs, botany students, seminarians, tribes people, farmers, women's groups and so on. All are given a tour by one of the Sanctuary staff or residents. They are taken around the main garden areas which host an attractive and comprehensive collection of native and exotic plants, arranged in taxonomic order and also landscaped under the natural forest canopy. For these casual visitors it is a chance to satisfy their curiosity and see something quite different. It is also an occasion to learn a little about plants, the importance of conservation and regional efforts to maintain and protect biodiversity. Most are quite surprised and delighted, and many fall under the spell of a colourful and bounteous tropical world, full of unusual and fascinating beings. Often these casual passers-by return with other friends, colleagues or associates for a more detailed and slow exploration of the tropical microcosm that is the Sanctuary.

There are the individuals and groups that come out of more specific concerns or interests. They want to learn horticultural techniques, study the botany and taxonomy of the various groups of plants, see ecology in action, do bird watching, explore possibilities in restoration, conservation, and integrated land use. Some of them come several times over the years and become friends. They are from all over the south; scientists, environmentalists, educators and students. They bring with them wisdom, knowledge, techniques and insights and their visits are a chance for us to explore issues of common concern with a very wide network of individuals.

Workshops Focusing on Conservation and Sustainability

Yet another category of day visitors come as part of a workshop, where a range of activities, tours and discussions are woven around the central theme of conservation and sustainable living. We provide tea and biscuits, they bring a picnic lunch and there is a lot of intense exchange. There are increasing numbers of organic farmers and groups working with farmers who visit us as farming and self sufficiency are among the primary concerns at the Sanctuary. We try to farm the 'natural systems' way where the forest is the model and our lessons from forest ecology and plant biology are applied to food crops. The goal is to maximise diversity and productivity using successional and seasonal dynamics. Such workshops are very practical and involve detailed discussions on farming, agro-ecology, plant diseases and the economics of it all.

There are workshop type engagements with large school groups as well. A number of NGOs are working regionally with environmental science for school kids. We collaborate with them and use the land, plants and animals to demonstrate and explore questions in ecology with the very young.

Most of these children would have grown up in a similar landscape and have intuitive and experiential knowledge of different crop plants, soils, wildlife and the climate. However, for a large number it is still a first time contact with the primary ecosystem of the place. Our local kids are very comfortable with the outdoor environment and yet their eyes are conditioned to lemon grass hills, tea plantations, and increasingly few traditional home farms. Their familiarity with local regional environmental issues brings a kind of schizophrenic element; they know very well the problems of soil erosion and water loss, the dangers of chemical intensive farming, the heating up of the environment, and on the other hand they are vulnerable to the burgeoning mindset that values the

so called benefits of modern development and cash economies, which are intolerant of native cultures and ecosystems. To these children the forest looks messy, wild and dense, and full of dangerous animals like leeches and elephants! (something you could nicely replace with orderly tea slopes and areca nut plantations).

Thus a great deal of time, during local schools' visits, is spent in looking at and discussing the forest world and exploring the feelings and impressions it arouses in their minds. And this is done through a playful exploration of plants, an excited and eager rediscovery of their native landscape and wild community. Common themes that come up include: beauty, gardening with nature, uses of plants, and the role of wildlife.

Working in Partnership with Neighbours

The Sanctuary's intertwined relationship with the neighbourhood allows for an exchange or flow at many levels constantly (labour, services and support). Virtually all the older people in the neighbourhood have at some point or the other worked at the Sanctuary over the last twenty years and this makes the work very locally rooted. Most significantly, the main garden staff for over ten years have been directed and trained by two remarkable young women who have themselves grown into inspired conservationists and highly competent gardeners. They are from the very immediate locality and are part of the core team that shares responsibility for the place. In addition we hold annual festivities which involve the whole neighbourhood. These ritually honour the forest, the earth and the elements followed by a feast for all which is a kind of a remembrance and thank you to powers and forces that have sustained the human community.

Residential Programmes with Regional Schools

I will now focus upon our residential programmes with regional schools, significantly one or two schools with whom we have jointly developed the whole concept of 'School in the Forest'. This term is in part derived from the title 'Gurukula' and is very much the original inspiration under which the place was founded, as a forest retreat and a place of learning.

In ancient India students went to live in the homes of their teachers which were usually in remote quiet places, perhaps in the woods. In this quiet and conducive natural setting, significant disciplines were explored through the act of living and learning together. In our case the Gurukula, or the 'house of the Teacher', includes the forest, the garden with its colourful assemblage of plants and animals, the river, the monsoon climate and also the community of humans in which children and adults can live, participate and share responsibilities for varying lengths of time. Thus, community life at the Sanctuary involves the daily care of other living beings and a consistent and playful enquiry about the wild natural community of which people are a part. Children have come to the Sanctuary and made the place their home and a very critical aspect of all this is that they learn to listen and look and take great interest in the various creatures they share their daily space with.

The main intent of 'The School in the Forest' programmes is to provide a diverse and challenging exposure to a way of life that is intimate with nature and natural processes. The stay at the Sanctuary involves a number of different and complementary aspects. Attention is given to the quality of the whole day, from dawn to dusk, rhythms of other living beings, chores and jobs around the garden and kitchen, quiet contemplative moments, health and physical activity (swimming, tree climbing, outdoor forest games etc), investigation and discussion. Usually, children join in with little or no resistance, especially on their second or third visits by which time they have overcome their initial inhibitions with nature and also established a rapport with the residents and the place itself.

One reason why we have welcomed these residential programmes is that working, functioning and living in nature demand an alertness of the senses and the ability to look continually and afresh at what is going on around one. We feel it is of critical importance for youngsters to develop a different relationship with the natural world and this process requires time. Nature moves in unpredictable ways, never static, always new, revealing deeper patterns and principles. To engage fully with this invites looking and listening, an agile body and a quiet, non-judgemental and yet intensely alert mind. This takes time to develop and most kids, whatever their background, come upon this slowly if given time, some playful guidance and space. All of this is of value, wherever one is; in manual work, play, academic study, human relationship or travel. Our thesis is this; that the loss of such qualities is part of the severance of the connection between humanity and wild nature.

Creating a Space for Learning and Discovery

We have been wondering if it is possible to draw out young people's inherent sensitivity and readiness to look and learn through observation of, and participation in, nature. Awakening the most primary mode of learning (i.e. direct experience and first hand awareness) is too often ignored in education, especially as the child grows older. Contact with the primary gets progressively shaded out as abstract learning takes over, too early in our opinion and often with detrimental results. This may be one factor leading to disconnected, disoriented uprooted youngsters with no sympathy for their immediate environment or for things and people. We thus attempt to create a space for learning that allows for the discovery of something new and afresh, of spontaneous perception, engagement and enquiry as can indeed happen when immersed in nature and natural processes, even for short periods of time. We don't begin by giving them lots of knowledge and information, rather we take them out first and then let perception and understanding blossom into compassion, action and applicable knowledge.

This 'back to nature' form of learning has a second component that is of great relevance too. Making sense of the world around, communication, raising questions and articulating one's observations and concerns are all critical aspects of learning. Seeing connections and reflecting upon them,

expanding the capacity of the brain by allowing its very different intelligences to flower all help to generate a connection to the earth. There are so many fascinating dimensions to explore with the children as their own windows open: heightened awareness, body-kinaesthetic abilities, interpersonal skills, linguistic and intellectual abilities, as well as aesthetic and artistic sensibilities.

If direct experience is woven together with sharing and reflecting and enquiry it brings about good science. This is really to do with being very close to your subject (be it the river habitat, or the bird community, or the plant), so close that you suspend your own judgement and watch, free of pre-conceived ideas the subject until it tells you its story. This becomes extraordinarily intimate, if given time and space, and this intimacy with creation in its vaster aspects or its more minute details has the possibility to bring about a truer and more active compassion.

If you add to this the incentive that children feel when they are active participants in research, (they are assisting and enabling the work of the Sanctuary to continue by bringing in their observations and questions), then the zest for nature study doubles. They are not to be underestimated in their acuity of perception or in their abilities. So, if you want to undertake a study of ants or birds for example, just invite a whole bunch of kids to help you widen and deepen the pool of knowledge of local natural history. The kids become your extended eyes and ears, assistants and junior scientists in a joint exploration and discovery of the natural world.

Thus, the understanding of nature needs a direct involvement, in whatever way, and it can happen in city parks, with a home garden, or trips out to the wilderness. But what is essential is the building up of care, involvement, curiosity, activity and responsibility over time, which begins with a slow tuning in to the cycles and rhythms of the natural world.

Does observation really bring about learning? People differ in their opinions about this, especially about the usefulness of such learning and especially in a world that is dominated by the intellect and where individuals, even in rural areas, are subject to bits of information that trickle down to them third hand and bear no relevance to their immediate world. We believe we have not even touched upon the potential of direct observation, which we suspect is vast, especially for the very young. The trend is to fill them up with colourful books and hi-tech films on nature very quickly and the electronic, virtual or printed media becomes the only gateway to the vital, dynamic, rich and beautiful world. Rather, can the young mind be awakened to the muse of the forest, the incredible complexity of tropical life, the fragility of this ancient ecosystem and the fact that there is no separation between humans and nature? And, once initiated can this connection be sustained?

By observation so far I have been including the action and involvement of all the senses. The senses are a fundamental component to our earth bound existence and to us as physical beings. It is through the senses that we relate to the world at large. Looking, listening, touching, tasting, smelling by bringing these together through games, activities, explorations it opens the doorway into a different and more integrated mode of functioning. This seems to give children a degree of self confidence, self awareness and also a boost to their natural liveliness and spontaneity.

Our main focus has always been on the local outreach programmes and so our residential programmes grew quite organically - slowly, bit by bit, over time. We never had the idea that it could build into anything significant as most schools are ready to send their kids away on trips for a few days at the most, and at best so far as we have seen this turn out to be an enjoyable experience.

Taking the Initiative

Because a few of the teachers were very struck by the beauty of the forest and the possibility that children could develop a more caring relationship with the environment, one school took the initiative in 1993 to send 10 students to the sanctuary for three weeks. The 13 year old students came along with books, teachers and homework, so that they wouldn't miss out on their regular curriculum and we essentially provided a kind of a physical support structure and took them on walks and gave small garden projects to the interested ones. At first we had to deal with quite a lot of reluctance and fear; the leeches, the immersion in wildness, the lack of physical conveniences (we have no electricity or television) and the sheer overpowering effect of it all. Still it went reasonably well, so they came again the next year.

This time all their old inhibitions were gone and they were much more active around the place. They started taking responsibility, becoming easily involved in kitchen and garden chores. The third time round, we decided to run a pilot project with them. This focussed on sense-based learning and the students took to it well. Each had a specific topic they wished to study: one chap followed a colony of red ants, another looked at purple sunbirds, a third looked at one tree and all the animals and birds that came around to the tree, a fourth compared different spots in the river and a fifth investigated rhythms of activity in the main garden area, and so on. They were out looking and watching for several hours a day. From the programme some lovely documents were developed: log books, stories, caricatures, tables, and illustrations.

Below: Suprabha Seshan enthused delegates with her presentation on the work of the Gurukula Botanical Sanctuary

These were very different representations of natural phenomena, but all valid and rooted in the perceived and perceptual field.

This was so exciting that the school sent its 11 years olds the following year for a one month stay and we studied the bird life of the Sanctuary. The same process ensued. On another visit fifteen year olds came and looked at ants. We took their work into the entomology laboratory of Centre for Ecological Sciences in Bangalore and were told that this was excellent science and that all observations were valid and relevant. The only thing we had to ensure was that we didn't mix up species, which is quite difficult to do with ants! This led to further projects on insects in general: the different orders, their peculiar life habits and cycles, habitats, movements and so on.

Finally the oldest students at the school were sent for a three month immersion in simple living. They built their own thatch hut, managed and took care of a piece of land, did lots of natural history observations and some craft work (as they made their own mats and tools and ladles). Into this physical land-based natural context, were woven daily lessons in ecology, globalisation, environmental and personal health, questions in careers and sustainable livelihood, the relationship between self and society, energy issues and farming.

The Commitment Spreads

Lest you assume that all this is happening with only one school, I'd like to add that although it took one school to develop the whole programme of nature education to such a comprehensive and sustained depth, the relevance of it has been picked up by other schools who are now ready to send their children on similar programmes. In the last year, four other schools so far have participated in our residential 'School in the Forest' programmes. This year a school for children with disabilities has asked to come, as well as an NGO working with village youth and a rural school. Being small we can handle only certain numbers. In addition as the programmes are so intensive they can only really be conducted with a maximum of 10-15 kids at a time.

However, it is very encouraging that increasingly, schools in south India are seeing the relevance of this kind of learning, particularly as they are able to use it back home in different ways; especially schools that are really serious about the environmental crisis. The relevance they see is that in such a learning situation conservation is not an abstract idea, but rather a daily living reality through the care and interaction with other life forms and that this brings about a dynamic involvement with the environment.

Working with all these different individuals and groups (local, regional, young, old, on day visits or longer stays) through all these years has brought about an enthusiastic and creative spirit of learning, care and common ownership of the Sanctuary. Children turn up on holidays with parents and friends in tow and introduce them to environmental issues. There is a slow but definite multiplier effect. Young gardeners and budding ecologists, teachers, farmers and travellers, not only take away with them this sense of a marvellous, beautiful and vital world needing care and responsible participation from its human members, but they also bring with them a joy and enthusiasm that nourishes the place itself. In a world that is otherwise directed by the intellect and subject to unnatural and unsustainable pressures of being, there are few opportunities to explore a more basic and spontaneous mode of living. This tragically and inexorably leads to separation from other people, the environment, society and even oneself. It is this fragmentation and separation that we seek to address through the work with nature and young people at the Gurukula Botanical Sanctuary.

▲ Resumé

La Réserve Botanique de Gurukula (GBS) est un petit jardin botanique isolé dans la forêt tropicale humide du Kerala, en Inde, dont la mission est la conservation et l'éducation. Elle travaille principalement avec des espèces locales, des moyens techniques simples et les populations locales. Son objectif est de générer et de soutenir un mode de vie sensible à l'environnement naturel. Environ 2000 visiteurs sont accueillis chaque année, surtout originaires de la région. Le GBS, avec sa flore colorée et ses hôtes animaux, est une excellente ressource pour l'éducation des enfants et mais aussi des adultes sur la biodiversité de leur région et la nécessité urgente de la conserver. A travers des études, des jeux et des animations, aussi bien que des activités mettant en jeu les 5 sens, on espère que le jeune public développe un plus grand intérêt et se sente concerné par la forêt et ses habitants. Ainsi, la conservation n'est pas une idée abstraite dans la mesure où il est possible de vivre et de ressentir les rapports entre les différents organismes et leur environnement comme une réalité vivante quotidienne.

● Resumen

El Santuario Botánico de Gurukula (SBG) es un pequeño y remoto jardín botánico dentro de los bosques humedos tropicales de Karala, India, que está dedicado a la conservación y a la educación. En la mayor parte se trabaja con especies autóctonas, baja tecnología y con la población local; el énfasis es el generar y sostener una forma de vida que es sensible a la naturaleza. Varios miles de personas visitan el jardín al año, la mayoría procedentes del entorno. El SBG con sus variados habitantes vegetales y animales, es un excelente recurso para educar, tanto a niños como adultos, sobre la biodiversidad de la región y la urgente necesidad de conservarla. A través del estudio, el juego y la participación, y de actividades que utilizan todos los sentidos, se espera que los jovenes desarrollen un interés mas profundo y una preocupación por el bosque y sus comunidades naturales. La conservación no es una idea abstracta en esta situación donde es posible sentir y disfrutar de la conección entre los diferentes seres vivos y su medio ambiente como una realidad viva diaria.

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La Création du Réseau Pour la Conservation des Plantes Médicinales

El Genesis de la Red para la Conservación de Plantas Medicinales

The Genesis

of the Medicinal Plants Conservation Network (MPCN)

Summary

A pioneering initiative of conserving wild medicinal plants in southern India has been underway since 1993. This initiative coordinated by the Foundation for Revitalisation of Local Health Traditions (FRLHT) involves key players including the State Forest Departments, Research Institutes and leading NGOs of Karnataka, Kerala and Tamil Nadu. The Medicinal Plants Conservation Network (MPCN) was created out of the need to enable this conservation effort to grow into a sustainable movement, with its primary members of the network aiming to provide mutual benefits and services to the associate members, i.e. non-commercial and commercial users of medicinal plants.

Today MPCN includes 53 medicinal plant conservation sites established across different agro-climatic zones, covering nearly the entire diversity of medicinal plants of the region (around 1500 species of medicinal plants, including 76 Red-listed species), and 23 nurseries multiplying 550 species of medicinal plants. The MPCN members strongly believe in the involvement of local communities in the conservation activities on the understanding that rural communities, women and tribal people are among the key custodians and conservators of medicinal plants and indigenous knowledge.

A Living Tradition

Although India's medical heritage is many centuries old, it is an evolving and living tradition. Today, millions of people in villages, towns and cities across the country, depend upon the traditional medical systems. Around 8,000 species of medicinal plants are used in our health traditions, across the length and breadth of the country.

Unfortunately, these rich medical traditions have become marginalised in recent times. This is so because of various social, economic and political factors and not because the traditions in themselves are medically inefficient.

The Urgency to Conserve

Due to the rapid degradation and loss of natural habitats, juxtaposed with the over harvesting of some species, much of the biological wealth that is so intrinsically important to traditional systems of medicine has been destroyed or become endangered.

Today, there is an urgency to conserve India's medicinal plants. Although the point is not sufficiently understood, it is important to note that it is only a sound conservation strategy that can promote a backbone to a robust cultivation program. The latest global Red-list of plants brought out by The World Conservation Union (IUCN) presents a shocking picture: nearly 34,000 species or 12.5% of the world's flora is facing extinction. Based on these figures, it is reasonable to estimate that around 1,000 of India's 8000 medicinal plant species are also threatened. Threat Assessment studies carried out in recent years have placed about 200 species on the Red-list. If urgent conservation action is not taken immediately, we stand in danger of irretrievably losing our priceless heritage.

The Genesis of the Medicinal Plants Conservation Network (MPCN)

Since 1993, a major medicinal plant conservation project in southern India has been underway with the State

Left: Mr G. Hariramamurthi presentation on the work of FRLHT fascinated congress delegates

Right: Workshops conducted at the congress by FRLHT staff and a Traditional Healer were extremely well received by delegates.

Forest Departments of Karnataka, Kerala and Tamilnadu, Research Institutes and leading NGOs as the key players. Over 50 medicinal plant conservation sites have been established in the three states, across different agro-climatic regions, so that the entire diversity of medicinal plants of the region is conserved. This initiative of conserving wild medicinal plant genetic resources is the first of its kind in India. It is being coordinated by the Foundation for Revitalisation of Local Health Traditions (FRLHT), Bangalore.

The Medicinal Plants Conservation Network (MPCN) was created out of the need to formalise this pioneering conservation effort, and to link the conservation programmes initiated five years ago to the needs of users. The collective efforts of FRLHT, the State Forest Departments, Research Institutes and NGOs, can provide enormous mutual benefits, as well as services to both non-commercial and commercial end-users of medicinal plants.

MPCN Aims

- To facilitate sharing of resources and experiences amongst its members who may be NGOs, government departments, trusts, co-operatives, companies, research institutes and others who are actively involved in the conservation, cultivation and sustainable utilisation of medicinal plants.
- To facilitate links between the medicinal plant conservation organisations, who are its primary members and medicinal plant user groups, who are its associate members. These links may result in mutually beneficial projects and public support for the multi-faceted conservation activities of the network.
- To undertake advocacy with governments and other bodies on policy matters related to medicinal plant conservation and their sustainable utilisation.
- An essential feature of the work of MPCN members is the involvement of local communities in their work and its conviction that there is a need for benefit sharing with these communities so that they also gain from the growth of the medicinal plant sector. This community-oriented policy of the MPCN members is based on the understanding that rural communities, women and tribals are among the key custodians and conservators of medicinal plants and indigenous knowledge.

MPCN Conservation Sites

1. Medicinal Plant Conservation Areas (MPCAs)

Thirty Medicinal Plants Conservation Areas (MPCAS) have been established across different ecological regions of southern India by the State Forest Departments of Karnataka, Kerala and Tamilnadu; two more MPCAs are being established. MPCAs represent the in situ component of the conservation programme. These sites have an average area of 200 hectares with wide topographical and altitudinal variations (19 m to 2150 m). They cover 10 out of the 11 major forest types of southern India and harbour populations of most of the medicinal plant diversity of the region, including red-listed species. The MPCAs act as 'live field gene banks' of the medicinal plants of southern India.

2. Medicinal Plant Development Areas (MPDAS) and NTFP sites

MPDAs are small areas in NTFP circles and on degraded forests which are being developed for production of medicinal plants by planting the locally available indigenous species of medicinal plants and trees at these sites. The local communities and the Forest Department share the returns through sustainable harvesting of plants from jointly managed conservation areas, under the Joint Forest Management Scheme and/or Tamilnadu Afforestation Programme. Seven MPDAs have been established; six more are being established. These sites are to become sources of supply of high quality raw materials, which are sustainably collected from natural habitats.

3. Medicinal Plant Conservation Parks (MPCPS)

MPCPs are meant to conserve the region's medicinal plants diversity in ex situ conditions. Sixteen such parks have been established by non-governmental organisations and research institutes; two more MPCPs are being established. These ethno-botanical gardens also help in revitalisation of local health traditions.

They currently grow more than 800 medicinal plant species known to local ethnic communities, and provide planting material via their nurseries to the public. Some of these parks also include herbariums and seed and raw drug centres. They engage in training, local enterprise development, education and community outreach programmes they have the potential to develop into centres of reliable supply of planting materials and organically grown raw materials.

MPCN's Commitment to the Convention of Bio-diversity (CBD) and the Indian Bio-diversity Act

The Draft Bio-diversity Act of India based on CBD guidelines regulates access to native plant genetic material and traditional knowledge of plants for certain commercial purposes without the consent of the notified authorities specified in the act, and suitable benefit sharing arrangements with local communities. In this context, MPCN will encourage its members to implement the provisions of the Indian Bio-diversity Act.

Conservation Action

MPCN members have made considerable progress in the conservation of medicinal plants, via community participation activities. The in situ conservation programme initiated by the network is reported to be the most cost-effective way of conserving inter and intra specific diversity of medicinal plants. Around 1,500 species of medicinal plants, including 76 Red-listed species, are being conserved in and outside their natural habitats. The medicinal plants conservation efforts are being initiated in Maharashtra and Andhra Pradesh.

Community Outreach

In India, 90% of common ailments are reported to have local solutions based on local health traditions that use locally available medicinal plants. With the difficulty of resource mobilisation encountered by the providers of organised Public Health Control (PHC) services based on western medicine, the PHC has not been able to deliver 'health for all' in the country. It is also reported that these organised PHC services have been able to effectively cover only 30% of population.

In the light of above, the programme of conservation of medicinal plants and revitalisation of local health traditions has launched a Green Health Campaign. This is a strategy to promote the use of self-help methods through training programmes for local community members based on local health traditions that could lead to sustainable health care in PHC.

Green Health Campaign's slogan, ‘Medicinal Plants in Every Backyard - Primary Health Care in Every Home’ is intended to promote the use of local plants and local knowledge for primary health care, through training on the use of medicinal plants by self-help methods. The household herbal gardens, community herbal gardens, farm herbal gardens and sacred herbal gardens are promoted as individual and collective initiatives by the local communities to grow the medicinal plants that could be utilised to meet their PHC requirements, as and when required.

MPCN's members have established 23 nurseries, which are today multiplying about 550 species to meet the requirements of local communities.

Conservation Research

A research team engaged in the following areas of work supports the conservation programme:

- Floristic surveys
- Medicinal Plants Database
- Ayurveda Database
- Siddha Database
- Trade Database
- Propagation Database
- Seed Storage Database
- Herbarium
- Raw Drug Collection.

Educational Materials and Activities

The communication strategy for engendering local community support for the conservation programme involves the use of a wide range of media that local communities are familiar with, and which have the power to communicate the messages to the target groups. These are:

- illustrated signs
- thematic posters
- books on growing and using medicinal plants for PHC
- conventions of folk health practitioners
- exhibitions
- nature camps for students and teachers
- folk media such as puppetry, folk plays, etc.

Current Activities of the MPCN

The MPCN Secretariat brings out a quarterly newsletter ‘GeneNET’ for its members. A biannual conference of the network is organised to share and exchange experiences amongst members. On this occasion, an exhibition is also organised by MPCN members to inform the wider public of the activities of the network, including a display of MPCN members' products and publications. MPCN has a policy of inviting representatives of conservation organisations and others interested in MPCN to this meeting. MPCN also promotes state-level conferences of Nattu Vaidyas (folk healers) and women's green health organisations and medicinal plant exhibitions.

The Medicinal Plants Conservation Network has a Steering Committee, representing its members, which meets once a year to give direction to its activities. The Steering Committee decides on policies, services, budgets, programmes and projects that should be promoted via the MPCN Secretariat and MPCN members, so that individual member organisations and the network as a whole can become socially useful.

1. Information available to the public via the MPCN network

- ‘GeneNET’ newsletter
- information about plants in MPCN Nursery network
- names and addresses of primary members of MPCN.

2. Membership of the Network

All the organisations involved in the southern India medicinal plant conservation project, initiated since 1993, are founding members of the MPCN. These include the research institutes and NGOs who have established Medicinal Plant Conservation Parks (MPCPs), and Forest Departments who have established Medicinal Plant Conservation Areas (MPCAs) and Medicinal Plant Development Areas (MPDAs) in Karnataka, Kerala and Tamilnadu.

Primary Members of the MPCN are those organisations that are 'actually engaged' in community based activities related to conservation and sustainable utilisation of medicinal plants.

Below: One of the local villagers from Panamgode in Kerala shows Dawn Sanders (Chelsea Physic Garden, U.K.) some of the traditional medicines that were grown in her garden and have been prepared for use

Associate Members of the MPCN are the individuals, groups and organisations who are interested in medicinal plant conservation. Associate members include all potential medicinal plant user groups like urban and rural households, women's organisations, government departments, ISM physicians and their associations, research institutes, industry, NGOs, development aid agencies and schools and colleges.

▲ Resumé

L'initiative pionnière de conserver les plantes médicinales sauvages dans le sud de l'Inde a pris corps en 1993. Cette initiative coordonnée par la Fondation pour la Renaissance des Traditions Locales pour la santé (FRLHT) implique des acteurs-clé tels que le Département d'Etat pour la Forêt, des Instituts de recherche et des ONG influentes du Karnataka, du Kerala et du Tamil Nadu. Le Réseau pour la Conservation des Plantes médicinales (MPCN) a été créé pour permettre à cet effort pour la conservation d'évoluer en un mouvement pour le développement durable, dans lequel les membres fondateurs se donnent pour but de fournir de l'entraide et des services aux autres membres associés, que ce soit des utilisateurs commerciaux ou non commerciaux des plantes médicinales.

Actuellement, le MPCN gère 53 sites de conservation des plantes médicinales réparties dans différents secteurs agro-climatiques, couvrant pratiquement la totalité des plantes médicinales de la région (environ 1500 espèces, dont 76 espèces de la liste rouge) et 23 pépinières multipliant 550 espèces de plantes médicinales. Les membres du MPCN croient fermement à l'implication des communautés locales dans les activités de conservation et comprennent que les communautés rurales, femmes et populations des tributs, sont tout à la fois les gardiens et les conservateurs des plantes médicinales et des savoirs traditionnels.

● Resumen

Una iniciativa para la conservación de plantas silvestres medicinales en el sur de la India comenzó en 1993. Esta iniciativa, co-ordinada por la Fundación para la Revitalización de las Tradiciones de Salud Local (FRTSL) tiene entre sus principales participantes los Departamentos Forestales Estatales, Institutos de Investigación, y las principales ONGs de Karnataka, Kerala y Tami Nadu. La creación de la Red para la Conservación de Plantas Medicinales (RCPM) respondía a la necesidad de permitir que este esfuerzo de conservación se convirtiera en un movimiento sostenible con los principales miembros de la red ofreciendole beneficios y servicios mutuos a los miembros asociados, i.e., usadores comerciales y no-comerciales de las plantas medicinales.

Hoy la RCPM incluye 53 localidades para plantas medicinales establecidas a lo largo de diferentes zonas agro-climatológicas, cubriendo casi la totalidad de la diversidad de plantas medicinales de la region (aproximadamente 1500 especies de plantas medicinales, incluyendo 76 de la lista roja), y 23 viveros propagando 550 especies de plantas medicinales. Los miembros de la RCPM creen firmemente en la participación de las comunidades locales en las actividades de conservación, comprendiendo que las comunidades rurales, las mujeres, y la gente autóctona son los que principalmente mantienen y conservan las plantas medicinales y el conocimiento indígena.

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Education 'en douce': l'Art Subtil d'Éduquer Les Gens qui ne Sont Pas Venus Pour Apprendre

La Educación Disimulada: El Delicado Arte De Educara Aquellos Que no Vienen a Aprender

Education by Stealth:

The Subtle Art of Educating People Who Didn't Come to Learn

Summary

The majority of people visit botanic gardens for reasons other than learning. Nevertheless, when they are relaxed and enjoying themselves they are most likely to be receptive to overt or subtle messages which may change attitudes and influence behaviours. In this way they gain something from the experience of visiting a botanic garden which can be regarded as educational and relevant to the important issue of sustainability.

Interpretation can and should address this important opportunity by encouraging people to think about their relationship to the environment; enhancing their sensitivity to the natural world; and helping to shape attitudes and feelings towards nature. In achieving these objectives art may prove to have an equal role to science. The garden as a sanctuary for both safeguarding biodiversity and nurturing the human spirit, represents a very powerful theme relevant to the modern age. Recent research describes what visitors seek and what they get from visiting a botanic garden and how both of these may be influenced by effective and sensitive site interpretation.

Introduction

The Royal Botanic Garden Edinburgh (RBGE) has an educational programme which encompasses three complementary areas: school's and teacher education, community education and events, and public exhibitions. The most important resource, which is at the basis of all aspects of the programme, is the living plant collection. Often in deciding whether or not to take on a new project we ask ourselves the question could this be done as well somewhere else? If the special resources of the RBGE, and in particular the living plants, would provide some unique or original aspect to the project it is much more likely to be taken further.

Although primarily a scientific organisation, the educational programme of the RBGE is not exclusively about the understanding of science. It is designed to appeal to a wide range of user groups and aims to encompass artistic, aesthetic, horticultural and practical aspects of plant and environmental studies. More importantly it seeks to communicate with people who are not intentionally involved in any kind of formal study programme, including garden visitors who did not come to learn. This is what is referred to in the title of this talk as 'education by stealth'.

When we analyse attendance figures for RBGE we find that schools' programmes reach about 10,000 pupils, and adult and community programme, including the Edinburgh International Science Festival at RBGE, another 14,000 people each year. Approximately 150,000 people, mostly families, visit exhibitions in the Exhibition Hall. These numbers, however, represent only a small proportion of the more than 700,000 visitors to the Edinburgh Garden each year. We have established that the majority of visitors do not come to our garden, nor to most botanic gardens, with the specific aim of learning. Therefore, if we wish to impart some ideas or messages relevant to sustainability during a visit we will need to do this almost subliminally.

The definition of site interpretation which I offer: *'…the subtle art of educating people who didn't come to learn…'*, tries to reflect this.

Why do People Come to Botanic Gardens?

As a starting point it is worth considering why people do visit a botanic garden or arboretum. Many institutions have carried out visitor surveys but you will have your own ideas and these are probably quite close to the true picture. A quick poll to see why people visit sites represented at the congress produced a long list, including:

- to find peace and tranquillity
- to eat
- to read a newspaper
- to relax
- for recreation
- to play games
- to be with their family
- to escape from their families.

There seemed to be a consensus that to study or learn about plants was generally less important for the majority of visitors than something more obviously linked to seeking pleasure or satisfaction of some kind.

The thirteenth century mystic St Thomas Aquinas said *'You change people by delight. You change people by pleasure'.*

Aquinas understood that giving people a pleasant experience is more likely to put them in the mood for receiving some new ideas or information. This principle is well established in the advertising industry where companies compete to place their commercials

between the most popular and entertaining television programmes. What is more, we know from our surveys that people who have an enjoyable experience are the ones most likely to return. Repeat visits are important for the type of low level of interpretation I am proposing. Each exposure helps reinforce and strengthen even the most subtly-delivered messages.

In asking for ideas for why people visit gardens no one specifically mentioned healing. However, I believe that public gardens can, and do, offer people a form of healing, and although this may not necessarily be accepted by those who manage them, this may lie close to the root of their popular appeal among visitors.

We are all familiar with one aspect of the relationship between gardens and healing. Cultivating medicinal herbs, a central theme of this congress, has been a significant activity in both Western and Eastern cultures since the first gardens were planted. For millennia people have grown many plants used in herbal remedies as an alternative to collecting them from the wild. The European physic garden of the sixteenth and seventeenth century, styled on earlier monastery gardens, is just one example of horticultural activity devoted to the supply of medicines. An important supplementary role was the training of apprentice herbalists who in ignorance could as easily kill a patient as cure them if they made a mistake with their botanical identification!

In Europe there was, however, another incentive behind the creation of the first botanic gardens. Until the sixteenth century Christian theologians believed than the Garden of Eden actually existed somewhere on earth. The first explorations of the Americas, and in particular the discovery of tropical forests of 'perpetual summer', led to claims that Eden had eventually been found in the New World. However, when it was acknowledged that the Age of Discovery had not found the lost Garden of Eden, the search ceased and some wealthy and influential people set out to recreate paradise on earth. European botanic gardens of this period can also be viewed as an effort to assemble all the known plants of the world into Eden-like garden of earthly delights. Consequently from the start European botanic gardens had a dual function. They were practical collections of useful plants but also places of divine beauty where humans could feel on intimate terms with their Creator - havens for the soul. Through the combination of these two roles gardens were important in the nurturing and healing of body, mind and spirit. Therefore, there is nothing particularly radical or innovative in suggesting that people 'feel better' from the experience of visiting a garden. On one hand this idea receives wide acceptance while on the other we find it rarely acknowledged within mission statements, strategic plans or annual reports of the world's leading botanic gardens and arboreta.

The Secret Garden

In the nineteenth century children's classic *The Secret Garden* author Francis Hodgson Burnett recognised both the security aspect and the healing power of gardens. The story

Left: Educating people who are not motivated to learn is a challenge for all botanic garden educators, Dr Ian Darwin Edwards (left) presented on this important topic

tells how three children discover a neglected walled garden and gently coax it back to life. As the momentum of an English Spring builds, they find themselves swept along in the current of renewal and rebirth and believe that what is happening to 'their' garden is pure magic. The excitement and fulfillment that they all share in the garden becomes their most over-riding preoccupation. One of the children, a spoilt, hypochondriac boy of ten, who has spent his life confined to a wheelchair due to a mysterious and one suspects largely psychosomatic illness, learns to walk for the first time, gaining inspiration from watching the first faltering steps of a young deer fawn.

Wrapping sound moral education inside a sentimental story was a popular device among Victorian writers but the parable of *The Secret Garden* seems at least as relevant for today's screen-addicted children as it was when it was written. Many young people seldom have direct experience of animals beyond domestic pets and for many nature is confined to the virtual world of TV or computer simulations. In *The Secret Garden*, adults are excluded and the children can pursue their natural instincts for play and discovery, using their imaginations without inhibition. Protected behind high stone walls from unknown dangers, characterised in the book by a wild and windswept Yorkshire moor, the trust between the children also grows and they become involved in their own magic.

The children do not seek to dominate the neglected garden but rather to coax from the earth the potential which they believe to be buried or sleeping. The result is an earthly paradise where wildness still has a place and the scent of colourful flowers is accompanied by the flight of butterflies and songs of wild birds. The other transformation, in the character and health of the children themselves, occurs in parallel to the changes in the garden. The children's senses are revived as they become intoxicated with the scent of the roses and feel and smell the wet earth in their hands. It is ultimately through this direct contact with nature their young lives become rich and meaningful.

Burnett clearly believes in the power of fresh air and healthy exercise in creating strong bodies but also acknowledges the increase in confidence which can be gained from taking care of something and the changes derived from focusing beyond the self to the wider world.

The Secret Garden, like so many children's stories, is a fantasy based on simple truth. In this case the underlying message is that gardens, through their remarkable ability to stimulate the complete range of human senses, are capable of helping people who have been deprived of sensory experience or allowed their perception of the natural world to deteriorate. Those of us that live in urban areas may be unconsciously forced to reduce our sensitivity to disagreeable or overpowering environmental stimuli. Out of sheer necessity we have to shut our ears to the noise of traffic, block off our noses to the smell of car exhaust fumes, screw up our eyes in the glare of headlamps and turn our heads from the ugliness of litter lying in the gutters. Only in the comparative safety of urban green spaces can we timidly explore the more rich scents, colours, reflections, calls and textures of nature.

Matthew Fox, the renegade Catholic priest who has become a kind of latter day St Francis of Assisi, describes how the urban dweller is surrounded by stories which are 'cleverly and expensively' told by the media (Fox 1993). He feels that advertising people are ever encouraging us to fill our lives with the 'goods and goodies of twentieth century Western society', things we don't need and that are damaging to our health or the environment, in order to fulfill a fantasy which rarely leaves one's mind content but is more likely to generate an even greater thirst. Fox argues that we need an 'alternative story' which fills the need and satisfies the human condition. Interpretors should be trying to discover and tell this alternative story. The challenge is to demonstrate gardens, with their rich and diverse array of sensory offerings are able to provide a stimulating 'high' which is more fulfilling and long-lasting than, say, a can of *Coca-Cola* or a new compact disc.

Many people believe that human beings have an innate capacity to appreciate nature in an aesthetic rather than purely scientific ways - a phenomenon which Edward O. Wilson calls biophilia (Kellert and Wilson 1993). If we accept the biophilia hypothesis then it follows that gardening, which involves manipulating living things to enhance a landscape's aesthetic appeal, expresses the same basic human need to be in touch (sight, smell, taste and sound) with nature. Gardens act as a catalyst to enable people to discover this important part of their psyche and to be involved in a practical and immensely satisfying way with the environment. For many people gardening does offer an alternative and ultimately more rewarding experience than consumerism. In the UK, although shopping is considered the most popular recreation, gardening is probably a close second. However, in the wake of increasing popularity gardening has also attracted its own form of consumerism as garden centres, glossy magazines and TV garden 'make-over' programmes proliferate.

Using Metaphors

At the 1998 BGCI Congress in Kirstenbosch, South Africa, Ally Ashwell of the National Botanic Gardens gave a presentation in which she asked us to consider our organisations as metaphors. Her examples were more to do with the corporate structure of an organisation than its functions but this set me thinking about some of the metaphors we use to describe the role of botanic gardens and their appropriateness as starting points for planning themed interpretation.

The design of gardens, from earliest times, involved the frequent use of metaphors and symbolism. Modern botanic gardens also have many metaphors. For example:

- Many gardens strive to cultivate rare plants which are in danger of extinction in the wild in ex situ conservation collections. An appropriate and frequently used metaphor for these gardens might be a *botanical ark*.

- The traditional educational value of botanic garden reference collections, not only in teaching plant taxonomy and classification, but for illustrating important botanical concepts, such as pollination or seed dispersal, has led to the description of botanic gardens as *living encyclopedias* demonstrating in a unique way the diversity of plantlife.
- A third metaphor might be a show case for botanical diversity. By displaying to a wide public (over 150 million people a year worldwide) the greatest possible variety of plants, and providing interpretation on their value and usefulness, botanic gardens are an important *shop window* for science and horticulture.
- Another useful metaphor and one particularly appropriate for a main theme of this Congress is the *medicine chest*. As described above botanic gardens from the earliest times have provided herbalists with a wide range of valuable plants and by supplying cultivated material have helped to conserve wild sources.

My favourite metaphor, however, is the *sanctuary*. Mediaeval engravings of gardens show a dark or mysterious forest beyond the protective walls, a place with wild animals and other untold dangers lurking suspiciously in the shadows. In modern times it is likely to be an urban landscape outside the garden and the environment in our cities becomes less habitable with each decade. Beyond safety of our carefully cultivated collections plants are under threat but so too is our own species. There is a real danger that we are fouling our nest to such an extent that we could make large areas of our planet unlivable in the future. The urban environment is becoming increasing less suitable for human existence and as already described our reaction has been to turn down our sensory perception to a low level in order to survive the onslaught.

Safe within the sanctuary of the garden we can see, feel and breathe naturally. Green spaces offer revitalisation and I am aware that for many people they provide restorative energy with which to carry on with their daily tasks. This is not a new discovery. My ancestors and traditional communities throughout the world experienced similar empowerment within the greenness of their sacred groves. But, then again, this is a probably lesson that every generation must learn for themselves.

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▲ Resumé

La majorité des visiteurs des jardins botaniques viennent pour autre chose qu'apprendre. Toutefois, quand ils sont détendus et contents, ils sont plus réceptifs aux messages clairs ou cachés qui les invitent à changer leurs attitudes et influence leurs comportements. Ainsi, ils retirent quelquechose de leur expérience de visite d'un jardin botanique qui peut être considéré comme lieu éducatif et adapté à l'enjeu important du développement durable. L'interprétation peut et doit profiter de cette opportunité pour encourager les gens à réfléchir à leur rapport à l'environnement, à accroître leur sensibilisation aux éléments naturels et les aider à se construire des attitudes et des sentiments envers la nature. Le jardin, en tant que sanctuaire à la fois pour sauvegarder la biodiversité et nourrir l'esprit humain, constitue un thème très fort pour l'époque moderne. Une récente recherche a étudié ce que les visiteurs recherchent et ce qu'ils trouvent en visitant un jardin botanique et comment cela peut être influencé par une interprétation du site efficace et sensible.

● Resumen

La mayoría de las personas que visitan los jardines botánicos lo hacen por razones ajenas al aprender. Sin embargo, cuando están relajados y disfrutando están mas dispuestos a ser receptivos a mensajes tanto obvios como sútiles que puedan cambiar actitudes e influenciar el comportamiento. De esta manera ganan algo de la experiencia de visitar un jardín botánico que se puede considerar educativo y relevante al importante tema de la sostenibilidad.

La interpretación puede y debe aprovechar esta importante oportunidad animando a la gente a pensar sobre su relación con el medio ambiente, incrementando su sensibilidad con el mundo natural; y ayudando a formar actitudes y sentimientos hacia la naturaleza. El arte puede tener un papel equivalente a la ciencia en lograr esto. El jardín como santuario tanto para salvaguardar la biodiversidad como para nutrir el espíritu humano representa un tema muy poderoso y relevante a la edad moderna. La investigación reciente explica que es lo que los visitantes primero buscan y luego encuentran en una visita a un jardín botánico y como esto puede ser influenciado por un sistema de interpretación efectivo y sensible.

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Combattre la **Flore du Supermarché**

Batallando Contra la **Flora del Supermercardo**

Fighting the Supermarket Flora

Summary

New generations are technologically advanced; they watch television, they play with computers, and they navigate on the Internet. But in the multimedia age, society is loosing its culture day by day; popular traditions and nature's culture are no longer a part of modern life. If you ask a child 'What is a tomato?' they will probably reply that a tomato is a red sauce that is generally put on fries when having a meal in a fast-food restaurant.

Taking this into consideration, the University Botanic Garden of Genoa, Italy, has developed an education programme to fight the loss of traditional knowledge and uses of wild herbs for medicinal and cooking purposes. The main task of the data collection work was the conservation of a very old Mediterranean culture. Local experiences, many centuries old, have built up popular belief in using plants for life; herbs were used for everyday meals and also had important medicinal value. During a themed tour of the garden, comparisons are made between old uses of medicinal plants and the new chemical analysis of them in order to increase participants' understanding of how often they are strongly related. In addition, special practical workshops are organised that focus on the identification of edible plants and participants are shown how to use them in simple but tasty recipes.

Italian Culture

Italy is commonly considered to be one of the most cultural countries in the world. Wherever you go in Italy you can find a cultural link, an historical monument, or a sample of art. Our nation is regarded as being one of the most important milestones in the development of world culture.

When evaluating the Italian culture in such a way one might even think of it as one of the most complete in the world. In reality, however, a deeper analysis shows that its main feature has been and still is the humanistic element. Poetry, literature, music, science and art are mainly referred to by using metaphors from the animal kingdom and very few elements are linked to plants and the plant kingdom.

Considering this, it is easy to understand why nowadays, in our modern way of life, people don't care for wild life in the form of plants. The best examples we can use are feature films on nature; they show animals and threatened species from all over the world, but threats to plants are rarely presented. Examples of conservation slogans include: 'save the panda in China' and 'we protect the honey from Sardinia', but rarely do you hear about problems of the Italian flora and vegetation. Conservation groups consider general problems such as pollution, the increasing number of houses on the territory and promotion of nature reserves, some of which are important animal habitats (e.g. for eagles, seals, and ibex's). These groups are generally unaware of, or not interested in, the presence of rare plants. They don't know where the rare Saxifraga species occur, or in which location some rare alpine species tries to survive. This kind of information is only known to a handful of specialists and it is therefore difficult to raise awareness of these threatened plants because they don't have a widespread impact on public opinion. This fact is related to a general lack of awareness about the plant kingdom.

Modern Cultural Reality

New generations are technologically advanced and culturally developed. Two out of three children have a computer to play video-games and one out of five boys has a computer to surf the Internet. Children have the opportunity to travel all over the world sitting comfortably in their chair at home. They receive input from a large number of people and places that raises the question: do they really have a greater culture?

This cultural development has brought a large quantity of innovations; new things and actions exist now that a few years ago were inconceivable. However, what do the children learn? Are they confused? Have children the right vision of reality? The multimedia age society is losing its culture day by day. We believe that a culture is growing up aided by the quantity of information, not by the quality. Nowadays children are bombarded with new terms, images, news, and links everyday, but they don't appear to have the opportunity to connect all the data they receive. To use a computer seems easier than reading a book and understanding its message. We are giving a fast-culture with immediate results, but all rapid information and learning elements are forgotten in such a short time.

The truth is that after a few days children remember only about 20% of what they saw or heard. This new generation lives in an unreal world where they know how to navigate the Internet but do not know what a POP account is. They rarely know the origin of the everyday world, nor the origin of each object they touch or use. By increasingly using computers

in our modern culture we produce a reality that more and more resembles that of a virtual culture.

Modern life teaches us to run and run: do we always realise what we are doing? On the other hand the old education system is considered out of date and needs to be discarded and forgotten. This idea allows children to forget what the past actually was and it also means that they can't relate to the troubles humankind has encountered through the centuries - before we arrived where we are today, namely at an age where we use the computer as an instrument to work with. Pupils now believe in a new God, the God of technology. They are no longer interested in knowing popular traditions and nature culture linked to their living area and ancestors.

Children are taught to have everything in abundance. When anyone needs anything, they can buy the finished product – sometimes made through a complex industrial process - without taking into consideration the many and different natural elements involved in the production.

Ask a child what a tomato is, they might answer that tomato is a red sauce generally used upon fries when having a meal in a fast-food restaurant; or a typical answer of a child might be something like: 'tomato is a fruit usually collected in a supermarket'. A large proportion of children have never seen a tomato plant, a potato plant nor any other edible plant and therefore they are not able to recognise those plants in a kitchen garden.

We don't want to condemn the computer as a demon, we need to realise that it is an instrument we use to communicate and explain this to the next generation. At the same time, it is important to remember that the computer is supposed to work for us and that we don't work for the computer!

The Supermarket Flora

What do we mean by the supermarket flora? According to the results of a quiz with primary school children, we realised that their knowledge about plant nature is linked to a specific idea: their plant kingdom does not contain roots, leaves, flowers and fruits or even trees, shrubs and herbs but mainly tins, bottles, packages, bags, and boxes within the industrial product of some plants (it doesn't matter which they are!).

On this basis we can define a multicoloured flora of different shapes and materials which usually live in a very special habitat indeed; the supermarket. These plants love shelves and stands, they need neon light, they grow very strictly next to each other, during some seasons they are discounted, they are collectable everyday during a year, and they need neither a water supply nor pollinator insects. In a way, all of them could be considered to be threatened plants since if they don't satisfy common taste they are taken off the market!

The tomato, for example, is a plant with different morphological shapes such as metal boxes, square tetra-packs, long or short bottles, with many subspecies if you consider all the different types of sauces you can find: ketch-up, bolognese sauce, mushroom sauce, Mediterranean sauce and so on.

We posed questions to different classrooms and to a number of boys that we met on the street. We asked them what they might need in order to prepare a red sauce for spaghetti or a pizza. We found that they knew all the correct ingredients of the recipe (they will be marvellous cooks!), but when we asked where they could find the products, they answered: '…at the supermarket!', and when we asked if there are any other possibilities to get them, they replied that they didn't know.

The School Curriculum

The teaching of natural science and biology in Italian schools generally happens according to the same framework, and has been taught using the same methods for several years. The ministerial programmes are followed in a pedantic way, without outside excursions and laboratory activities in the majority of classrooms and schools. The reason for this inactivity seems to be mainly due to the teachers and their style and/or willingness to use innovative methods.

The teachers of primary schools do not seem to be sufficiently prepared: their styles are formed from pedagogic and literary points of view, leaving out the importance of science. On the other hand, a teacher of science at high school level might have achieved a degree in biology, but knowledge (at university level) of botany or other disciplines linked to the plant kingdom may be considered of little importance.

In general we have found that teachers focus their lesson preparation on what they studied at university and year after year they repeat the same lessons, sometimes with great monotony. To find any up-to-date courses where teachers can verify their preparation in the Italian school curriculum is a difficult task indeed.

We have also found an issue with the communication techniques of teachers and their lack of understanding of what interpretation is. A type of recycling system exists amongst school educators, meaning they often copy and re-use their own limited experiences over and over again. Very few manage to communicate their subjects to their students transforming their discipline in a loving way. Perhaps this is because they don't actually love their job.

Generally one can assume that teachers have good will and perhaps even good ideas with regard to teaching their subjects, but in some cases they don't appear to put enough effort into showing their initiative and they often have neither the relevant information, nor sufficient training, and therefore not enough competence in this area.

Looking to the example of Genoa, one can point out the fact that teachers who have the intention to teach about environmental education appear to have to fight against the lack of

awareness of their institutions and their pupils' parents. They therefore have to fight to get funds from their school budget, and for spaces available in the schools, as well as for the amount of time they have to spend with pupils per week (science is a secondary subject in Italian ministerial programmes). They must overcome these obstacles and unfortunately are only able to achieve limited results.

The teachers who are able to offer something a little different are rare. In Italy there is no initiative to teach educators how they can motivate children to learn about science, nature and the environment. The few initiative schemes that do exist have only been around for a short time. The teachers often ask outside education agencies to collaborate and help them with environmental education activities, but these agencies must be paid and not all schools can afford to do this. Few school books have new ideas. They often propose the same ideas and rarely suggest new activities! In the libraries one can find books about new laboratory experiences, but teachers are rarely informed about such books or perhaps they can't access them due to administrative problems or because of insufficient structures within the schools. These complications regarding scientific and botanic education, give an important and responsible role to botanic gardens in our day and age (and in this case in our town).

The Education Mission of a Botanic Garden

The botanic garden has an enormous potential in science education: it contains a great variety of botanical species and it is a place where people can come to learn about different natural environments. Moreover, it can be seen as a kind of photograph of the plant biodiversity of the world and it offers the best material for the diffusion of a scientific culture and the promotion of the importance of the plant kingdom in our modern life.

We don't need to emphasise the didactic importance of a botanic garden, but educators all over the world should consider its importance and remember that in a botanic garden there is the opportunity to look, observe, explore, and even play with plants.

In some nations, mainly in places with a Latin culture, there is the potential for botanic gardens to focus schools on what is lacking in teaching of subjects such as botany and environmental and biodiversity conservation.

In Italy the education system needs to increase awareness of the role of the plant kingdom in our daily lives. Italians are not yet informed enough to understand this strong link, and education is the first and necessary step before one can address the subject of conservation. However, at present this model is not adhered to, neither by schools, not the media nor is it in line with popular opinion. The result is that a lot of well meaning words are spoken in favour of nature conservation but the real issue is not understood: namely that we all are involved in this mission and it's important to incorporate this kind of thinking into each and every action in order to raise the awareness of the dangers that exist with regard to nature conservation. This idea could also be called 'sustainability education'.

Sustainable education in a developed country means to help everybody to develop a new form of sensitivity on sustainable development, ethical and environmental problems. The environmental education must incorporate responsibility and care for our environment. The paper of principles says that the renewal of education structures and formative systems is a very important part of the project. This is important for administrations, common people, workers and companies, schools and education agencies.

Environmental education is not easy to deliver. It is not sufficient to declare the ideas in which we believe, they also need to be presented in a particular way. In any case we need innovative modifications with regard to teaching and learning of traditional systems. The educational intention might be inoperative if it is not supported by a realistic demonstration of what we want to teach.

In summary, the Italian botanic gardens could change opinions using their living collections and help to develop a new generation that love plants.

What Does Genoa Botanic Garden Do?

Taking this into consideration, the University Botanic Garden of Genoa developed an education programme to fight the 'supermarket flora'.

The Botanic Garden has an Education Unit that is composed of members belonging to the University and to a private education agency operating in the garden. Last year the University defined the education and cultural strategies for its botanic garden and it issued a complete plan of action. The Education Unit transformed the plan into an annual education programme for pupils of any age.

The two main areas of focus are teacher training and developing a relationship with public education organisations. The overall aims of the programme are to:

- Provide an understanding of the plant kingdom to the general public.
- Raise awareness of issues related to plant conservation and biodiversity management.

Fighting the Store Flora

How is possible to fight the supermarket flora in reality? The botanic garden is elaborating on this new issue and all new activities and games will be developed with this aim in mind. As it is neither possible, nor possibly desirable, to change modern society and life in a developed country like Italy, we can only try to increase the awareness of how the plant kingdom effects and takes part in our everyday life. Increasing knowledge and awareness is the goal we would like to achieve. This is part of a new way of thinking and in order to pass it on we have come up with some new games and activities. Here are few examples:

44

The courier of alimentary products

Children presumably associate supermarket products with natural alimentary products.

Objective:
children will realise that everything they eat is derived from plants directly or indirectly. They can then observe the strict linkage between the products desired in daily life and plants these products derive from.
Instructions:
There are some fruits (tomatoes, pineapples, potatoes, oranges, coffee beans, olives), and some alimentary products (ketchup, spaghetti, chips, flour, jam, pizza, coffee, oil, pineapple tin), the products are kept in random order in the glasshouse. Children are asked to form two squads, each with a different coloured flower, and they begin by associating products with fruits. Every couple gain one point and the winner is the group that has the most points. Then the children must find another partner and we ask them to observe supermarket stands and try to associate the ready made product with its natural ingredients.

Teacher training

During the year we will organise several courses for teachers. We have also prepared a working week called 'At school in the Botanic Garden' to show teachers a new way of looking at, teaching of and playing with science.

Objective:
teachers revise their knowledge and learn new teaching methods for science lessons that are more pleasant and stimulating.
The subjects are: plants and their earth environments, flower leaf and fruit, particular spices used in every day life.

Artistic techniques

Children colour and compose artistic drawings.

Objective:
children gain confidence with the plant environment.
Instructions:
children associate different colours, play with different materials, observe different forms and use plant pieces in a creative way. They express their creativity, fantasy and their communicative capacity without limits.

Save a flower

Very young children help a flower in a difficult moment of its life: they help the flower to survive, to pollinate and to carry fruits.

Objective:
to raise awareness of the life, importance and purpose of a flower and other natural elements; to observe an entire cycle of a flower life.
Instructions:
a story is narrated about a forest that experiences a drought: many animals and plants experience difficulties, but the *mowha* flower (referred to in the Kipling story), in particular, is the most important because its death would mean that the water supplies would cease to exist. So this plant would appear to the children and ask them for help. They will then (hopefully) understand that they must look for water and they would be taught that the plant needs an insect for pollination. They might then look for a bee and for another flower in the glasshouse. They succeed, with our help, to obtain some fruits and sow the seeds.

Left:
Some children struggle to associate the packaged food they find in a supermarket with the plant kingdom

Pollination game

Young children are dressed up as flowers with pistils and stamens, and they learn how an insect can pollinate them.

Objective:
learning through enjoyment about the ways in which pollination occurs and to consider different problems that can and might occur in nature.
Materials:
different leaves, woods, fruits, paper, colours, fingers and fantasy. We also give them cards of insects and animals.

We play with nature

Children create flowers.

Objective:
to learn about flower structures and all their parts.
Materials:
coloured paper (origami), wrinkle paper, straws, elastics and flowers pictures.

The Preboggion school

In this activity people learn to identify and cook a mixture of wild edible herbs (*Preboggion*) that grow in Liguria. Since the Crusaders' period the *Preboggion* had been one of the most important elements in the regional diet.

The main task of collecting the data was to conserve a very old Mediterranean culture. Local experiences, many centuries old, built up popular beliefs about using plants in everyday life. Common herbs were used for everyday meals and also in healing situations.

Objective:
nowadays is very important to show the general public, especially the younger generation, which plants could be named *'good doctor'* or how to prepare a tasty soup with herbs otherwise considered as weeds.
Instructions:
for medicinal plants the comparison between old uses and new chemical analysis of these plants is shown during a tour of the garden, in order for participants to understand how often they are still strongly related.

Special practical workshops are organised for the identification of edible plants with demonstrations on how to use them in simple but tasty recipes.

▲ Resumé

Les nouvelles générations sont technologiquement avancées. Elles regardent la télévision, jouent avec les ordinateurs et naviguent sur internet. Mais à l'ère du multimédia, la société perd sa culture jour après jour. Les traditions populaires et la culture de la nature ne font pas partie de la vie moderne. Si vous demandez à des enfants 'qu'est-ce qu'une tomate?' ils vous répondront probablement que c'est une sauce rouge que l'on met généralement sur les frites quand on va au restaurant fast food.

Partant de ce constat, le jardin botanique de l'Université de Gênes a développé un programme éducatif pour combattre la perte des savoirs traditionnels en se servant des plantes sauvages pour illustrer l'aspect médicinal et culinaire de la flore. La principale tâche assignée aux informations tirées de la collection est la conservation d'une culture méditerranéenne très ancienne. Des expériences locales, vieilles de plusieurs siècles, ont établi une confiance populaire dans l'usage des plantes. Les plantes étaient utilisées dans la nourriture de tous les jours et leur importance médicinale était reconnue. Au cours d'une visite thématique du jardin, on fait des comparaisons entre les usages anciens des plantes médicinales et leurs composés chimiques analysés pour aider les visiteurs à comprendre combien les deux sont liés. Des ateliers pratiques spéciaux sont organisés. Ils ont pour thème l'identification des plantes comestibles et les participants peuvent voir comment il est possible de les utiliser grâce à des recettes simples et agréables.

● Resumen

Las nuevas generaciones están avanzadas tecnologicamente; miran la televisión, juegan con los ordenadores, navegan por el Internet. Pero en la edad del Multimedia, la sociedad pierde su cultura dia a dia; las tradiciones populares y la cultura de la naturaleza ya no son parte de la vida moderna. Si le preguntas a un nino, - Que es el tomate ? – probablemente conteste que el tomate es una salsa roja que se le pone a las patatas fritas cuando se come en un restaurante de 'fast-food'.

Partiendo de este punto de vista, el Jardín Botánico de la Universidad de Genoa ha desarrollado un programa educativo para contrarrestar la pérdida del tradicional conocimiento y usos de las plantas silvestres de valor medicinal y culinario. El mayor objetivo del trabajo de recolección de datos era la conservación de una cultura Mediterranea muy antigua. La experiencia local, a veces a traves de muchos siglos, ha reforzado las tradiciones populares del uso de las plantas en la vida cotidiana; las hierbas se usaban en la alimentación diaria y también tenían un importante valor medicinal. Durante una visita temática al jardín, se comparan los antiguos usos medicinales de las plantas con análises químicos recientes para que los participantes comprendan mejor como muy frecuentemente estas características están aun relacionadas. Se organizan talleres especiales sobre la identificación de plantas comestibles y se le demuestra a los participantes como se pueden usar en recetas simples pero apetitosas.

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Unfortunately, at the last minute Dr Locoro was not able to attend the 4th International Congress on Education in Botanic Gardens. This article is the paper that she had intended to present at the congress.

Snippets from India

4th BGCI International Congress

1
The TBGRI staff were always available to help congress delegates

2, 3, 4 and 7
Workshops provided great opportunities for discussion and sharing

6
BGCI's Dr Peter Wyse Jackson accepts a cheque from Robert Brett (formerly RBGKew, UK) and Dr Hew Prendergast (RBGKew, UK) who organised a fund raising event to help Abel Atiti (Kenya) attend the congress

5, 8
The Poster Fair was a wonderful opportunity for people to showcase their work and share their ideas and resources

The organisers of the 4th International Congress on Education in Botanic Gardens are deeply grateful for the generous support provided by:
Air India; British Airways Assisting Conservation; Morel Trust; Staff of the Royal Botanic Gardens Kew UK; Tata Tea Ltd; The British Council (Chennai); Zandu Foundation for Health Care (Mumbai)

9
During the field trip to the village of Panamgode, delegates learnt about some traditional Keralan primary health care

10
His Excellency The Governor of Kerala, Mr. Justice Sukhdev Singh Kang (2nd left), inaugurated the Congress, BGCI's Secretary General, Dr Peter Wyse Jackson, took part in this auspicious occasion

11
TBGRI staff took congress delegates on a guided tour of the garden

12
A traditional Indian Welcome Dance greeted delegates at the congress opening ceremony

13
Patty Lyons (USA) met some of the children from the village of Panamgode

14
Congress organisers get together just before the opening ceremony

15
Dr Lata from TBGRI was always on hand to help congress delegates and BGCI staff

Was your country represented?

Australia	Poland
England	Russia
Estonia	Scotland
France	Seychelles
India	Singapore
Italy	South Africa
Japan	Sweden
Kenya	Switzerland
La Reunion	United States
Mexico	Wales
New Zealand	

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Resources

Recursos

■ resources

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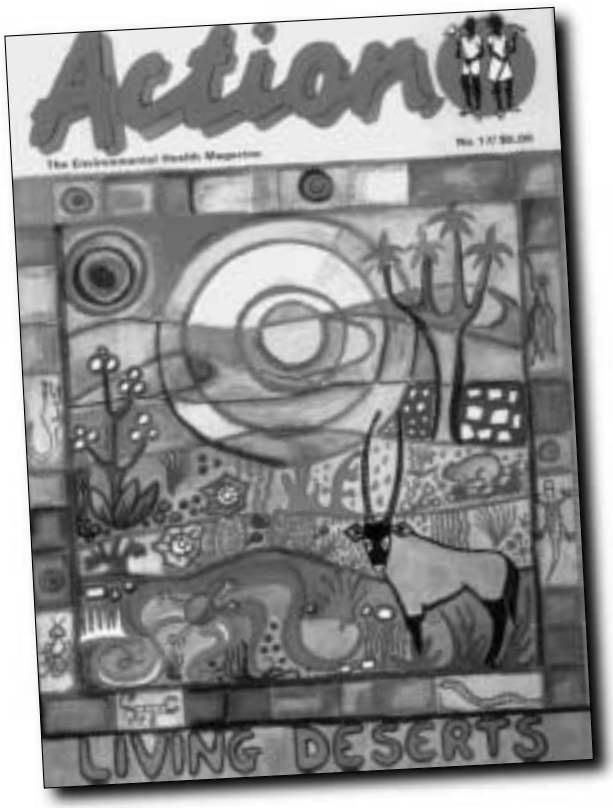
● recursos



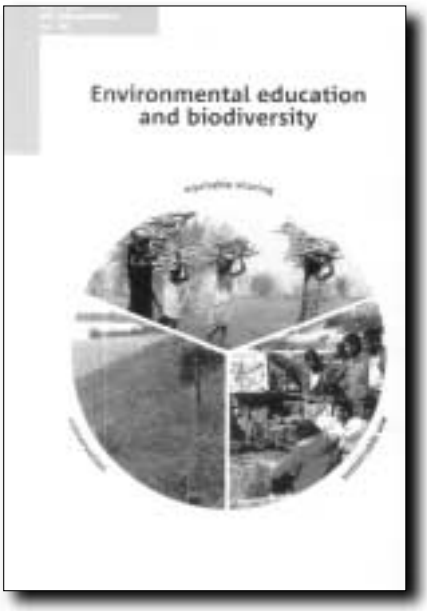
Action
Action, P.O. Box 4696, Mukuvisi Environment Centre, Harare Zimbabwe. Email: actionmg@cst.co.zw; Website: http://www.cst.co.zw/action
Action was established in Zimbabwe in 1987 to stimulate interest and debate in environmental and health issues in schools and communities. The organisation supports and promotes partner organisations in Southern Africa including Zimbabwe, Zambia,

Action
Action, P.O. Box 4696, Mukuvisi Environment Centre, Harare Zimbabwe. Email: actionmg@cst.co.zw; Website: http://www.cst.co.zw/action
Action a été fondé au Zimbabwe en 1987 pour stimuler l'intérêt et débattre des problèmes d'environnement et de santé dans les écoles et les communautés. L'organisme soutient et encourage des partenaires du sud de l'Afrique, y compris aux Zimbabwe,

Acción
Action. P.O. Box 4696, Centro Ambiental Mukuvisi, Harare Zimbabwe. Email: actionmg@cst.co.zw; Website: http://www.cst.co.zw/action
Action fue establecida en Zimbabwe in 1987 para estimular el interés y el debate en temas ambientales y de salud, en escuelas y comunidades. La organización apoya y promueve la organización de socios en Sudáfrica

■ resources

Botswana, Namibia, Lesotho and Swaziland. Their magazine Action The Environmental Health Magazine is produced quarterly and features topics such as plant and animal adaptations, food webs, ecosystem development and the maintenance of community health and well-being. Action also produce teacher resource materials and posters.



Environmental Education and Biodiversity
Wals, Arjen (1999) (ed)
National Reference Centre for Nature Management, P.O. Box 30, 6700 AA Wageningen
The Netherlands.
ISBN 90-75789-03-3.
Tel: (31) 317 474 801
Fax: (31) 317 427 561.
Environmental Education and Biodiversity details a procedure that has been constructed for developing the theme of biodiversity within environmental education programmes for human development. The procedure includes the following:

- analysing meaning of biodiversity
- determining one or more perspectives based on the general learning goals of environmental education
- setting specific learning objectives, selecting (sub) themes for learning

▲ disponibles

Botswana, Namibie, Lesotho et Swaziland. Leur revue, *Action The Environmental Health Magazine*, est un trimestriel couvrant des thèmes comme les adaptations des plantes et des animaux, les chaînes alimentaires, l'évolution d'écosystème et la surveillance de la santé et du bien-être des communautés. Action réalise également du matériel didactique et des posters.

Environmental Education and Biodiversity
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ISBN 90-75789-03-3.
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Fax: (31) 317 427 561.
Environmental Education and Biodiversity détaille une procédure élaborée pour exploiter le thème de la biodiversité dans les programmes éducatifs sur l'environnement pour le développement humain. La procédure inclut les éléments suivants:

- analyser les ressources en biodiversité
- déterminer une ou plusieurs perspectives basées sur les objectifs généraux de l'apprentissage de l'éducation à l'environnement
- établir des objectifs spécifiques d'apprentissage, sélectionner des thèmes ou des sous-thèmes d'apprentissage
- déterminer la valeur de la biodiversité.

La procédure a pour objectif: d'aider les promoteurs des programmes d'étude, les enseignants, les groupes de soutien éducatif et les animateurs spécialisés en environnement; de donner une signification spécifique à la biodiversité; et d'analyser la manière dont la biodiversité est utilisée par les sciences, les technologies et la société.

La procédure a été élaborée suivant une vaste étude qui a exploré les différents usages, significations et valeurs associés à la biodiversité. De plus, les contextes dans lesquels la

● recursos

incluyendo Zimbabwe, Zambia, Botswana, Namibia, Lesotho and Swaziland. Su revista *Action The Environmental Health Magazine* is producida trimestralmente and presenta temas tales como adaptaciones en plantas y animales, webs de alimentos, desarrollo del ecosistema y el mantenimiento de la salud y bienestar de la comunidad. Action también produce recursos materiales para maestros y posters.

Educación ambiental y Biodiversidad
Wals, Arjen (1999) (ed) National Reference Centre for Nature Management, P.O. Box 30, 6700 AA Wageningen
The Netherlands.
ISBN 90-75789-03-3.
Tel: (31) 317 474 801
Fax: (31) 317 427 561.
Environmental Education and Biodiversity detalla un procedimiento que ha sido construido para el desarrollo del tema de biodiversidad dentro un programa de educación ambiental para el desarrollo humano. El procedimiento incluye lo siguiente:

- analizar el significado de biodiversidad
- determinar una o más perspectivas basadas sobre el objetivo general de educación ambiental
- establecer objetivos específicos de aprendizaje, seleccionando (sub) temas para el aprendizaje
- conceptualizar la biodiversidad
- establecer el valor de la biodiversidad.

El procedimiento intenta ayudar el curriculum de promotores, maestros, personal de apoyo educativo y educadores ambientales dando un significado específico a la biodiversidad y ayudando a los estudiosos a analizar la forma en la que la biodiversidad es usada en la ciencia, tecnología y en la sociedad.

El procedimiento fue desarrollado despues de un estudio comprensivo que exploró los diferentes significados, valores y usos asociados con la biodiversidad. Además, los contextos en los cuales la biodiversidad podría

■ resources

- contextualising biodiversity
- establishing the value of biodiversity.

The procedure is intended to help curriculum developers, teachers, educational support staff and environmental educators give specific meaning to biodiversity and help learners critically analyse the way biodiversity is used in science, technology and society.

The procedure was developed after a comprehensive study that explored the various meanings, values and uses associated with biodiversity. In addition the contexts in which biodiversity might be used as a theme for environmental learning were investigated as a prerequisite to making the theme relevant in people's everyday lives.

Chapter 2 begins by reflecting on environmental education and its meaning. The behaviourist approach to environmental education is questioned and the values of non-behaviourist approaches are highlighted. Environmental and science literacy and a rationale for learning about biodiversity are the focus of Chapter 3. Chapter 4 discusses the variety of definitions of biodiversity and provides guidelines on establishing learning goals, developing themes, contextualising biodiversity and valuing biodiversity. The book finishes with appendices that outline the research approach, questionnaires and a bibliography and a useful list of resources that focus on the topic of environmental education and biodiversity .

Environmental Interpretation Ham, Sam (1992) North American Press, Golden Colorado USA. ISBN 1-55591-902-2. Distributors - Acorn Naturalists, 17300 East Seventeenth Street, Suite J 236, Tustin, CA 92780 USA. Email: EmailAcorn@aol.com, Readers can also order this book through www.amazon.com.

▲ disponibles

biodiversité doit être utilisée comme un thème d'apprentissage à l'environnement ont été examinés en tant qu'une condition préalable pour adapter le thème à la vie d'aujourd'hui.

Le chapitre 2 s'ouvre par une réflexion sur l'éducation à l'environnement et sur sa signification. L'approche comportementale dans l'éducation à l'environnement est remise en question et les valeurs des approches non-comportementales sont soulignées. La littérature sur l'environnement et les sciences et un raisonnement pour des apprentissages sur l'environnement constituent le thème central du chapitre 3. Le chapitre 4 débat de la variété des définitions de la biodiversité et fournit des directives pour fixer des objectifs d'apprentissage, développer des thèmes, contextualiser la biodiversité et valoriser la biodiversité. Le livre se termine par des annexes qui explicitent l'approche par la recherche et fournissent des questionnaires, une bibliographie et une liste utile de références s'intéressant aux objectifs d'éducation à l'environnement et à la biodiversité.

Environmental Interpretation Ham, Sam (1992) North American Press, Golden Colorado USA. ISBN 1-55591-902-2. Distributors - Acorn Naturalists, 17300 East Seventeenth Street, Suite J 236, Tustin, CA 92780 USA. Email: EmailAcorn@aol.com, Les lecteurs peuvent aussi commander ce livre à www.amazon.com.
Sous-titre - *Un guide pratique pour ceux qui ont de grandes idées et de petits budgets* - ce livre est considéré comme la 'bible' de l'interprétation par de nombreux responsables de l'interprétation dans les jardins botaniques et les aires naturelles protégées. Bien que ce titre soit sorti de presse depuis plusieurs années, il reste une ressource de valeur qui continue à être pertinente et pratique. Le début du livre s'emploie à définir

● recursos

ser usada como tema para el aprendizaje ambiental fueron investigados como un prerequisito para hacer los tema relevante en la vida diaria de la gente.

El capítulo 2 comienza con una reflexión sobre la educación ambiental y su significado. La aproximación a la educación ambiental es cuestionada y los valores de las aproximaciones no ambientalistas son resaltadas. Ambientalismo y ciencia literaria y una justificación para el aprendizaje acerca de la biodiversidad son los enfoques del capítulo 3 y el capítulo 4, discute la variedad de definiciones para el aprendizaje acerca de la biodiversidad y provee los lineamientos para el establecimiento y los objetivos de aprendizaje, desarrollando temas, contextualizando la biodiversidad y valorando la biodiversidad.

El libro termina con apéndices que delinean la aproximación a la investigación y una bibliografia y una lista útil de recursos sobre el tema de educación ambiental y biodiversidad.

Interpretación Ambiental Ham, Sam (1992) North American Press, Golden Colorado USA. ISBN 1-55591-902-2. Distributors - Acorn Naturalists, 17300 East Seventeenth Street, Suite J 236, Tustin, CA 92780 USA. Email: EmailAcorn@aol.com, Los lectores puedan pedir este libro de www.amazon.com.
Subtitulado - *A Practical Guide for People with Big Ideas and Small Budgets (Una guía práctica para gente con grandes ideas y pequeños presupuestos)* – este libro es considerado la 'biblia' en interpretación por mucha gente que son responsables de la interpretación en jardines botánicos y en las areas naturales protegidas. A pesar de que ha sido lanzado hace unos pocos años, continua siendo importante y es todavía una fuente importante que continua siendo relevante y práctica.

■ resources

Subtitled - *A Practical Guide for People with Big Ideas and Small Budgets* – this book is considered the interpretive 'bible' by many people who are responsible for interpretation in botanic gardens and natural protected areas. Although it has been released for a few years it is still an important resource that continues to be relevant and practical. The book initially focuses on defining interpretation and the issues with communicating with non captive audiences. It also has several chapters that provide a practical step by step guide to preparing and presenting talks and guided tours, using visual aids, and developing inexpensive exhibits and some basic design principles. This book was first published in Spanish and the English version followed shortly afterwards. Case studies from North and South America illustrate how these ideas and concepts are put into practice and a guide to key organisations in interpretation and environmental education around the world are listed in the appendices.

Pachamama Our Earth, Our Future
United Nations Environment Program (1999) Evans Brothers Ltd.
ISBN 0 237 52119 9.

'Pachamama' is an Inca word which means more than Mother Earth, it suggests living in total harmony **with** the Earth and **not from** the Earth. The recent publication *Pachamama Our Earth, Our Future* is a follow on from the publication *Rescue Mission - Planet Earth*. It focuses on GEO-2000, the Global Environment Outlook report of the United Nations Environment Programme, and is a perfect introduction, written in a highly accessible way, to the environmental challenges that face us in the 21st Century. Twenty countries were requested to report on essential threats to the environment, economic development, population increase and patterns of production and consumption. The publication also draws on the contributions of young

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l'interprétation et les problèmes de communiquer avec une audience qui n'est pas obligée d'écouter. Il contient aussi plusieurs chapitres qui fournissent une démarche pratique 'pas-à-pas' pour préparer et présenter des exposés et des visites guidées, utiliser des aides visuelles, préparer des documents peu coûteux et appliquer certains principes de base pour la conception. Ce livre a d'abord été publié en espagnol et puis rapidement en Anglais. Des études de cas d'Amérique du Nord et du Sud illustrent comment ces idées et ces concepts sont mis en pratique et un guide des organisations de choix pour l'interprétation et l'éducation à l'environnement partout dans le monde est renseigné dans les annexes.

Pachamama Our Earth, Our Future
United Nations Environment Program (1999) Evans Brothers Ltd.
ISBN 0 237 52119 9.

'Pachamama' est un mot inca signifiant 'Terre mère', qui suggère de vivre en total harmonie **avec** la Terre et **non de** la Terre. La récente publication *Pachamama Our Earth, Our Future* est une suite de la publication *Rescue Mission - Planet Earth*. Ce livre est centré sur GEO-2000, le rapport 'Global Environment Outlook' (Perspectives pour l'environnement global) du Programme Environnement des Nations Unies. Il s'agit d'une introduction parfaite, dans un style très accessible, des enjeux de l'environnement qui nous attendent au 21ème siècle. Il a été demandé à 20 pays de fournir des informations sur les menaces majeures de l'environnement, le développement économique, l'augmentation de la population et les schémas de production et de consommation. La publication contient aussi les contributions personnelles de jeunes de partout dans le monde, du Pérou à Hong Kong, opinions, poèmes, illustrations de même qu'un jeux de table, en l'occurrence, un 'éco-labyrinthe'.

● recursos

El libro inicialmente se enfoca sobre la definición de interpretación y los temas de comunicación con audiencias no cautivas. También tiene varios capítulos que preveen una guía práctica paso a paso para preparar y presentar pláticas y tours guiados, usando ayuda visual, y desarrollando exhibidores no costosos y algunos principios de diseño básicos. Este libro fue publicado primero en español y luego en inglés seguido de cortos resumenes. Casos de estudio de América del Sur y del Norte ilustran como estas ideas y conceptos son puestos en práctica y una guía para organizaciones en interpretación y educación ambiental alrededor del mundo son enlistadas en los apéndices.

Pachanama, Nuestra Tierra, Nuestro Futuro
United Nations Environment Program (1999) Evans Brothers Ltd.
ISBN 0 237 52119 9.

'Pachamama' es una palabra Inca que significa mas que Madre Tierra, esta sugiere vivir en armonia **con** la Tierra y **no de** la Tierra. La reciente publicación *Pachamama Our Earth, Our Future* es seguida de la publicación *Rescue Mission - Planet Earth*. Ella se enfoca a GEO-2000, el reporte Una mirada al Ambiente Global, del Programa del Medio Ambiente de las Naciones Unidas, y es una introducción perfecta, escrita en forma altamente accesible, a los cambios ambientales que nos esperan en el siglo 21. Veinte paises fueron requeridos para reportar sobre las amenazas esenciales al medio ambiente, desarrollo económico, incremento de la población y patrones de producción y de consumo. La publicación también habla sobre las contribuciones de la gente joven alrededor del mundo a través de cuentas personales, poemas e ilustraciones desde Peru hasta Hong Kong, así también como incluyendo un complicado juego de laberinto ecológico.

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people from around the world through personal accounts, poems and illustrations from Peru to Hong Kong as well as including a fold-out eco-maze game.

Numeracy Through the Environment
National Association of Field Study Oficers (2000) CEES Stibbington Centre, Great North Road, Stibbington, Peterborough PE86 LP UK.
Email: rosie.edwards@education.camcnty.gov.uk

Numeracy Through The Environment has recently been launched and follows on from a similar resource book called Literacy Through the Environment. This resource is a compilation of ideas for incorporating numeracy into educational work in the environment. It draws on the experience of environmental centres across the UK and is a resource which is ideal to use for new ideas and approaches. These vary from the solid and accessible, such as devising maths trails, to the innovative and creative, such as using flowers to learn algebra, and is sure to have a long shelf life.

The Web of Life: A New Synthesis of Mind and Matter
Capra, Fritjof (1997) Harper Collins Publishers.
ISBN 000 654 7516.

Based on ten years of research and discussion with scientists from around the world, *The Web of Life* provides a foundation for ecological policies that allows us to build and sustain communities, without diminishing opportunities for future generations. Capra challenges conventional views of evolution and the organisation of living systems, steering us away from a mechanistic view of the world towards a holistic, ecological view. Whilst the ideas, models and theories discussed in the book are complex, the language is non-technical and aimed at the general reader. Capra has written and lectured extensively about the philosophical implications of

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Numeracy through the Environment est récemment sorti de presse et procède de la même idée qu'un livre ressource intitulé *Literacy Through the Environment*. Il s'agit d'une compilation d'idées pour incorporer les cours de mathématique dans les travaux d'éducation à l'environnement. Ce livre rapporte l'expérience de centres-environnement en Grande Bretagne et constitue une ressource idéale pour glaner de nouvelles approches et de nouvelles idées. Ces démarches peuvent être concrètes et accessibles, comme imaginer les traces laissées par des maths, ou novatrices et créatives, comme utiliser des fleurs pour apprendre l'algèbre. Certainement promu à une longue vie dans les rayonnages des bibliothèques.

The Web of Life: A New Synthesis of Mind and Matter
Capra, Fritjof (1997) Harper Collins Publishers.
ISBN 000 654 7516.

Basé sur 10 années de recherches et de discussions avec des scientifiques de toutes les régions du monde, *The Web of Life* fournit les bases pour une politique écologique qui nous permet de construire et de maintenir les communautés, sans réduire les chances des générations futures. Capra remet en question les vues habituelles de l'évolution et de l'organisation des systèmes vivants, nous conduisant d'une conception mécanique du monde à une approche globale et écologique. Alors que les idées, les modèles et les théories discutées dans cet ouvrage sont complexes, le langage se veut non-technique et s'adresse au lecteur courant. Capra a beaucoup écrit et enseigné sur les implications

● recursos

Numerando a Través del Medio Ambiente
National Association of Field Study Oficers (2000) CEES Stibbington Centre, Great North Road, Stibbington, Peterborough PE86 LP UK.
Email: rosie.edwards@education.camcnty.gov.uk

Numeracy Through The Environment ha sido recientemente lanzado y seguido de un libro similar llamado *Literacy Through the Environment*. Este recurso es una compilación de ideas para incorporar los números en el trabajo educativo que se realiza en el medio ambiente. Este, ilustra sobre la experiencia de centros ambientales a traves del Reino Unido y es una fuente ideal para usarse en nuevas ideas y aproximaciones. Estas varian de lo sólido y accesible, tal como la revisión de los caminos de las matemáticas, hasta la innovación y la creatividad, tal como el uso de las flores en el aprendizaje del álgebra, y es seguro que tendrá una larga vida en los libreros.

El WEB de la Vida: Una Nueva Síntesis de Pensamiento y Materia
Capra, Fritjof (1997) Harper Collins Publishers.
ISBN 000 654 7516.

Basado en 10 años de investigación y discusión con científicos de alrededor del mundo. *The Web of Life* provee el fundamento para el establecimiento de políticas ecológicas que permitan a todos nosotros construir y sostener comunidades, sin disminución de oportunidades para las generaciones futuras. Capra desafía la visión convencional de la evolución y la organización de los sistemas vivientes, direccionándonos lejos de una visión mecanística derivada de una visión mecanística del mundo hacia una visión holística y ecológica. Mientras las ideas, modelos y teorías discutidas en el libro son complejas, el lenguaje es no-técnico y clama al lector general. Capra ha escrito y leído extensivamente acerca de las implicaciones filosóficas de la ciencia moderna y actualmente es el Director

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modern science and is currently the Director of the Center for Ecoliteracy in Berkeley, California, USA. *The Web of Life* is an accessible and profound book that will provide a rationale for botanic gardens wanting to develop a strategy for education for sustainability.

Anthology for the Earth
Allen, Judy (ed) (1997) Walker Books Ltd.
ISBN 0744 544 386.
Judy Allen is an award winning writer of natural history and conservation books for children. As a young girl, she compiled a notebook of extracts and poems about the natural world that inspired her. These writings together with her more recent discoveries form the basis of this rich anthology. Many of the writings exclaim how complex and beautiful the world is, others express pain and rage at the needless damage we've inflicted upon it, while others show that it doesn't have to be like this. The voices are of poets, scientists, spiritual leaders and ordinary people. What links these pieces is a passionate concern for the earth - evident also in the amazing paintings, drawings and photographs that accompany them. *Anthology for the Earth* is a book to stir the emotions and one which will delight children and adults alike.

Botanical Models
Marcus Sommer, Somso Modelle Friedrich-Rueckert-Strase 54, D-9645 Coberg Germany. P.O. Box 2942, D-96418 Coberg Germany.
Tel / Fax (49) 9561 857411 or Adam Rouilly Ltd. Crown Quay Lane Sittingbourn Kent ME10 3JG UK.
Tel: (44) 1795 471378
Fax: (44) 1795 479787.
How do you demonstrate flower dissection to a whole class or look at a complete fungal life cycle? The beautiful large scale models from Marcus Sommer, Somso modelle, makes demonstrating flower structures easy, and relating the form of plants or flowers to function far

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philosophiques de la science moderne et est actuellement directeur du Center for Ecoliteracy de Berkeley (Californie, USA). *The Web of Life* est un livre accessible et profond qui fournira des arguments aux jardins botaniques qui désirent développer une stratégie d'éducation à la 'durabilité'.

Anthology for the Earth
Allen, Judy (ed) (1997) Walker Books Ltd. ISBN 0744 544 386
Judy Allen a été récompensée en tant qu'auteur de livres d'histoire naturelle et de conservation de la nature à destination des enfants. Jeune fille, elle rédigeait un carnet d'extraits et de poèmes sur la nature qui l'inspirait. Ces écrits et ses plus récentes découvertes constituent la base de cette riche anthologie. Parmi les textes, nombreux clament la complexité et la beauté du monde, d'autres expriment la douleur et la rage contre les dommages gratuits que nous lui faisons subir, et d'autres encore montrent qu'il ne doit pas en être ainsi. Tour à tour, ce sont des poètes, des scientifiques, des guides spirituels ou des gens ordinaires qui s'expriment. C'est une préoccupation passionnée pour la Terre qui lie les textes - préoccupation évidente que l'on retrouve aussi dans les étonnantes peintures, illustrations et photographies qui les accompagnent. *Anthology for the Earth* est un livre émouvant qui ravira aussi bien les enfants que les adultes.

Botanical Models
Marcus Sommer, Somso Modelle Friedrich-Rueckert-Strase 54, D-9645 Coberg Germany. P.O. Box 2942, D-96418 Coberg Germany.
Tel / Fax (49) 9561 857411 or Adam Rouilly Ltd. Crown Quay Lane Sittingbourn Kent ME10 3JG UK.
Tel: (44) 1795 471378
Fax: (44) 1795 479787.
Comment réaliser la dissection d'une fleur pour toute une classe ou comment examiner le cycle complet de la vie des champignons? Les splendides maquettes de grande taille de Marcus Sommers, *Somso modelle*,

● recursos

del Centro para Ecoliteratura en Berkeley, California, USA. *The Web of Life* es un libro accesible y profundo que proveerá una justificación para los jardines botánicos que quieren desarrollar una estrategia para educación para sustentabilidad.

Antología Para la Tierra
Allen, Judy (ed) (1997) Walker Books Ltd.
ISBN 0744 544 386.
Judy Allen es una escritora de historia natural y libros de conservación para niños, premiada y ganadora. Cuando era una muchacha joven, ella compiló un cuaderno de extractos y poemas acerca del mundo natural que la inspiró. Estos escritos junto con sus mas recientes descubrimientos forman las bases de su rica antología. Muchos de sus escritos claman cuán complejo y hermoso el mundo es, otros expresan dolor y hacen referencia al daño innecesario que nosotros hemos causado sobre él, mientras otros muestran que éste no tiene que ser como es. Las voces son de poetas, científicos, líderes espirituales y de gente común. Lo que liga estas partes es una preocupación apasionada por la tierra - también evidente en las pinturas espectaculares, dibujos y fotografías que los acompañan. *Anthology for the Earth* es un libro para agitar las emociones y uno que deleitará a los niños y a los adultos indistintamente.

Modelos Botánicos
Marcus Sommer, Somso Modelle Friedrich-Rueckert-Strase 54, D-9645 Coberg Germany. P.O. Box 2942, D-96418 Coberg Germany.
Tel / Fax (49) 9561 857411 or Adam Rouilly Ltd. Crown Quay Lane Sittingbourn Kent ME10 3JG UK.
Tel: (44) 1795 471378
Fax: (44) 1795 479787.
Cómo demostrarías tu una disección de una flor a un grupo completo o mirarías el ciclo de vida completo de los hongos? Los hermosos modelos a escala de Marcus Sommer, *Somso modelle*, hace la demostración de la

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simpler to understand. At the Royal Botanic Garden Edinburgh the models have been used with classes for the past 6 years and have stood up well to the use. Although not cheap (£125-£350) the models are good value for money.

ELECTRONIC RESOURCES

http://botanic.org/
This is the web site of the Cheyenne Botanic Garden. Cheyenne practices sustainability daily and provides for the sustainability of its plants, volunteers and the community. Over 90% of labor used in the garden is provided by seniors, youth and volunteers from the disability community. The garden's conservatory is 100% solar heated and 30% of their electricity is also powered by the sun! The web site describes in detail how their sustainable practices are accomplished and will be of great interest to those people who work in gardens that are trying to incorporate 'green' housekeeping policies and practices.

http://susdev.eurofound.ie
A new sustainable development website facility has been launched by the European Foundation for the Improvement of Living and Working Conditions (a nonprofit autonomous agency of the European Commission). The foundation's website, which is in French and English, includes an extensive 'links' listing of organisations who are pioneering sustainable development.

The Sustainable Development homepage has been specifically designed to support the needs of the social partners at all levels in their activities to promote sustainable development from a practical company level to a policy level. The resources here may also assist public policy makers and non-governmental organisations working in the area. In addition to providing information about the Foundation's past and current research in the area, a special

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facilitent les démonstrations sur la structure des fleurs et simplifient la mise en évidence des relations entre les formes des plantes ou des fleurs et leurs fonctions. Les maquettes ont été utilisées au Jardin botanique royal d'Edinburg avec des classes pendant les 6 dernières années et ont bien supporté le traitement. Bien que coûteuses (de 125 £ à 350 £) ces maquettes valent bien leur argent.

RESSOURCES ELECTRONIQUES

http://botanic.org/
C'est le site web du Cheyenne Botanic Garden. Ce jardin botanique met en pratique journellement des méthodes 'durables' et utilise des volontaires et la communauté pour l'entretien de ses plantes. Plus de 90 % du travail dans le jardin est produit par des seniors, des jeunes et des personnes handicapées. La serre est chauffée à 100 % par l'énergie solaire tandis que 30 % de l'électricité est aussi d'origine solaire! Le site web décrit en détail les méthodes mises en œuvre et se révélera d'un grand intérêt pour ceux qui travaillant dans les jardins botaniques essayent d'inclure des procédures et des méthodes d'entretien 'vertes'.

http://susdev.eurofound.ie
Un nouveau site web sur le développement durable vient d'être lancé par la Fondation européenne pour l'amélioration des conditions de vie et de travail (une agence autonome sans but lucratif de la Commission Européenne). Le site de la Fondation, réalisé en français et en anglais, présente une importante liste de lien vers des organisations qui s'intéressent depuis longtemps au développement durable.

La page d'accueil 'Développement Durable' a été spécifiquement conçue en fonction des besoins des partenaires sociaux, quelque soit le niveau de leurs activités, pour promouvoir le développement durable, depuis le niveau d'une société de service jusqu'au niveau de la

● recursos

estructura de las flores fácil y relaciona la forma de plantas o flores a su función simple de entender fáciles de entender. En el Royal Botanic Garden Edinburgh los modelos han sido usados en clases durante los 6 años pasados y han probado resistir al uso. A pesar de que no son baratos (£125-£350) los modelos bien valen su precio.

RECURSOS EELECTRONICOS

http://botanic.org/
Este es el sitio web del Cheyenne Botanic Garden. Cheyenne practica sustentabilidad diariamente y se encarga de la sustentabilidad de sus plantas, voluntarios y de la comunidad. Mas del 90% de trabajo realizado en el jardín es provisto por señores, jóvenes y voluntarios de la comunidad de discapacitados. El conservatorio del jardín es calentado 100% con energía solar y 30% de su electricidad es también proporcionada por el sol. El sitio web describe en detalle como sus prácticas son acompletadas y será de gran interés a aquella gente quienes trabajan en jardínes que están tratando de incorporar políticas y prácticas 'verdes' en el mantenimiento de la casa.

http://susdev.eurofound.ie
Un nuevo sitio web de desarrollo sustentable ha sido lanzado por la Fundación Europea para el mejoramiento de las condiciones de Vida y de trabajo (una agencia autónoma sin fines de lucro de la Comisión Europea). El sitio web de la Fundación, el cuál está en Francés e Inglés, incluye unos 'enlaces' extensivos listando organizaciones pioneras del desarrollo sustentable.

La página del desarrollo sustentable ha sido especificamente diseñada para apoyar las necesidades de la comunidad social en todos los niveles de sus actividades, para promover el desarrollo de un nivel práctico a un nivel de política. Los recursos aquí pueden también asistir a los hacedores públicos de políticas y a las

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additional feature of the sustainable development pages are its databases which explore specific facets of the sustainability debate and take advantage of the foundation's research in a variety of areas. The Networks' database provides links to, and information about, the growing number of network-orientated organisations working in the field of sustainable development not only in Europe but around the world.

Other resources include a Conferences' directory (which provides a listing of conferences on sustainable development topics), a Tools database (with links to the growing number of practical sustainable development resources and software tools available on the internet) and an Education and Training database (with a register and search facility covering vocational education and training courses in the European Union and Norway on sustainable development).

www.worldbank.org/
The web site for the World Bank has a range of information that could be useful to botanic garden educators. The site provides access to the organisation's newsletters that address poverty and development issues. In addition, there are links to museums and libraries around the globe. The World Bank has a development education programme and there are teaching modules addressing social, economic and environmental issues on line. Development data is also available for countries throughout the world and trends in social and economic development in the last three decades are available. The training material is available in English, French and Spanish and the site also has a free translation service which can be downloaded enabling you to translate text from English into French, German, Italian, Portugese and Spanish.

www.eelink.umich.edu/eex.html
This web site provides a link to environmental education resources on

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réglementation. Ici, les ressources devraient pouvoir aider les acteurs publics auteurs des réglementations et les organisations non-gouvernementales. De plus, en fournissant des informations sur le passé de la Fondation et sur les travaux actuels, un aspect spécial des pages sur le développement durable est la présentation d'une base de données qui explore des facettes spécifiques du débat sur le développement durable et qui tire parti de la variété des travaux réalisés par la Fondation. La Base de Données des Réseaux fournit des liens et des informations sur le nombre croissant d'organisations à orientation 'réseau', travaillant dans le développement durable, pas seulement en Europe, mais partout dans le monde.

Parmi les autres ressources, un Annuaire des Conférences (fournissant une liste des conférences sur le développement durable), une Base de Données d'Outils (avec des liens vers le nombre croissant de ressources pratiques sur le développement durable et les logiciels disponibles sur l'internet), et une Base de Données sur l'Education et la Formation (avec un registre et un outil de recherche couvrant les cours à vocation d'éducation et de formation dans l'Union européenne et en Norvège sur le développement durable).

www.worldbank.org/
Le site web de la Banque Mondiale présente une gamme d'informations qui peuvent se révéler utiles pour les jardins botaniques. Le site permet d'accéder aux bulletins d'information de l'organisation qui ont trait aux enjeux sur la pauvreté et le développement. De plus, il y a des liens vers les musées et les bibliothèques du monde. La Banque Mondiale a un programme d'éducation de développement et il y a des modules d'apprentissage en ligne sur les enjeux sociaux, économiques et environnementaux. Des données sur le développement sont aussi disponibles pour tous les pays du monde, ainsi que des tendances dans le

● recursos

organizaciones no-gubernamentales que trabajan en el área. Además de proveer información acerca de las investigaciones pasadas y actuales de la Fundación en el área, una característica especial adicional de las páginas de desarrollo sustentable lo constituyen sus bases de datos, las cuáles exploran las facetas específicas del debate de sustentabilidad y toman ventaja de las investigaciones de la Fundación en varias áreas. La red de bases de datos proveen ligas a, e información acerca, del creciente número de organizaciones en red trabajando en el campo del desarrollo sustentable no solamente en Europa sino también alrededor del mundo.

Otros recursos incluyen un directorio de Conferencias (el cuál proporciona una lista de conferencias sobre temas de desarrollo sustentable), una base de datos Tools (la cuál liga al número creciente de recursos prácticos del desarrollo sustentable y herramientas de software disponible en internet) y una base de datos de Educación y Capacitación 'con un registro y facilidades de búsqueda cubriendo educación vocacional y cursos de capacitación sobre desarrollo sustentable en la unión Europea y Noruega'.

www.worldbank.org/
El sitio web del Banco Mundial tiene un rango de información que podrí ser útil a los educadores de los Jardínes botánicos. El sitio provee acceso a los boletínes de organización que contienen temas de pobreza y desarrollo. Además, hay ligas a museos y librerias alrededor del mundo. El Banco Mundial tiene un programa de educación y hay módulos de enseñanza conteniendo temas sociales, económicos y medioambientales en línea. El desarrollo de datos también está disponible para otros países del mundo y las tendencias sociales y de desarrollo económico durante las últimas tres décadas también están disponibles. El material de entrenamiento esta disponible en

■ resources

the internet. Under key categories including environmental information, classroom resources, professional resources and organisations and projects, web searchers can link to other key sites on the internet. These key categories link web users to a range of interesting sites for example: 'professional resources' provides links to publications, professional development opportunities and communities; 'classroom resources' provides links to find materials, activities and programmes for K-12 classes and the 'organisation' and projects' category links to state, regional and international sites as well as those that address current topics. This site is a North American Asssociation for Environmental Education project.

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développement social et économique pour les 3 dernières décades. Le matériel de formation est disponible en anglais, français et espagnol et le site bénéficie d'un service de traduction gratuit qui peut être téléchargé et qui permet de traduire les textes de l'anglais vers le français, l'allemand, l'italien, le portugais et l'espagnol.

www.eelink.umich.edu/eex.html
Ce site web fournit un lien vers des ressources d'éducation à l'environnement. A l'aide de catégorie clés, incluant informations sur l'environnement, ressources pour les classes, ressources professionnelles, organisations et projets, la personne à la recherche d'informations sur l'internet peut joindre d'autres sites clés. Ces catégories clés lient les utilisateurs à des sites d'un large intérêt, par exemple: ressources professionnelles fournit des liens vers des publications, des possibilités et des communautés de développement professionnel; ressources pour les classes renseigne des liens pour trouver du matériel, des activités, des programmes pour les classes 'K-12'; la catégorie organisations et projets envoie vers des sites de pays, de régions ou internationaux, ainsi que vers des sites dédiés au domaine. Ce site est un projet de l'Association nord-américaine pour l'éducation à l'environnement (North American Association for Environmental Education).

● recursos

Inglés, Francés y Español y el sitio también tiene un servicio de traducción gratuito el cuál puede ser bajado y permite traducir textos del Inglés al Francés, Alemán, Italiano, Portugués y Español.

www.eelink.umich.edu/eex.html
Este sitio web provee un enlace a los recursos de educación ambiental en internet. Bajo categorías claves incluyendo información medioambiental, recursos didácticos, recursos profesionales y organización y proyectos, buscadores de webs pueden ligar a otros sitios clave sobre el internet. Estas categorías claves ligan usuarios del web a una variedad de sitios interesantes, por ejemplo: recursos profesionales proveen enlaces a publicaciones, oportunidades de desarrollo profesional y comunidades; recursos didácticos proveen ligas para encontrar materiales, actividades y programas para clases K-12 y la organización y categoría de proyectos ligan al estado, sitios regionales e internacionales asi también como a aquellos que manejan tópicos actuales. Este sitio es un proyecto de la Asociación Norteamericana de Educación ambiental.

Botanic Gardens Conservation International

Membership Application Form

Established in 1987, BGCI works with botanic gardens and the wider conservation community in support of plant conservation around the world. Advocacy, capacity building, networking, sharing information, training and education are all key activities in pursuit of this goal. We currently have over 500 member institutions in 110 countries, working together to implement the new *International Agenda for Botanic Gardens*.

Garden members receive our regular publications *BGCNews (Botanic Gardens Conservation News)* and *Roots* (Education Review) and a wide range of other publications, materials and services, such as *The Darwin Technical Manual for Botanic Gardens* and *BG-Recorder 2*, a computer software package for plant records. Corporate members receive *BGCNews* and *Roots*, have access to wider partnerships, advice on conservation issues and opportunities for collaboration in key projects. Associate members and Conservation donors receive *BGCNews* and *Roots*, while Individual members have a choice of *BGCNews* or *Roots*. Members are invited to *The International Botanic Gardens Conservation Congress* and *The International Congress on Education in Botanic Gardens*, held every three years.

If you support the mission of BGCI and would like to belong to this world network for plant conservation and sustainable living, please join BGCI using this form. With your support, we can make a difference.

BGCI Membership Category	£ Sterling	US Dollars	Euros
BGCI Patron garden	5000	7500	7000
Garden member (budget more than US$ 2,250,000)	600	940	940
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Garden member (budget below US$ 750,000)	160	220	220
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