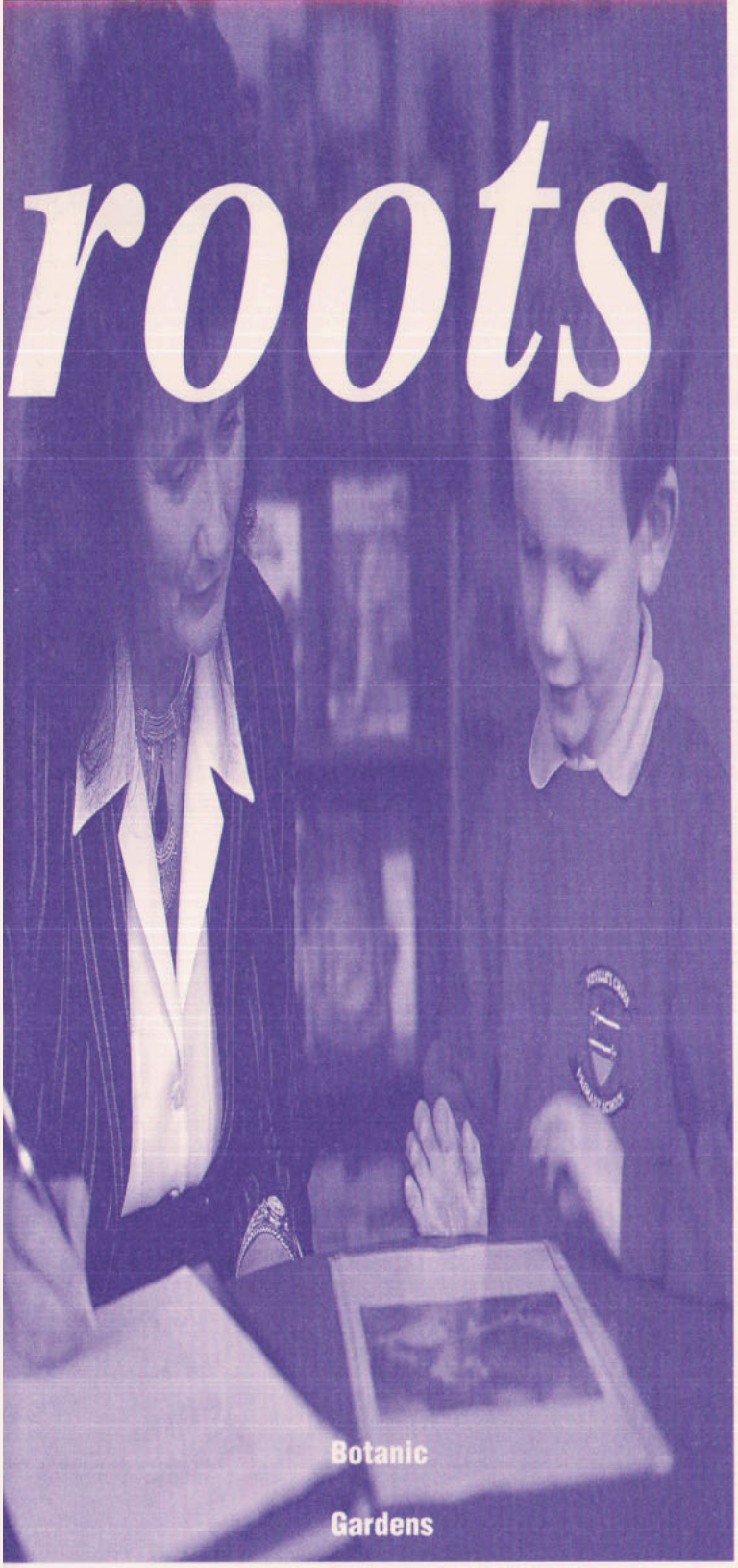


roots

Botanic Gardens Conservation International Education Review

BOTANIC GARDENS

Education for Conservation

- Why Conduct Research in Environmental Education?
- Special Places for Young Children
- School in the Forest - India
- Evaluation and Research: the Key to Support
- Focus on Networks - Australia

BGCI 10th Anniversary

i5

December 1997

Environmental Education Research

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.

forthcoming issues

Roots 16 - Focus on Africa - Last submission dates: Articles - February 28, 1998, News - March 15, 1998
Roots 17 - Education for Sustainability - Last submission dates: Articles - August 1, 1998, News - September 1, 1998

2

Practice and theory an intimate link

■ editorial

The jury is still out on what constitutes Environmental Education (EE) and how it should be delivered. This is not surprising, given that EE is still a relatively new discipline. But the question of identity is an urgent one. Giving substance to our thinking in EE is essential for developing the effectiveness of EE programmes in botanic gardens and for attracting funding and other resources.

While there is a strong and growing body of EE research, little of this is being undertaken in botanic gardens. However, there are encouraging signs that at last, the deficit is gradually being addressed.

The old fault lines separating quantitative, positivist research and qualitative, interpretative research are still visible in EE as anywhere else, as articles in this issue from both sides of the ideological divide clearly show. Nevertheless, whatever one's ideological perspectives may be, it must surely be possible to find common ground on the primacy of botanic gardens as centres of learning, for raising awareness about environmental issues and changing attitudes and behaviours.

By encouraging educators to question their own programmes - and even to

▲ éditorial

L'idée d'Education à l'Environnement (EE) est encore floue sur ce qui la constitue et sur la façon de la dispenser. Ce n'est pas surprenant, étant donné que l'EE est encore une discipline relativement jeune. Mais il est urgent d'étudier la question de l'identité. Donner de la substance à notre pensée sur l'EE est indispensable pour développer des programmes efficaces dans les jardins botaniques et pour obtenir des subventions et autres ressources.

Alors qu'il existe un corpus de recherches en EE de haut niveau et en expansion, peu d'entre elles sont entreprises dans les jardins botaniques. Quoi qu'il en soit, il y a des signes encourageants montrant qu'enfin, ce déficit est peu à peu pris en compte.

L'ancien fossé séparant la recherche quantitative et positiviste de la recherche qualitative et interprétative est encore visible en EE comme partout ailleurs, comme les articles de ce numéro, émanant des deux tendances idéologiques, le montrent clairement. Néanmoins, quelques puissent être nos perspectives idéologiques, il doit sûrement être possible de trouver un terrain d'entente sur la primauté des jardins botaniques comme centres d'apprentissage, pour

● editorial

El jurado está aún fuera de lo que constituye la Educación Medioambiental (EM), y como debería tratarse. No es sorprendente, dado que la EM es aún una disciplina relativamente reciente. Pero la cuestión de identidad es urgente. Nuestro pensamiento en la EM es esencial para desarrollar la efectividad de los programas de EM en jardines botánicos y para atraer fondos y otros recursos.

Existe un fuerte y creciente grupo de investigadores de EM, pero son pocos los que desarrollan su actividad en jardines botánicos. Sin embargo, hay signos alentadores de que por fín este déficit está siendo gradualmente corregido.

Las antiguas lineas que separan la investigación cuantitativa, positivista de la investigación cualitativa e interpretativa son aún visibles en la EM como en cualquier otra parte, ambos puntos de vista ideológicos aparecen en algunos artículos de este número. Sin embargo, cualquiera de las perspectivas ideológicas puede ser, debería encontrarse un terreno común en la primacía de los jardines botánicos como centros de aprendizaje, para aumentar la conciencia sobre las cuestiones medioambientales y cambiar las

■ editorial

embark on their own EE research - we believe that botanic gardens would be well placed to help shape the nature of the debate rather than trail along behind. Practice and theory, after all, are intimately linked: practice helps improve theory and theory in turn helps shape practice.

▲ éditorial

une meilleure prise de conscience des questions d'environnement et pour changer les attitudes et comportements.

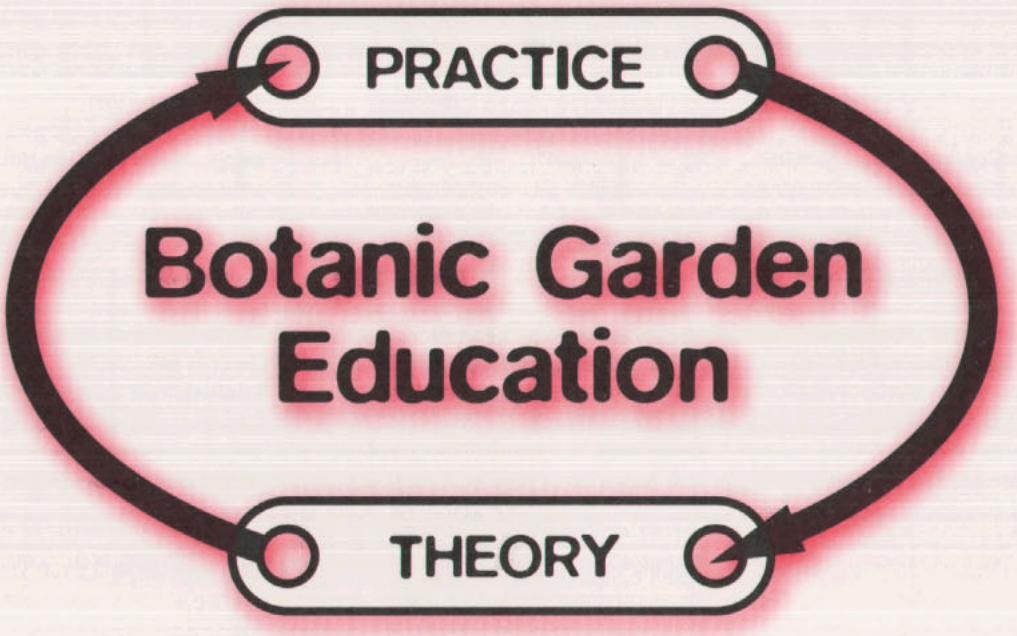
En encourageant les éducateurs à analyser leurs propres programmes - et même à s'engager dans leur propre recherche - nous pensons que les jardins botaniques seraient bien placés pour aider les débats à prendre forme plutôt que de rester à la traîne. Pratique et théorie, après tout, sont intimement liés: la pratique aide à améliorer la théorie et la théorie en retour aide la pratique à prendre forme.

● editorial

aptitudes y comportamientos.

Alentando a los educadores a preguntarse sobre sus propios programas - e incluso embarcarse en su propia investigación EM - creemos que los jardines botánicos estarían bien colocados para ayudar a formar la razón de este debate antes que quedarse a la zaga. Práctica y teoría, después de todo, estan íntimamente ligadas: la práctica ayuda a mejorar la teoría y la teoría sucesivamente ayuda a formar la práctica.

Julia Willison
BGCI



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news up date

■ news

Exhibitions for China

BGCI is currently working to produce four identical exhibitions for China, sponsored by the British Council. The exhibitions aim to raise young people's awareness of their responsibility towards the environment. Four botanic gardens - Shanghai, Beijing, Nanjing and Shenzhen - will host the exhibitions, which are due to be inaugurated in April 1998.

Conservation Congress

'Plants, People and Planet Earth - the role of botanic gardens in sustainable living' is the title of the Fifth International Botanic Gardens Conservation Congress to be held in Kirstenbosch, Cape Town, South Africa from 14-18 September 1998.

The education sessions of the congress will consider the implications of major international documents (Convention on Biological Diversity, Convention on International Trade in Endangered Species of wild fauna and flora (CITES) and Agenda 21) on botanic garden education programmes, and highlight exemplary programmes addressing these documents. Focus groups will be organised to discuss the relevance of Education for Sustainability to botanic gardens.

For more information and to register a place at the Congress contact: Professor Brian J Huntley, National Botanical Institute, Private Bag X7, Claremont 7735, South Africa. Tel: (27) 21 762 1166. Fax: (27) 21 761 4687. Email: bgci98@nbict.nbi.ac.za.

EE course for African Botanic Gardens

Following the Fifth International Botanic Gardens Conservation Congress, NBI and BGCI are organising

▲ nouvelles

Expositions pour la Chine

Le BGCI est actuellement en train de constituer 4 expositions identiques pour la Chine en partenariat avec le British Council. Ces expositions ont pour but de faire prendre conscience à la jeunesse de sa responsabilité vis à-vis de l'environnement. Quatre Jardins Botaniques Shanghai, Pékin, Nankin et Shenzhen abriteront ces expositions qui seront inaugurées en avril 1998.

Congrès sur la conservation

Congrés sur la conservation "Plantes, Peuples et planète - Le rôle des Jardins Botaniques dans le développement"
Tel est le titre du 5éme congrès international des Jardins Botaniques pour la conservation que se tiendra à Kirstenbosch, Au Cap, Afrique du Sud du 14 au 18 septembre 1998. Les réunions sur l'éducation prendront en compte l'impact des principaux textes internationaux (Convention sur la diversité biologique, Convention sur le commerce international des espèces menacées de la flore et de la faune sauvage (CITES) et agenda 21), dans les programmes des Jardins Botaniques. Pour plus des renseignements et pour réserver une place au congrès contacter: Le Professeur Brian J Huntley, National Botanical Institute, Private Bag X7, Claremont 7735 South Africa. Tel: (27) 21 762 1166. Fax: (27) 21 761 4687. Email: bgci98@nbict.nbi.ac.za

Cours d'éducation à l'environnement pour les Jardins Botaniques Africains

A la suite du 5ème congrès international des Jardins Botaniques pour la conservation, NBI et le BGCI organisent durant 5 jours un cours d'éducation à l'environnement pour les

● noticias

Exposiciones para China

BGCI está trabajando actualmente en la producción de 4 exposiciones idénticas para China, financiadas por el Consejo Británico. Las exposiciones tienen como objetivo concienciar a los jóvenes en la responsabilidad de la conservación del medio ambiente. Cuatro Jardines Botánicos - Shangai, Beijing, Nanjing y Shenzen- acogerán estas exposiciones que serán inauguradas en Abril de 1998.

Congreso sobre Conservación

'Plantas, Gente y Planeta Tierra' - el papel de los Jardines Botánicos en la vida sostenible, es el título del 5º Congreso Internacional de Conservación en Jardines Botánicos, que se celebrará en Kirstenbosch, Ciudad del Cabo, Sudáfrica del 14 al 18 de Septiembre de 1998.

Las sesiones de educación del Congreso tendrán en cuenta las implicaciones de los documentos maestros internacionales (Convención sobre Biodiversidad, Convención sobre Comercio Internacional y Especies Amenazadas de Fauna y Flora (CITES) y la Agenda 21) sobre los programas de educación de los jardines botánicos y los programas ejemplares dirigidos a estos documentos. Se organizarán grupos determinados para discutir sobre la educación para la conservación en Jardines Botánicos.

Para mayor información y solicitar reservas para el Congreso contactar con: Professor Brian J Huntley, National Botanical Institute, Private Bag X7, Claremont 7735, South Africa. Tel: (27) 21 762 1166. Fax: (27) 21 761 4687. Email: bgci98@nbict.nbi.ac.za.

news

a five day environmental education training course for staff working in African botanic gardens sponsored by the British Council. The course, which will run from 21-25 September 1998, aims to encourage and enhance the development of environmental education programmes in African botanic gardens. The subjects covered will include: environmental education (EE) theory, the role of EE in addressing international conservation policies, developing EE programmes, interpretation, community participation, resource material development and production. During the week, students will each complete and present a project. For more information contact: Ally Ashwell, Head of Education (Southern Gardens) NBI, see address above or Julia Willison, BGCI.

Education Congress in India

A flyer is enclosed with this issue of Roots for you to register your interest for the Fourth BGCI International Congress on Education in Botanic Gardens. The title of the Congress is 'The Power For Change: Botanic Gardens as Centres of Excellence in Education for Sustainability' The four major themes of the programme are: Rural and Community Outreach; New Trends in Science Education; Medicinal Plants and Ethnobotany - teaching our traditions; and Development Education and Environmental Ethics. People interested in presenting a workshop, paper or poster should request guidelines from BGCI.

Caribbean workshop

The second of three Caribbean botanic garden workshops was held in Barbados in July 1997. Hosted and organised by the Andromeda Botanic Garden and BGCI, the workshop attracted 30

nouvelles

équipes travaillant dans les Jardins Botaniques Africains. Le cours qui se déroulera du 21 au 25 septembre 1998, a pour but d'encourager et de mettre en valeur des programmes d'éducation au développement et à l'environnement dans les Jardins Botaniques Africains. Les sujets abordés incluront: La théorie de l'éducation à l'environnement, le rôle de l'éducation à l'environnement dans les politiques internationales concernant la conservation, le développement de programmes d'éducation environnementale, l'interprétation, la participation communautaire, la ressource utilitaire et la producation. Durant la semaine les étudiants devront chacun ressource utilitaire et la production. Durant la semaine les étudiants devront chacun elaborer et présenter un project. Pour plus d'informations contacter: Ally Ashwell, (voir adresse plus haut) or Julia Willison, BGCI.

Le prochain congrès sur l'éducation en Inde

Une fiche séparée est incluse dans ce numéro de Roots pour une première demande d'information concernant le 4ème congrès international du BGCI pour l'éducation dans les Jardins Botaniques. Le titre du congrès est "Le potentiel d'innovation: Les Jardins Botaniques en tant qu'institutions incontournables pour l'éducation pour l'utilisation raisonnée des ressources". Les quatre principaux thèmes sont: l'influence du milieu rural et de ses communautés; les nouvelles tendances dans les sciences de l'éducation; les plantes médicinales et l'ethnobotanique, la transmission du savoir; l'éducation au développement et l'éthique environnementale. Les personnes intéressées par la présentation d'un atelier, d'une communication ou d'un poster doivent demander des instructions au BGCI.

Atelier CARAIBES

Le second des trois ateliers concernant les Jardins Botaniques des CARAIBES s'est tenu à la Barbade en juillet 1997. Organisé dans ses murs par le Jardin Botanique Andromède et par le BGCI, cet atelier a attiré 30 participants de 15 îles.

noticias

Curso de Educación Ambiental (EA) para Jardines Botánicos Africanos

En fechas posteriores al 5º Congreso Internacional de Conservación en Jardines Botánicos, NBI y BGCI se organizará un curso práctico de 5 días sobre educación medioambiental para personal de Jardines Botánicos africanos. El curso que tendrá lugar del 21 al 25 de Septiembre de 1998, tiene como objetivo fomentar y mejorar el desarrollo de los programas de educación ambiental en los Jardines Botánicos Africanos. Los temas a tratar incluirán: teoría de la educación ambiental (EA), el papel de la EA con respecto a la política internacional de conservación y el desarrollo , interpretación, participación de la comunidad, desarrollo de material de recursos, y producción de los programas de Educación Ambiental. Durante esta semana los estudiantes realizarán y presentarán un proyecto. Para más información, contactar con: Ally Ashwell, Head of Education (Southern Gardens) NBI, ver dirección arriba o Julia Willison, BGCI.

Congreso de Educación en la India

En esta edición de Roots incluimos un formulario para inscribirse en el Cuarto Congreso Internacional de Educación en Jardines Botánicos. El título de este Congreso es "El Poder para el Cambio: Los Jardines Botánicos como Centros por Excelencia para la Educación para la Sostenibilidad". Los cuatro temas principales del programa son: Las Comunidades Rurales; Nuevas tendencias en la Educación de la Ciencia; Plantas Medicinales y Etnobotánica - enseñar nuestras tradiciones; y Desarrollo de Eticas Educativas y Ambientales. Las personas interesadas en presentar un taller, ponencia o poster deberán rellenar y enviar el impreso a BGCI.

Taller Caribeño

El segundo de los tres talleres Caribeños en jardines botánicos, se celebró en Junio de 1997 en Barbados. Al taller, financiado y organizado por el Jardín Botánico

■ news

participants from 15 islands.The first part of the workshop was spent discussing the Caribbean Islands Action Plan for Botanic Gardens. A final draft has now been sent to all Caribbean botanic gardens for comment. The second part of the workshop focused on environmental education in botanic gardens. Dr Joyce Glasgow, formerly a lecturer at the University of the West Indies, presented a keynote speech on environmental education provision in the Caribbean. This was followed by three shorter presentations by: Ms Edelmira Linares, UNAM Botanic Garden, Mexico (affecting public policy), Dr Angela Leiva, National Botanic Garden, Cuba (public education) and Dr Carolann Baldyga, Fairchild Tropical Botanic Garden, USA (staff training). The workshop finished with a discussion on aspects concerning the development of environmental education programmes in Caribbean botanic gardens.

European Botanic Garden Action Plan

Following on from the first European Botanic Garden Conference (Eurogard) held at the Royal Botanic Gardens, Edinburgh in April 1997, a draft education chapter has been prepared for inclusion in the European Botanic Garden Action Plan. The chapter has been circulated to all members of the education working group at the conference. Once their comments have been received, the chapter will be circulated to all European botanic gardens. The European Botanic Gardens Consortium intend to publish the Action Plan in 1998.

EC to fund Moroccan and Tunisian gardens

BGCI and Flora and Fauna International (FFI) have been awarded a grant by the European Commission to support biodiversity conservation in Morocco and Tunisia by developing the capacity of botanic gardens for national and international plant conservation and environmental education. The gardens involved are the Institut Agronomique et Vétérinaire Hassan II, Rabat, Morocco and the

▲ nouvelles

La première partie de l'atelier a été consacrée à l'élaboration du plan d'action pour les Jardins Botaniques des îles CARAIBES. Un compte rendu a été envoyé à tous les Jardins Botaniques des îles CARAIBES pour commentaire. La seconde partie de l'atelier s'est focalisée sur l'éducation à l'environnement dans les Jardins Botaniques. Le Docteur Joyce Glasgow, autrefois maître de conférences à l'Université des Indes Occidentales, a présenté une communication sur les mesures à prendre en matière d'éducation environnementale dans les CARAIBES. Ceci a été suivi par trois courts exposés de Madame Edelmira Linares, du Jardin Botanique de l'UNAM, du Mexique, du Docteur Angela Leiva, du Jardin Botanique National de Cuba, et du Docteur Carolann Baldyga, du Fairchild Tropical Botanic Garden, Etats-Unis. L'atelier s'est terminé par une discussion sur les différents aspects des programmes concernant le développement de l'éducation à l'environnement dans les Jardins Botaniques des CARAIBES.

Le plan d'action des Jardins Botaniques Européens

Au cours du premier congrès européen des Jardins Botaniques (Eurogard) qui s'est tenu au Jardin Botanique Royal d'Edimbourgh en avril 1997 une motion sur l'éducation a été élaborée pour être incluse dans le plan d'action des Jardins Botaniques Européens. Cette motion a été distribuée à tous les membres de l'atelier de travail sur l'éducation pendant le congrès. Après que les premiers commentaires aient été reçus, cette motion sera envoyée plus largement dans tous les Jardins botaniques Européens. Le Consortium des Jardins Botaniques Européens publiera ce plan d'action en 1998.

La Communauté Européenne finance des Jardins Marocains et Tunisiens

Le BGCI et Flore et Faune International (FFI) ont été dotés par la Commission Européenne pour financer la conservation de la biodiversité au

● noticias

de Andrómeda y BGCI, asistieron 30 participantes de 15 islas.

Durante la primera parte del taller se discutió sobre el Plan de Acción de las Islas del Caribe en los Jardines Botánicos. La conclusión final se envió a todos los Jardines Botánicos de las islas del caribe. La segunda parte del taller tuvo como tema central la educación ambiental en los Jardines Botánicos. El Dr. Joyce Glasgow, anterior profesor de la Universidad de las Indias Occidentales dio una charla sobre los medios en la educación ambiental en el caribe. Fue seguida por tres intervenciones más cortas realizadas por: Edelmira Linares del Jardín Botánico de la Universidad Nacional Autónoma de México (política pública eficaz), la Dra. Angela Leiva, del Jardín Botánico Nacional de Cuba (educación pública) y el Dr. Carolann Baldyga, del Jardín Botánico Tropical de Fairchild de los Estados Unidos de América (actualización del personal). El Taller finalizó con una discusión sobre los aspectos referentes al desarrollo de los programas de educación ambiental en los Jardines Botánicos Caribeños.

Plan de Acción de los Jardines Botánicos Europeos

Siguiendo la Primera Conferencia de Jardines Botánicos Europeos (Eurogard), celebrada en el Real Jardín Botánico de Edimburgo, en Abril de 1997, se preparó un borrador sobre educación para su inclusión en el Plan de Acción de los Jardines Botánicos Europeos. El borrador ha sido distribuido a todos los miembros del grupo de educación de la conferencia. Una vez hayan sido recibido sus comentarios, el borrador será distribuido a todos los Jardines Botánicos Europeos. El Consorcio de Jardines Botánicos Europeos tiene el proyecto de publicarlo en el Plan de Acción, en 1998.

La Comisión Europea (EC) financia los Jardines de Marruecos y Túnez

La Comisión Europea ha concedido a BGCI y Flora y Fauna Internacional

■ news

Institut National de la Recherche Agronomique de Tunisie, Ariana, Tunisia. The first steering group meeting for the project was held in Morocco in November 1997 to discuss the programme of activities. For more information contact BGCI.

Diploma Course in Botanic Garden Education

The next International Diploma Course in Botanic Garden Education will be held from April 19 to May 15 1999 at the Royal Botanic Gardens, Kew and BGCI, UK. The four week course will focus on a range of topics including environmental education, strategy development, teaching methodology, writing and radio skills, interpretation, marketing and fundraising. The course will provide students with a framework within which to place their definition of botanic garden education. For further information and to enrol for a place on the course contact: Julia Willison at BGCI or Barrie Blewett, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, U.K. Tel: 0181 332 5623, Fax: 0181 332 5610.

Future issues of Roots

Included with this issue of Roots is a questionnaire asking you to select three topics on which you would like to see Roots focus. Themes for 1998 have already been chosen - Focus on Africa and Education for Sustainability. Please take the time to complete the questionnaire and influence the choice of themes for Roots 1999.

NEWS FROM BOTANIC GARDENS AROUND THE WORLD

ARGENTINA

Botanic Garden Education course in Argentina

The first Argentinian botanic garden education course was held in September in Parana, Entre Rios. The two day course was attended by 60 delegates from botanic gardens in Argentina, students of the University of Agriculture of Entre Rios and participants working in NGOs.

▲ nouvelles

Maroc et en Tunisie par le développement du potentiel des Jardins Botaniques pour la conservation de la plante au niveau national et international et pour l'éducation à l'environnement. Les jardins concernés sont l'Institut Agronomique et Vétérinaire Hassan II, à Rabat, au Maroc, et l'Institut National de la Recherche Agronomique de Tunisie, à Ariana en Tunisie. La première réunion du comité de pilotage pour le projet s'est tenu au Maroc en novembre 1997 pour débattre du programme d'activité. Pour plus d'information contacter le BGCI.

Préparation au diplôme d'éducation dans les Jardins Botaniques

Le prochain cours de préparation au diplôme international d'éducation dans les Jardins Botaniques se tiendra du 19 avril au 15 mai 1999 aux Jardins Botaniques Royaux à Kew, au BGCI au Royaume-Uni. Durant les 4 semaines de cours il sera mis l'accent sur une série de thèmes incluant éducation à l'environnement, stratégie du développement, apprentissage des méthodes, capacité à écrire et à communiquer, interprétation, marketing et recherche de financement. Ce cours fournira aux étudiants un canevas dans lequel ils placeront leurs propres définitions de l'éducation dans les Jardins Botaniques. Pour plus d'information et postuler pour une place à ce cours contacter : Julia Willison au BGCI ou Barrie Blewett, Royal Botanic Gardens, Jardin Botanique de Kew, Richmond, Surrey, TW9 3AB, U.K. tél : 0181 3325623, Fax : 0181 332 5610.

Prochaine édition de Roots

Vous trouverez avec ce numéro de Roots un questionnaire qui demande de sélectionner trois sujets que vous aimeriez voir aborder dans Roots. Les thèmes pour 1998 ont déjà été choisis, ils sont centrés sur l'Afrique et l'éducation pour le développement. S'il vous plaît, prenez le temps de compléter le questionnaire, de le retourner au BGCI et de proposer des thèmes pour 1999.

● noticias

(FFI) una subvención para apoyar la conservación de la biodiversidad en Marruecos y Túnez, para desarrollar la capacidad de los jardines botánicos en la conservación internacional y nacional y la educación ambiental. Los Jardines implicados son el Instituto Agronómico y Veterinario Hassan II, Rabat, (Marruecos), y el Instituto Nacional de Investigación Agrónoma de Túnez, Ariana, (Túnez). La primera reunión del grupo directivo del proyecto se celebró en Marruecos en Noviembre de 1997, para discutir el programa de actividades. Para más información, contactar con BGCI.

Curso de Diploma en Educación en Jardines Botánicos

El próximo Curso Diploma en Educación en Jardines Botánicos tendrá lugar del 19 de Abril al 15 de Mayo de 1999 en el Real Jardín Botánico de Kew y BGCI, Reino Unido. Este curso de 4 semanas de duración se enfoca hacia un gran número de temas como la educación ambiental, desarrollo de estrategias, metodología educativa, habilidad en prensa y radio, desarrollo de técnicas de mercado y obtención de subvenciones. El curso proporcionará a los estudiantes una estructura dentro de la cual se incluya su definición de educación en un jardín botánico. Para información adicional y solicitar un plaza para el curso dirigirse a: Julia Willison en BGCI o Barrie Blewett, Royal Botanic Gardens, Kew, Richmond, Surrey, TW9 3AB, U.K. Tel: 0181 332 5623, Fax: 0181 332 5610.

Futuras Ediciones de Roots

En esta edición de Roots se incluye un cuestionario para que seleccione tres temas que le gustaría que Roots tratase. Los temas para 1998 ya están elegidos - Africa y Educación para el Desarollo - Por favor, complete este cuestionario, envíelo a BGCI y podrá influir sobre los temas a elegir para las ediciones de Roots de 1999.

■ news

Delegates making educational material during the 1st Argentinian Botanic Garden Education course

It covered topics ranging from identifying target groups, environmental education and its importance in conservation, making educational materials, and the use of games to support educational programmes. This was the first event run and organised by the Argentinian Network of Botanic Gardens (founded in November 1996), the Faculty of Agriculture and the Botanic Garden of Oro Verde, University of Entre Rios, Parana. Tutors for the course were Ms Edelmira Linares, President of the Latin American and Caribbean Association of Botanic Gardens and Head of Education and Awareness at the IBUNAM Botanic Garden, Mexico, Ms Gail Bromley, Head of Education, Royal Botanic Gardens, Kew, UK and Mr Juan Manuel López Ramírez, Head of Education, Viera y Clavijo Botanic Garden, Grand Canaria, Spain.

AUSTRALIA

Rod Dunstan - Churchill scholarship

Congratulations to Rod Dunstan of the Royal Botanic Gardens, Melbourne, Australia, who has been awarded a Winston Churchill Travelling Fellowship. Rod is visiting botanic gardens and similar institutions in Europe and the United States to research how multimedia can be used to enhance education programmes.

▲ nouvelles

NOUVELLES DES JARDINS BOTANIQUES À TRAVERS LE MONDE

ARGENTINE

Cours d'éducation pour les Jardins Botaniques en Argentine

Le premier cours d'éducation pour les Jardins Botaniques Argentins s'est tenu en septembre au Parana à Entre Rios. Les deux jours de session ont été suivis par 60 délégués de Jardin Botanique d'Argentine, des étudiants de l'Université d'Agriculture d'Entre Rios et des participants travaillant dans des organisations non gouvernementales. Il couvrait des sujets comme l'identification des groupes cibles, l'éducation à l'environnement et son importance dans la conservation, la fabrication de matériaux pour l'éducation, et l'utilisation de jeux pour soutenir des programmes éducatifs. C'était le premier évènement conduit et organisé par le réseau des Jardins Botaniques Argentins fondé en novembre 1996, la faculté d'Agriculture et le Jardin Botanique d'Oro Verde, l'Université d'Entre Rios, le Parana. Les responsables de ce cours étaient Edelmira Linares, Président de l'Association des Jardins Botaniques latino américains et caraïbes, Chef de

● noticias

NOTICIAS DE LOS JARDINES BOTANICOS DEL MUNDO

ARGENTINA

Jornadas Argentinas de Educación en Jardines Botánicos

En Septiembre de este año se celebraron en Paraná, Entre Ríos, las Primeras Jornadas Argentinas de Educación en Jardines Botánicos. A este curso de tres dias, asistieron 60 delegados de Jardines Botánicos Argentinos, estudiantes de la Facultad de Ciencias Agropecuarias de la Universidad de Entre Ríos y representantes de Organizaciones no Gubernamentales (ONG). El curso trató sobre la importancia de la educación para la conservación en los jardines botánicos, recursos didácticos para la educación, la importancia de los Jardines como centros para la conservación de la biodiversidad y el uso de los juegos como complemento de los programas de educación. Estas primeras jornadas fueron organizadas por la Red Argentina de Jardines Botánicos (fundada en 1996) y el Jardín Botánico Oro Verde de la Facultad de Ciencias Agropecuarias de la Universidad Nacional de Entre Ríos. Los responsables del curso fueron Dña Edelmira Linares, Presidenta de la Asociación Latinoamericana y del Caribe de Jardines Botánicos y coordinadora de Educación del Jardín Botánico del Instituto de Biología de la UNAM, México; Ms. Gail Bromley Coordinadora de Educación del Real Jardín Botánico de Kew, Londres; el Dr. Carlos Villamil de la Comisión para la Supervivencia de las Especies de la UICN, y el biólogo D. Juan Manuel López Ramírez Coordinador de Educación y Relaciones Externas del Jardín Botánico Canario 'Viera y Clavijo', Gran Canaria, España.

AUSTRALIA

Rod Dunstan - Beca Churchill

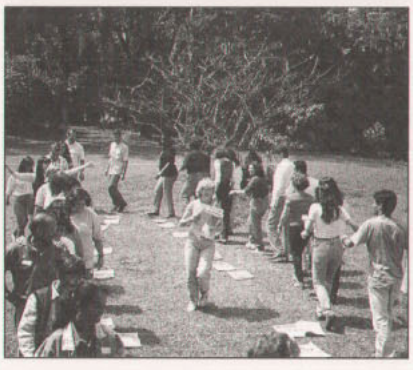
Felicidades a Rod Dunstan del Real Jardín Botánico de Melbourne, Australia que ha sido galardonado con

■ news

BRAZIL

Botanic Garden Education Course in Brazil

Over 40 delegates attended a botanic garden education course held at the Sao Paulo Botanic Garden, Brazil in September 1997 as part of the Third Regional Meeting of Botanic Gardens of the state of Sao Paulo, Brazil. The two day course aimed to raise awareness of the potential of botanic gardens in environmental education and their importance in conservation. The themes provided many opportunities for 'hands on' activities, dialogue and interaction. Following two intensive days of work, which included both theoretical and practical sessions, each garden participant developed an educational strategy for their garden. This course was organised by the Brazilian Association of Botanic Gardens and the Sao Paulo Botanic Garden, Brazil. The two tutors for the course were Ms Edelmira Linares, President of the Latin American and Caribbean Association of Botanic Gardens and Head of Education and Awareness at the IBUNAM Botanic Garden, Mexico and Ms Gail Bromley, Head of Education, Royal Botanic Gardens, Kew, UK.



▲ nouvelles

l'Education au Jardin Botanique IBUNAM, au Mexique, Madame Gail Bromley, Chef du Service Education aux Jardins Botaniques Royaux à Kew, Royaume-Uni et Monsieur Juan Manuel López Ramírez, Chef de l'Education au Jardin Botanique Viera y Clavijo, Grande-Canarie, Espagne.

AUSTRALIE

Bourse d'étude Churchill

Félicitations à Rod Dunstan des Jardins Botaniques Royaux de Melbourne, en Australie, à qui a été décerné une dotation de voyage de l'Association Winston Churchill. Rod visite les Jardins Botaniques et les institutions analogues en Europe et aux Etats-Unis pour rechercher comment les multimédias peuvent être utilisés pour promouvoir les programmes d'éducation.

BRAZIL

Cours d'éducation pour les Jardins Botaniques

Plus de 40 délégués ont suivi un cours pour les Jardins Botaniques, au Jardin Botanique de Sao Paulo, au Brésil, en septembre 1997. Ce cours tenait lieu de 3ème rencontre régionale des Jardins Botaniques de l'Etat de Sao Paulo, au Brésil. Les deux jours de cours avaient pour but de mettre en relief la prise de conscience du potentiel des Jardins Botaniques dans l'éducation à l'environnement et leur importance dans la conservation. Les thèmes ont fourni de nombreuses possibilités pour les activités manuelles, le dialogue et les activités interactives. Après deux jours d'activité de travail intensif qui incluaient à la fois théorie et pratique, chaque jardin a développé une propre stratégie éducative pour lui-même. Ce cours était organisé par l'association brésilienne des Jardins Botaniques et le Jardin Botanique de Sao Paulo, Brésil. Les deux responsables de ce cours étaient Edelmira Linares, Président de l'Association des Jardins Botaniques latino américains et caraïbes et en même temps

● noticias

el Winston Churchill Travelling Fellowship. Rod está visitando los jardines botánicos e instituciones similares de Europa y Estados Unidos para investigar como los programas multimedia pueden ser utilizados para mejorar los programas de educación.

BRASIL

Curso de Educación en Jardines Botánicos

A este curso de educación en jardines botánicos celebrado en Septiembre de 1997 en el Jardín Botánico de Sao Paulo, Brasil, como parte de la Tercera Reunión de Jardines Botánicos del Estado de Sao Paulo, asistieron 40 delegados. En los dos días que duró el curso se trató el tema del potencial de los jardines botánicos en la educación y su importancia en la conservación. Durante estos días intensivos de trabajo cada participante desarrolló una estrategia educativa para su jardín. Este curso fue organizado por la Asociación Brasileña de Jardines Botánicos y el Jardín Botánico de Sao Paulo, Brasil. Los responsables del curso fueron Dña. Edelmira Linares, Presidenta de la Asociación Latinoamericana y del Caribe de Jardines Botánicos y coordinadora de Educación del Jardín Botánico del Instituto de Biología de la UNAM, México, y Ms. Gail Bromley Coordinadora de Educación del Real Jardín Botánico de Kew, Londres.

CHINA

Exposición Subacuática

Desde que en 1996 fue inaugurada la nueva galería, más de 10.000 personas han visitado la exposición "Plantas Sumergidas" en el Jardín Botánico del lago Shenzhen Fair. La exposición contiene un gran de número acuarios en los que están representados cada uno de los hábitats sumergidos. Están presentes 17 familias y 35 especies de plantas, 10 de las cuales son nativas de China. Para más información contactar con: Feng Huiling, Education Officer,

Top: Exhibition of vegetable puppets created during the Botanic Gardens Education course in Brazil

Bottom: Students on the course participating in the biodiversity game

■ news

Plants Under Water exhibition at the Shenzhen Fairy Lake Botanic Garden, China

CHINA

Underwater Exhibition
Since the new gallery opened in 1996, over 10,000 people have visited the 'Plants Under Water' exhibition at the Shenzhen Fairy Lake Botanic Garden. The exhibition includes a large number of aquaria, each containing an underwater habitat. 17 families and 35 species of plants are on display, 10 of which are native to China. For more information contact: Feng Huiling, Education Officer, Shenzhen Fairy Lake Botanic Garden, Liantang, Shenzhen 518004, China. Tel: 00 86 755 5736614. Fax: 00 86 755 5736717 (day).

INDIA

School in the Forest
During 1996-97 the Gurukula Botanical Sanctuary in southern India hosted a year long educational programme for the Centre for Learning (CFL), a small school in urban Bangalore, 250kms away. Over the academic year, all students (from ages six to 18) and teachers visited GBS in small groups for 1-3 weeks each, to learn about plants, animals, the rainforest environment and the work of the garden. GBS, itself partly forested, provides an excellent opportunity for young minds to explore their native biodiversity and to interact with it in many different ways.The programme emphasised direct learning through the senses and enquiry based learning. Activities included scavenger and treasure hunts, botanizing, river study, excursions, garden work, discussions, art and writing, and tree climbing. Deepening the individual's sensitivity

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responsable de l'éducation et de l'éveil au Jardin Botanique IBUNAM, au Mexique et Gail Bromley, responsable de l'éducation aux Jardins Botaniques Rayaux à Kew (Royaume-Uni).

CHINE

Exposition subaquatique
Depuis que la nouvelle galerie a été ouverte en 1996, plus de 10 000 personnes ont visité l'exposition "Plantes sous les eaux" au Jardin botanique du Lac Féerique à Shenzhen. L'exposition comprend un grand nombre d'aquariums, chacun contenant un habitat subaquatique. 17 familles et 35 espèces de plantes sont exposées, 10 d'entre elles sont indigènes à la Chine. Pour plus d'informations contacter: Feng Huiling, Education Officer, Shenzhen Fairy Lake Botanic Garden, Liantang, Shenzhen 518004, China. Tel. 00 86 755 5736614. Fax : 0086 755 5736717 (le jour).

INDES

Une école dans la forêt
Durant l'année 1996-97, la réserve botanique Gurukula dans le sud de l'Inde a abrité pendant une année entière un séjour éducatif pour le centre d'apprentissage (CFL), d'une petite école de Bengalore, à 250 km. Au delà du programme scolaire classique, les élèves agés de 6 à 18 ans et les professeurs ont visité la réserve botanique de Guruluka par petits groupes durant une à trois semaines chacun, pour étudier les plantes, les animaux, l'environnement de la forêt ombrophile et les travaux

● noticias

Shenzhen Fairy Lake Botanic Garden, Liantang, Shenzhen 518004, China. Tel: 00 86 755 5736614. Fax: 00 86 755 5736717 (day).

INDIA

Escuela en el Bosque
Durante 1996 y 97 el Santuario Botánico de Gurukula en el Sur de la India llevó a cabo un extenso programa de educación de un año de duración en el centro para el Aprendizaje (CFL), una pequeña escuela en la ciudad de Banagalore, que se encuentra a 250 kms. de distancia. Durante ese año académico, todos los estudiantes visitaron el Santuario Botánico de Gurukula (GBS) en pequeños grupos, con una estancia de 1 a 3 semanas cada uno, para conocer las plantas, los animales, el medio ambiente de la selva y el trabajo en el jardín. GBS, proporciona a los estudiantes una excelente oportunidad para explorar la biodiversidad nativa y conocerla por experiencia propia.

El programa se centio en el aprendizaje directo a través de los sentidos y la investigación basada en el aprendizaje. Entre las actividades realizadas se destacaron: basureros y búsqueda de tesoros, estudio de la flora, estudio del río, excursiones, trabajo en el jardín, discusiones, arte y literatura, y ascenso a los árboles. Una parte muy importante de la estancia de los niños y los profesores en el santuario fue el profundizar en la sensibilidad del individuo y en su concienciación en los procesos naturales, al vivir y formar parte de un escenario selvático o semiselvático. La evaluación de los 80 estudiantes que tomaron parte fue muy positiva. El programa tuvo tanto éxito que otros centros escolares han solicitado participar. CFL también va a enviar en Enero a sus alumnos de 12 años para reptir la experiencia.

Estos programas educativos intensivos forman parte de la creciente preocupación de GBS, que establece que no puede haber solución

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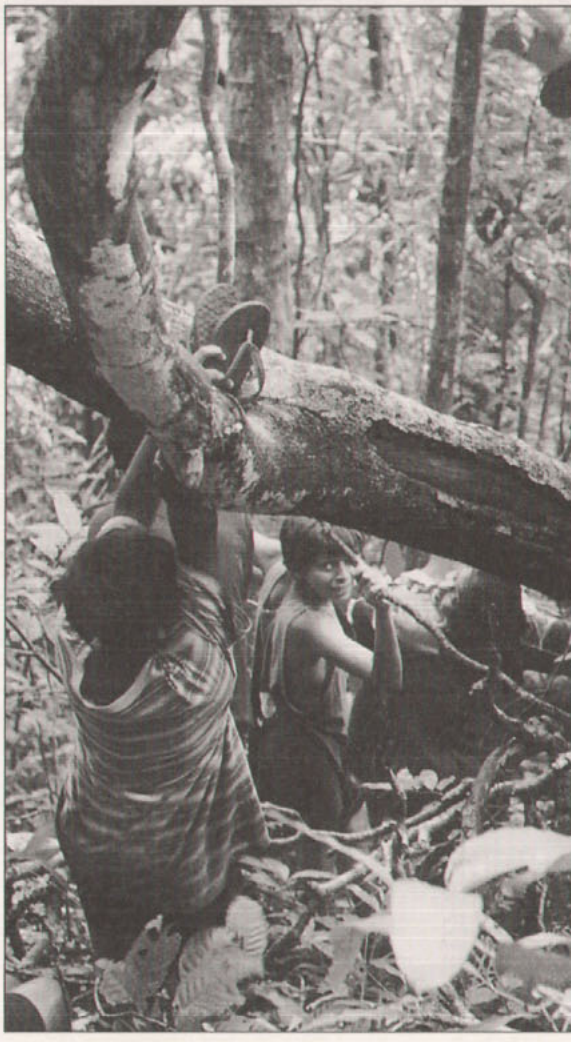
The School in the Forest programme emphasised direct learning through the senses and enquiry based learning



and awareness of natural processes by living and functioning in a wild/semi-wild forest setting was a critical part of the children's and teachers' stay at the sanctuary. Evaluation from the 80 individuals who took part was extremely positive. The programme was such a success that other schools have requested to participate. CFL is also sending its 12 year olds for a six week stay in January, for more of the same! These intensive educational programmes are part of GBS's growing concern that there can be no environmental solution without directly addressing the human factor, especially the future generation. For more information contact: Suprabha Seshan, Education Coordinator, Gurukula Botanical Sancturay, Alattil P.O., North Wayanad, Kerala 670 644, India.

horticoles. La RBG, elle-même partiellement en forêt, fournit une excellente opportunité pour de jeunes esprits d'explorer les milieux naturels de leur pays et de savoir en tirer parti dans différentes circonstances. Ce programme met en avant l'apprentissage direct par les sens et l'enseignement basé sur un système d'enquêtes. Les activités comprennent le ramassage de déchets et la chasse au trésor, la botanique de terrain,l'étude des rivières, des excursions, des travaux de jardin, des débats, des activités artistiques et littéraires, et du grimpage. Durant leur séjour à la réserve, les élèves et leurs professeurs ont acquis des notionscritiques sur l'approfondissement de la sensibilité individuelle, la prise de conscience des

medioambiental sin la intervención directa del factor humano, especialmente las futuras generaciones. Para más información contactar con: Suprabha Seshan, Education

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SOUTH AFRICA

Practical ways to teach issues relating to Agenda 21 was the focus of two workshops run during August at Kirstenbosch Botanic Garden, Capetown and Botanic Garden, Natal. Bill Graham of the Birmingham Botanical Gardens, UK was the tutor for both workshops.

Delegates met at Kirstenbosch to discuss ways of teaching Agenda 21

SPAIN

New exhibition in Grand Canaria

An new exhibition on the natural history of Grand Canaria was inaugurated during the 45th anniversary celebrations of the Viera y Clavija Botanic Garden. The exhibition displays information on six ecosystems, covering their history, protected areas, effects of humans on the ecosystem, fauna and flora, conservation status and location in the Botanic Garden. Its aim is for nature conservation to become an important aspect in the daily lives of the islanders and visitors. The exhibition is supported by Mr Carmelo Ramírez, President of the Area of Strategic Planning and Environment, Grand Canaria Town Council. For more information contact: Juan Manual Lopéz Ramírez, Jardín Botánico Canario 'Viera y Clavijo', Apartado de Correos 14, Tafira Alta, 35017 - Las Palmas de Gran Canaria, Gran Canaria, Spain. Tel: (34 28) 353604. Fax: (3428) 352250. Email: jardcan@ext.step.es.

▲ nouvelles

processus naturels de la vie et du fonctionnement d'une forêt sauvage ou semi-sauvage. L'évaluation faite par les 80 participants a été extrêmement positive. Le programme a été un tel succès que d'autres écoles ont demandé à participer. Le centre d'apprentissage a prévu d'envoyer aussi les 12 ans pour 6 semaines en janvier pour bénéficier de ces acquis! Ces programmes complets d'éducation sont une des propositions majeures de la RBG à savoir qu'il ne peut y avoir de solution environnementale sans le facteur humain et spécialement les générations futures. Pour plus d'informations contacter Suprabha Seshan, Education Coordinator, Gurukula Botanical Sancturay, Alattil P.O., North Wayanad, Kerala 670 644, India.

AFRIQUE DU SUD

Les moyens pratiques de travailler les documents relatifs à l'Agenda 21 ont été le sujet de deux ateliers qui se sont tenus en août aux jardins botaniques de Kirstenbosch, du Cap, et du Natal. Bill Graham, du jardin botanique de Birmingham, Royaume-Uni, était le responsable pour les deux ateliers.

SPAIN

Nouvelle exposition à Grande Canarie

Une nouvelle exposition sur l'histoire naturelle de la Grande Canarie a été inaugurée à l'occasion de la célébration du 45ème anniversaire du Jardin Botanique Viera y Clavijo. L'exposition présente des informations sur six écosystèmes, comprenant leur histoire, les zones protégées, l'impact de l'homme sur ces écosystèmes, la faune et la flore, les statuts de conservation et leur emplacement dans le Jardin Botanique. Son but est que la conservation de la nature prenne plus d'importance dans la vie quotidienne des habitants de l'île et de ses visiteurs. L'exposition est appuyée par Mr Carmelo Ramirez, Président du Secteur de la Planification Stratégique et de l'Environnement, Conseil Municipal de Grande Canarie. Pour

● noticias

Coordinator, Gurukula Botanical Sancturay, Alattil P.O., North Wayanad, Kerala 670 644, India.

SUDÁFRICA

Los objetivos de los dos talleres celebrados en Agosto en los Jardines Botánicos de Kirstenbosch y Natal de Ciudad del Cabo, fueron enseñar las formas prácticas de tratar los temas relacionados con la Agenda 21. El tutor de los dos talleres fue Bill Graham del Jardín Botánico de Birmingham, Reino Unido.

ESPAÑA

Nueva exposición en Gran Canaria

Durante el 45 aniversario del Jardín Botánico Viera y Clavijo, se inauguró la exposición sobre Historia Natural en Gran Canaria. En la exposición se muestra información sobre seis ecosistemas, su historia, áreas protegidas, efectos del hombre en los ecosistemas, fauna y flora, estado de conservación y localización en el ardín Botánico. Su proposito es que la conservación de la naturaleza llegue a tener un papel importante en la vida diaria de los isleños y visitantes. La exposición ha sido financiada por D. Carmelo Ramírez, Presidente del Area de Planificación Estratégica y Medio Ambiente del ayuntamiento de Gran Canaría. Para más información contactar con: Juan Manuel López Ramírez, Jardín Botánico Viera y Clavijo, Apartado de Correos 14, Tarifa Alta, 35017 Las Palmas de Gran Canaria, Gran Canaria, España, Tel: 34 28 353604, Fax: 34 28 352250, E-mail: jardcan@ext.step.es

REINO UNIDO

Conferencia Anual de BGEN

En el 10º Aniversario de la Red de Educación de Jardines Botánicos, se reunieron en Septiembre 54 delegados en el Jardín Botánico de Edimburgo. Los delegados disfrutaron de una excursión previa a la conferencia a los jardines botánicos de Younger y Glasgow.

■ news

Delegates at the 1997 BGEN conference

UK

Annual BGEN conference

54 delegates met at the Royal Botanic Garden, Edinburgh, Scotland, this September, for the tenth anniversary meeting of the Botanic Garden Education Network (BGEN). Delegates enjoyed a preconference trip to Younger Botanic Garden and Glasgow Botanic Garden before being challenged and inspired by two days of keynote speeches and workshops. For more information contact: Ian Darwin Edwards, Royal Botanic Garden, Edinburgh, 20A Inverleith Row, Edinburgh EH3 5LR, UK. Tel: 0131 552 7171. Fax: 0131 552 0382.

Medicinal Plant Summer School at Chelsea

The Chelsea Physic Garden has successfully held a two week summer school on medicinal plants. The first week was an adult education programme, including practical sessions on making ointments and oils and learning about the medicinal plant trade. The second week was for professionals working in the field of medicinal plants. Highlights of this week included thin layer chromatography to check the identity of dried herbs, and a lecture looking at how immigrants to Great Britain have added their plant uses to the

▲ nouvelles

plus d'information, contacter: Juan Manuel López Ramírez, Jardin Botanico Canario 'Viera y Clavijo', Apartado de Correos 14, Tafira Alta, 35017 - Las Palmas de Gran Canaria, Gran Canaria, Spain. Tel: (34 28) 353604 . Fax: (34 28) 352250. Email: jardcan@ext.step.es.

ROYAUME-UNI

La conférence annuelle du réseau d'éducation des Jardins Botaniques (BGEN)

54 délégués se sont rencontrés au Jardin Botanique Royal d'Edimbourgh en Ecosse, ce mois de septembre, pour le 10ème anniversaire du réseau éducatif des Jardins Botaniques (BGEN). Les délégués ont apprécié un voyage avant la conférence au Younger Botanic Garden et au Jardin Botanique de Glasgow avant d'être inspirés et stimulés par deux jours de conférence et d'atelier. Pour plus d'informations contacter: Ian Darwin Edwards, Royal Botanic Garden, Edinburgh, 20A Inverleith Row, Edinburgh EH3 5LR, UK. Tel: 0131 552 7171. Fax: 0131 552 0382.

Université d'été sur les plantes médicinales à Chelsea

Il s'est tenu au Chelsea Physic Garden avec succès une université d'été de deux semaines sur les plantes

● noticias

Escuela de Verano de Plantas Medicinales en Chelsea

Durante dos semanas ha tenido lugar en el Jardín de Chelsea, la escuela de verano de plantas medicinales. La primera semana se celebró un programa de educación de adultos, que incluyó sesiones prácticas sobre como obtener linimentos y aceites y sobre el comercio de plantas medicinales. La segunda semana estuvo dedicada a profesionales que trabajan en el cultivo de plantas medicinales. Lo más destacado de esta semana fue la inclusión de la cromatografía de capa fina para la identificación de plantas disecadas, y una conferencia sobre cómo los inmigrantes a Gran Bretaña han añadido sus usos de las plantas a las tradiciones indígenas (Anglosajones y Druidas). Para más información contactar con: Sue Minter, Curator, Chelsea Physic Garden, 66 Royal Hospital Road, Chelsea, London SW3 4HS, UK. Tel: 0171 352 5646. Fax: 0171 376 3910.

Matemáticas en el Jardín

Se celebró un día de prácticas en el Jardín Botánico de Birmingham para descubrir nuevos caminos de utilización del jardín botánico para complementar la enseñanza de las matemáticas en el Plan Nacional de Estudios de Inglaterra y Gales.

Continuando su colaboración con una Galería local de Arte, el Jardín Botánico de Birmingham ha organizado una exposición titulada "Las delicias de la Tierra". A través de pinturas, esculturas, instalaciones y sonidos, los artistas examinan la manera en que la naturaleza y la cultura se unen en el Jardín. Para más información, contactar con: Bill Graham or Sue Bird, Birmingham Botanical Gardens, Study Centre, Westbourne Road, Edgbaston, Birmingham B15 3TR, UK. Tel: 0121 454 0784. Fax: 0121 454 7835.

ESTADOS UNIDOS

El tour guiado por medio del lenguaje de los signos

Desde Abril de este año, El tren del Morton Arboretum, el Acorn Express,

■ news

indigenous (Anglo-Saxon and Druid) traditions. The Garden plans to run another school next year. For more information contact: Sue Minter, Curator, Chelsea Physic Garden, 66 Royal Hospital Road, Chelsea, London SW3 4HS, UK. Tel: 0171 352 5646. Fax: 0171 376 3910.

Students and staff at the Medicinal Plant Summer School in Chelsea Physic Garden

Maths in the Garden

An in-service training day (INSET) was held at the Birmingham Botanical Gardens to look at novel ways of using the botanic garden to complement the teaching of mathematics in the National Curriculum of England and Wales.

Pocket book computers being used to enter data on leaf sizes

Continuing their collaboration with a local art gallery, Birmingham Botanical Gardens (UK) have organised an art exhibition entitled "Earthly Delight". Through drawings, sculpture, installations and sound, the artists examine the way that nature and culture collide in the garden. For more information contact: Bill Graham or Sue Bird, Birmingham Botanical Gardens, Study Centre, Westbourne Road, Edgbaston, Birmingham B15 3TR, UK. Tel: 0121 454 0784. Fax: 0121 454 7835.

USA

Sign Language Interpreted Tram Tours

Since April of this year, The Morton Arboretum's new open-air tram, the Acorn Express, has introduced thousands of visitors to the Arboretum's 1,700-acre grounds through a narrated tour. Now, the same 50 minute tour is being offered to the hearing impaired community through sign language

▲ nouvelles

médicinales. La première semaine comprenait un programme d'éducation pour adultes, incluant des ateliers pratiques sur la fabrication des onguents et des huiles, et des cours sur le commerce des plantes médicinales. La seconde semaine était consacrée aux professionnels travaillant dans le domaine des plantes médicinales. Les points forts de cette semaine incluaient des manipulations de chromatographies en couche mince pour vérifier l'identité de plantes séchées, et une conférence montrant comment les immigrants en Grande-Bretagne ont ajouté leurs usages des plantes aux traditions indigènes, (des Anglo-Saxons et des Druides). Le jardin prévoit une autre université l'année prochaine. Pour plus d'informations contacter: Sue Minter, Curator, Chelsea Physic Garden, 66 Royal Hospital Road, Chelsea, London SW3 4HS, UK. Tel: 0171 352 5646. Fax: 0171 376 3910.

Mathématiques au jardin

Une journée d'exercice s'est tenue aux Jardins de Birmingham pour examiner un moyen original d'utiliser le Jardin Botanique pour complémenter l'enseignement des mathématiques (National Curriculum) d'Angleterre et du Pays de Galles.

Poursuivant leur collaboration avec une galerie d'art, les Jardins Botaniques de Birmingham (Royaume-Uni) ont organisé une exposition intituée "les délices de la terre". A travers des peintures, des sculptures, des montages et de la musique, les artistes ont explorés les moyens par lesquels la nature et la culture se rencontrent dans le jardin. Pour plus d'informations contacter : Bill Graham or Sue Bird, Birmingham Botanical Gardens, Study Centre, Westbourne Road, Edgbaston, Birmingham B15 3TR, UK. Tel: 0121 454 0784. Fax: 0121 454 7835.

ETATS-UNIS

Des visites en train pour l'interprétation du langage des étiquettes

Depuis avril de cette année le nouveau train découvert de l'arboretum Morton,

● noticias

ha llevado a miles de visitantes por los 1.700 acres del Arboretum a través de un tour hablado. Ahora, el mismo tour de 50 minutos de duración, se ofrece a personas impedidas de audición por medio del lenguaje de los signos. Para más información contactar con: Sarah Solsvig, The Morton Arboretum, The Morton Arboretum, 4100 Illinois Route 53, Lisle, Illinois 60532-1293, USA. Tel: 630 968 0074. Fax: 630 719 2433.

ZIMBABWE

Centro de Educación e Interpretación

Un Centro de Educación e Interpretación ha sido construido en el Jardín Botánico Nacional de

■ news

interpreted tours. For more information contact: Sarah Solsvig, The Morton Arboretum, 4100 Illinois Route 53, Lisle, Illinois 60532-1293, USA. Tel: 630 968 0074. Fax: 630 719 2433.

ZIMBABWE

Education and Interpretive Centre
An education and interpretive centre has been built at the National Botanic Garden, Zimbabwe. The centre consists of three buildings: the Auditorium/ Education building, an open sided stone building with a thatched roof and seating capacity for 120 people; the Desert House, a greenhouse designed to grow plants from arid areas and; the Tea House, a thatched stone building. For more information contact: Soul Shava, National Herbarium and Botanic Garden, P O Box CY 550 Causeway, Harare, Zimbabwe. Tel: 744170, 725313. Fax: 708938.

OTHER NEWS

Julia's hitched!
Congratulations to Julia Willison, BGCI Head of Education and co-editor of Roots, who married her long-term partner, David, in September 1997.

APPOINTMENTS

New education officer for Cambridge
Ms Christine Preston has taken up the post of Education and Interpretation Officer at the University Botanic Garden, Cambridge (UK). Christine's work background combines business with environmental biology, horticulture and education. The post is funded jointly by the University of Cambridge and the Friends of the Botanic Garden.

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l'Acorn Express, a conduit des milliers de visiteurs dans les 1700 acres de l'arboretum pour une visite guidée. Maintenant une visite de 50 minutes est offerte à des défavorisés pour la découverte du langage des étiquettes. Pour plus d'informations contacter: Sarah Solsvig, The Morton Arboretum, 4100 Illinois Route 53, Lisle, Illinois 60532-1293, USA. Tel: 630 968 0074. Fax: 630 719 2433.

ZIMBABWE

Centre d'éducation et d'interprétation
Un centre d'éducation et d'interprétation a été construit au Jardin Botanique National au Zimbabwe. Le centre consiste en trois bâtiments: l'auditorium ou bâtiment éducatif, bâtiment en pierre avec un côté ouvert et un toit de chaume avec une capacité de 120 places; la Maison du Désert, une serre dédié aux plantes des zones arides; et la Maison du Thé, un bâtiment de pierre et de chaume. Pour plus d'informations contacter: Soul Shava, National Herbarium and Botanic Garden, P O Box CY 550 Causeway, Harare, Zimbabwe. Tel: 744171. 725313. Fax: 708938.

AUTRES NOUVELLES

Julia s'est mariée !
Félicitations à Julia Willison, chef du Département pour l'Education du BGCI et co-éditrice de Roots, qui s'est mariée avec son compagnon de longue date, David, en septembre 1997.

Un nouveau responsable de l'éducation pour Cambridge
Mademoiselle Christine Preston a pris le poste de responsable de l'éducation et de l'interprétation au Jardin Botanique de l'Université de Cambridge (Royaume-Uni). Le travail de Christine combine des activités en biologie environnementale, horticulture et éducation. Le poste est financé conjointement par l'Université de Cambridge et les Amis du Jardin Botanique.

● noticias

Zimbabwe. El centro está constituido por tres edificios: El Edificio de Educación/Auditorio, un edificio de piedra abierto por los lados con un techo de paja y capacidad para 120 personas sentadas, la Casa del Desierto, un invernadero para cultivar plantas de zonas áridas, y la Casa del Te un edificio de piedra con techo de paja. Para más información contactar con: Soul Shava, National Herbarium and Botanic Garden, P O Box CY 550 Causeway, Harare, Zimbabwe. Tel: 744170, 725313. Fax: 708938.

OTRAS NOTICIAS

¡Julia se ha casado!
Julia Willison, Coordinadora de Educación de BGCI y Coeditora de Roots , se casó en Septiembre de 1997 con David, tras un largo noviazgo.

NOMBRAMIENTOS

Nueva responsable de educación en Cambridge
Christine Preston ha tomado posesión de la plaza de funcionaria de Educación e Interpretación del Jardín Botánico de la Universidad de Cambridge, Reino Unido. Christine combina los negocios con la biología medio ambiental, la horticultura y la educación. La plaza ha sido creada conjuntamente por la Universidad de Cambridge y los Amigos del Jardín Botánico.

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Pourquoi mener une recherche en éducation à l'environnement ?

¿ Porqué la investigación del comportamiento en la educación medioambiental ?

Why Conduct Research in Environmental Education ?

There is an increasing emphasis being placed on the links between research and the improvement of practice

Context

Surely there can be little doubt about the urgent need for promoting change in attitudes and behaviour in relation to the environment; for encouraging people to appreciate and enjoy the world around them and for equipping policy-makers, both present and future, with the knowledge, skills and attitudes that will encourage them to adopt environmentally responsible approaches. Around the world there is active debate on how best to achieve these goals and on the most appropriate strategies for developing and implementing programmes of environmental education. Contributors to a chapter on 'The Global Scene' in environmental education for a book I have recently completed (Palmer 1998a) write very positively and optimistically about the general state of environmental education. For example, from Canada we hear that 'there is evidence to support the notion that environmental education-related activity is thriving within elementary schools'; in Spain 'the prospects are good for collective effort and achievements'; in Australia 'the prospects remain bright… teachers find a way of engaging in environmental education even in circumstances where this is against the grain'; in Uganda there is a new National Environmental Education Strategy for the Formal Education Sector; in Slovenia it is envisaged that environmental education will form part of the national curricula for all schools; in South Africa, there are recently introduced environmentally related requirements for teacher education, and so on.

At a global level, debate and activity in the field of environmental education is indeed healthy; yet there remain numerous ongoing issues to resolve, and serious challenges ahead. Despite the optimistic tone adopted, quite rightly, by many environmental educators, it is nevertheless clear that education is far from realising its maximum potential in terms of helping people understand and appreciate the environment and their role as producers and consumers within it. In this brief article I shall focus on one of the many challenges recognised around the world, namely the need to increase the environmental education research base and broaden approaches to research in this field.

Does Environmental Education Matter?

Perhaps a useful starting point is with research itself - a description of some research which endorses the point made above, that formal education programmes are nowhere near as successful as they might be in terms of developing ecological thinking and pro-environmental behaviours. In the limited space available, reference will be made to three studies in which the author is engaged. The first, on the development of concern for the environment and influences and experiences affecting the pro-environmental behaviour of educators (Palmer 1993; Palmer and Suggate 1996), examines the relative importance of various categories of influence and formative life experiences on the development of environmental educators' knowledge of and concern for the environment. The motivation for this study was the belief that if a fundamental aim of education is to help pupils and students understand, appreciate and care for the environment, then those responsible for this area of the curriculum should know the types of learning experience that help to develop active and informed minds.

The study was distributed in the first instance to environmental educators in the UK and later in various international locations. Subjects were asked to

provide details of their age group, gender, and demonstration of practical concern for the environment. Then they were asked to write an autobiographical statement identifying those experiences and formative influences that led to this concern, to state what they considered to be their most significant life experiences, and to write a statement indicating which, if any, of the years of their lives were particularly memorable in the development of positive attitudes towards the environment. As the outline and *pro formas* gave only the aims and purposes of the research, the participants were able to provide original responses unbiased by any examples. We aimed to confirm the sample as a group of active and informed citizens: that is, those who know and care about the environment in their adult life (by asking subjects to give details of their demonstration of activity and practical concern for the environment), and indeed this was duly done.

In the UK sample there were 232 responses; 102 from male subjects and 130 from female subjects. Of the respondents, 55 were in the under 30 age group, 124 in the 30-50 year group and 53 in the over 50 year group. The autobiographical statements giving details of formative influences and significant life experiences leading to a commitment to environmental concerns were analysed, and the results were coded into categories of response. The number of subjects identifying with each major category of response is shown in **Table 1**.

The category 'outdoors' includes three substantial subcategories: childhood outdoors (97 respondents), outdoor activities (90 respondents) and wilderness/solitude (24 respondents). 'Education/Courses' refers to two subcategories: higher education or other courses taken as an adult (85 respondents) and school courses (51 respondents).

More detailed descriptions of the data analysis and conclusions drawn will be found elsewhere - of both the initial analysis (Palmer 1993) and of a more fine-grained analysis which looks not only at patterns of influence across the whole sample, but also by age group (Palmer and Suggate 1996). The relevance of this work here lies in its illumination of the role of education in developing environmental awareness. As one might well expect, both the initial and fine-grained analyses of the data show that education, alongside the impact of parents, other close relatives, books, TV, media, the impact of environmental disasters, travel and so on plays a significant role in promoting environmental awareness and concern. Yet the single most important influence overall is childhood experiences 'outdoors' - in the natural world. Other 'outdoor activities' are also highly significant. The apparent impact of secondary and higher education courses on environmental understanding is very encouraging - of the seven subjects who cited education as being the single most important influence on their thinking, five were writing about degree level courses. Of the 51 respondents citing school-based work as a significant influence, 38 referred to Advanced-level courses and related fieldwork. Perhaps the most disturbing aspects of the education-related data are that 23 individuals chose to report that school programmes had had no influence upon them whatsoever, and there was not one reference to a school course below Advanced-level as a single most important influence. All of the many accounts of the importance of childhood talked of such things as experiences outdoors, the influence of parents, friends, the media and so on; with very few references to school-based lessons.

Table 1:
Formative Influences on Environmental Concern

Category of Influence	Respondents	
	No.	Per Cent
Outdoors	211	91
Education/Courses	136	59
Parents/Close relatives	88	38
Organisations	83	36
TV/Media	53	23
Friends/Other individuals	49	21
Travel abroad	44	19
Disasters/Negative issues	41	18
Books	35	15
Becoming a parent	20	9
Keeping pets/animals	14	6
Religion/God	13	6
Others	35	15

Two other on-going research projects provide further evidence that education courses are not as influential as one might expect or hope for. First, a project on 'The Global Environment and the Expanding Moral Circle' (Cooper and Palmer, publications in preparation) aims to investigate recent changes in attitudes and feelings of responsibility towards the environment, animals and future generations. As part of the project, 182 individual subjects from the local community filled in questionnaires which probed their views and attitudes relating to the research agenda. In response to the question 'what would you identify as the single most important influence or experience which has affected your attitude to our responsibility towards (a) animals? and (b) the environment?; only 9 out of 182 subjects (5 per cent) cited education as the single most important influence affecting their attitudes and sense of responsibility towards animals, and 25 subjects (13 per cent) cited it as the single most important influence with respect to the environment. Figures for the assessment on a scale from 0 (not at all important) to 5 (very important) of the influence of education courses on attitude to environmental responsibility are as follows **(Table 2)**:

Table 2

	number of respondents					
Assessment	0	1	2	3	4	5
School Courses	9	43	34	34	32	18
Higher Education Courses	6	36	28	36	34	30

Analysis of this assessment of influence question, as a whole, shows TV documentaries to be the most important influence overall, followed by media images, personal experience with animals and nature, nature and wildlife films and intellectual argument. Higher education courses came sixth in ranking and school-level courses ninth, out of fourteen categories of influence.

Second, a project on 'Subject and Community Knowledge in Environmental Education' aims to investigate various forms of knowledge and awareness of environmental issues possessed by undergraduate students of education. Only nineteen of an initial fifty subjects interviewed (38 per cent) said that formal education (including books and TV), as opposed to knowledge acquired informally by living and interacting in a community, was the most significant way in which they had acquired environmental understanding and concern. This seems a surprisingly low number given the background of the subjects in the study - all university undergraduates and hence successful in terms of formal education achievement.

The overall picture emerging from these various projects is both interesting and crucial to anyone with an interest in environmental education in practice. Data suggest that formal programmes in this field are indeed playing an important role, both in the development of people's knowledge and understanding of the environment and in their formulation of attitudes and feelings of responsibility towards it. Yet the influence of structured programmes is certainly not as prominent as perhaps it ought to or could be. For many people, ideas and experiences in other domains have had far greater influence upon their relationship with the environment.

Current Trends in Environmental Education Research

The studies cited above form part of a rapidly increasing and broadening global research base in environmental education. It was in the United States that the development of a research agenda in this field gained momentum during the late 1970s and the 1980s. Studies reported from this era were, on the whole, firmly rooted in the scientific research paradigm as they sought to apply quantitative methodologies to investigate such matters as the identification, prediction and control of the variables that are believed to be the critical cognitive and affective determinants of responsible environmental behaviour. It would seem that two decades after positivism and the quantitative tradition steered the definition and development of a research base for environmental education, their characteristics continue to be dominant in the research literature of today. Nevertheless, the field is dynamic and increasingly influential. Many more environmental educationists are developing a research perspective in their work, and more researchers and research students are working full-time in the field than ever before.

There is an increasing number of major funded research studies being commissioned around the world, also of collaborative studies involving partnerships between individuals and research teams at both national and international levels. Along with this trend, we see an ever-widening range of themes pursued by researchers, with increasing emphasis being placed on the links between empirical research and the improvement of practice. My comments are based on evidence from a variety of sources, including the increasing number and size of international conferences devoted to environmental education research, the increasing number of refereed academic journals devoted to the field with a growing global readership, and the continually expanding range of themes appearing within such journals.

Furthermore, the range of methodologies and approaches to research is slowly but surely broadening to take account of the all-important social context of environmental education. The number of qualitative research studies including those which are interpretative (such as those referred to above) and socially critical has increased considerably during the 1990s. Some of these are exemplary, but all too many appear to be based on methodologies that are either lacking in rigour or too poorly articulated, which raise serious questions relating to reliability and validity. Without doubt there is still a great deal to be done in terms of developing the field's qualitative research base, broadening the research base in general, and critically appraising the role of research.

Future Directions

The brief glimpse that has been provided into some of the fascinating research findings relating to significant influences on the development of people's environmental thinking gives some indication of the importance of such data for environmental educators and policy makers alike. If the single most important influence affecting people's long term concern for the environment is early experiences outdoors, interacting in and with the natural world, then surely our duty is to maximise such opportunities. Indeed, the importance of experiences outdoors, and of what might be termed spiritual and aesthetic experiences in the environment is highlighted over and over again, in data collected around the world as well as in the UK study. For example:

'The most crucial feeling in the forest is that there I feel at peace with myself, with the whole world. The wilderness seems to me like an "absolute" truth. In the wilderness I feel someone can find the real meaning of life'. (from Greece)

'As a youngster, I played in the forest open to its life and amidst that life I fell in love... but I also learned, first with my heart and later with my head, that the purpose and goals of my civilisation were different from my love. They would show me that the price of this kind of bond, this fell-sense of kinship with all life... would be spiritual violation, hurt, rage, and finally fear'. (from Canada)

'My teacher accompanied me to her residence... in the garden I came to a little chamber where I began to feel that I was in a smooth, cool, green heaven... I felt that I was moving with my close beloved ones'. (from Sri Lanka)

Elsewhere I present an argument, based on research evidence, for a shift in emphasis in the field of environmental education theory and

practice, to incorporate greater understanding of the role of aesthetic and spiritual experiences in the environment in the development of environmental awareness and concern (Palmer 1998b).

This is but one of various themes arising directly out of an empirical research base which have significant implications for future developments in environmental education. I would contend that if the global promise and potential of environmental education is to be realised in the next century, then the design and implementation of policies and programmes for learning in this critical area need to take account of such things as:

- The nature and importance of prior knowledge and of formative influences and significant life experiences impacting upon people's thinking and behaviour.
- The importance of knowledge gained through living and interacting in communities; socially acquired knowledge, as distinct from 'formal' knowledge gained in classrooms.
- The critical significance of the natural environment and 'in' the environment experiences.
- The complexity of the teaching and learning process in relation to the environment.

Illumination of these and other related matters can only come about through appropriately designed and executed programmes of reliable empirical research. With the increase in collaborative projects and international networks, environmental education research has become a well-established and extremely rewarding field in which to work; without doubt it is one which really **can** make a difference to the impact of educational experiences upon people's understanding, thinking and actions in relation to the world around them.

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▲ Resumé

Partout dans le monde, on assiste à de nombreux développements positifs dans le domaine de l'éducation à l'environnement, cependant, il reste de nombreuses questions à résoudre et des défis en perspective. En dépit de l'optimisme dans ce domaine, il est évident que l'éducation à l'environnement est loin d'atteindre son potentiel maximum. Un des défis repose sur la nécessité d'augmenter les fondements d'une recherche sur l'éducation à l'environnement et d'élargir les approches d'une telle recherche.

Cet article résume les résultats de trois recherches empiriques qui suggèrent que les programmes formels d'éducation jouent un rôle important, tant dans le développement des connaissances sur l'environnement et de la compréhension qu'en ont les gens, que dans la formulation de leurs attitudes et leurs sentiments de responsabilité vis à vis de cet environnement. Cependant, pour beaucoup d'individus, d'autres expériences comme les contacts avec la nature très tôt dans l'enfance et toute expérience personnelle de "plein air" ont eu une bien plus grande influence.

L'article résume les tendances actuelles de la recherche en éducation à l'environnement et conclut par des considérations sur les tendances et les besoins futurs.

● Resumen

En todo el mundo hay progresos positivos en el campo de la educación medioambiental, todavía ahí quedan numerosos retos. A pesar del optimismo en esta materia, es aparente que la educación medioambiental está lejos de darse cuenta de su potencial máximo. Un cambio descansa en la necesidad de incrementar la base de la educación medioambiental y diversificar los métodos de investigación.

Este artículo resume el encuentro de tres estudios de investigación empíricos que sugieren que los programas curriculares de educación están jugando un importante papel, en el desarrollo del conocimiento popular y conocimiento del medioambiente, y en la formación de aptitudes y sentimientos de responsabilidad hacia el medio ambiente. Todavía para algunos individuos, otras experiencias, especialmente las experiencias de la infancia al aire libre y otras experiencias personales han tenido una gran influencia.

Se resumen las tendencias corrientes de la investigación en educación medioambiental, y el artículo concluye con algunos puntos de vista sobres tendencias y necesidades futuras.

Dr Joy A Palmer is Dean of the Faculty of Social Sciences and Reader in Education at the University of Durham, Shire Hall, Old Elvet, Durham DH1 3HP, UK. She is also Director of the University's Centre for Research On Environmental Thinking and Awareness, and a Vice-President of the National Association for Environmental Education.

Les jardins botaniques et l'éducation pour le développement durable

Jardines Botanicos y Educacion para la Sostenibilidad

Botanic Gardens and Education For Sustainability

Education for Sustainability (EfS) is a holistic approach to education which emphasises the interrelationship of disciplines. There is high level acknowledgement of the importance of EfS. Both Caring for the Earth, (IUCN, 1991) and Agenda 21 (which emerged from the UNCED conference in 1992) clearly state that Education for Sustainability (EfS) should be the central goal of environmental education.

The origins of EfS are found mainly in environmental education (EE) and development education (DE), emphasising both environmental sustainability and social justice. Implicit, by the very nature of EfS, is that it is influenced by other 'adjectival educations', such as peace, health, political, multicultural, citizenship, human rights, futures, etc (Tilbury, 1995:200, Najda, 1993:5, UNESCO-UNEP 1992). Creating a more sustainable future (which in effect means transforming society), will require EfS to respond to change and interpret it, as well as become part of the change (Sterling, 1996).

This type of education is associated with more radical forms of education - education that enables students to deconstruct and reconstruct meaning in society. Education about sustainability, which develops an understanding of sustainability problems and new forms of sustainable management, is not enough. To challenge the dominant ways of thinking and behaving in society, which have resulted in our present state of global unsustainability, there is a need to engage in 'stronger' forms of EfS - and this means education for sustainability.

Exploring the work of botanic gardens

In attempting to gain a deeper understanding of the constraints and opportunities relating to the implementation of EfS in botanic gardens, research was undertaken with sixteen botanic gardens, using qualitative questionnaires and in-depth discussions. The gardens that participated in the research were chosen from a wide geographical spread - Africa, Asia, Latin America, North America, Australia and Europe.

The questionnaires and discussions focused on the gardens' education programmes, asking educators to define what they believed EfS to be. For each definition, a conceptual model was created to illustrate a set of linked activities logically implied by their definition (soft systems methodology, Checkland, 1984). The models were compared with the actual work of the gardens in education, noting similarities and differences between the participant's view on EfS and their work. A conceptual model for EfS was also produced by the researcher with which to compare the actual work of the gardens in education **(see below).**

Analysing and interpreting the results

Gardens' education programmes were ranked according to an 8-point checklist of activities corresponding to the researcher's conceptual map of EfS. From this ranking, it is evident that some gardens are involved in stronger forms of EfS than others. 4 of the 16 gardens (Group 1) were shown to practice weak EfS programmes; 6 gardens (Group 2) fell below the median strength; and 6 gardens (Group 3) practiced above-median strength EfS programmes, though only just.

Group 1

These gardens could be seen to provide information to their public about biodiversity through publications, lectures and guided tours. None of them, however, provided opportunities for students to discuss and debate issues or to participate in protecting the environment. This suggests that the education officers have interpreted 'increasing awareness' as information provision. All four of the gardens stated that they explore issues of biotechnology, desertification, habitat destruction, plant species extinction and trade. None of them however, explored issues of democracy, equality, gender, poverty and population control, suggesting that not only do these gardens not see it as their role to explore such issues, but that they also examine issues in isolation.

The research suggests that educators in these gardens view their role as transmitters of knowledge while students are receivers. A concern with this approach is that the gardens will be seen as the 'authority' on how to resolve environmental issues which, in effect, disempowers people from making decisions for themselves. The gardens can therefore be seen to be teaching weak EfS; in other words, education about sustainability. This is confirmed in comparing the gardens' education work with the researcher's model of EfS, in that the gardens only satisfy two areas of the model - providing information, and first-hand experience of nature.

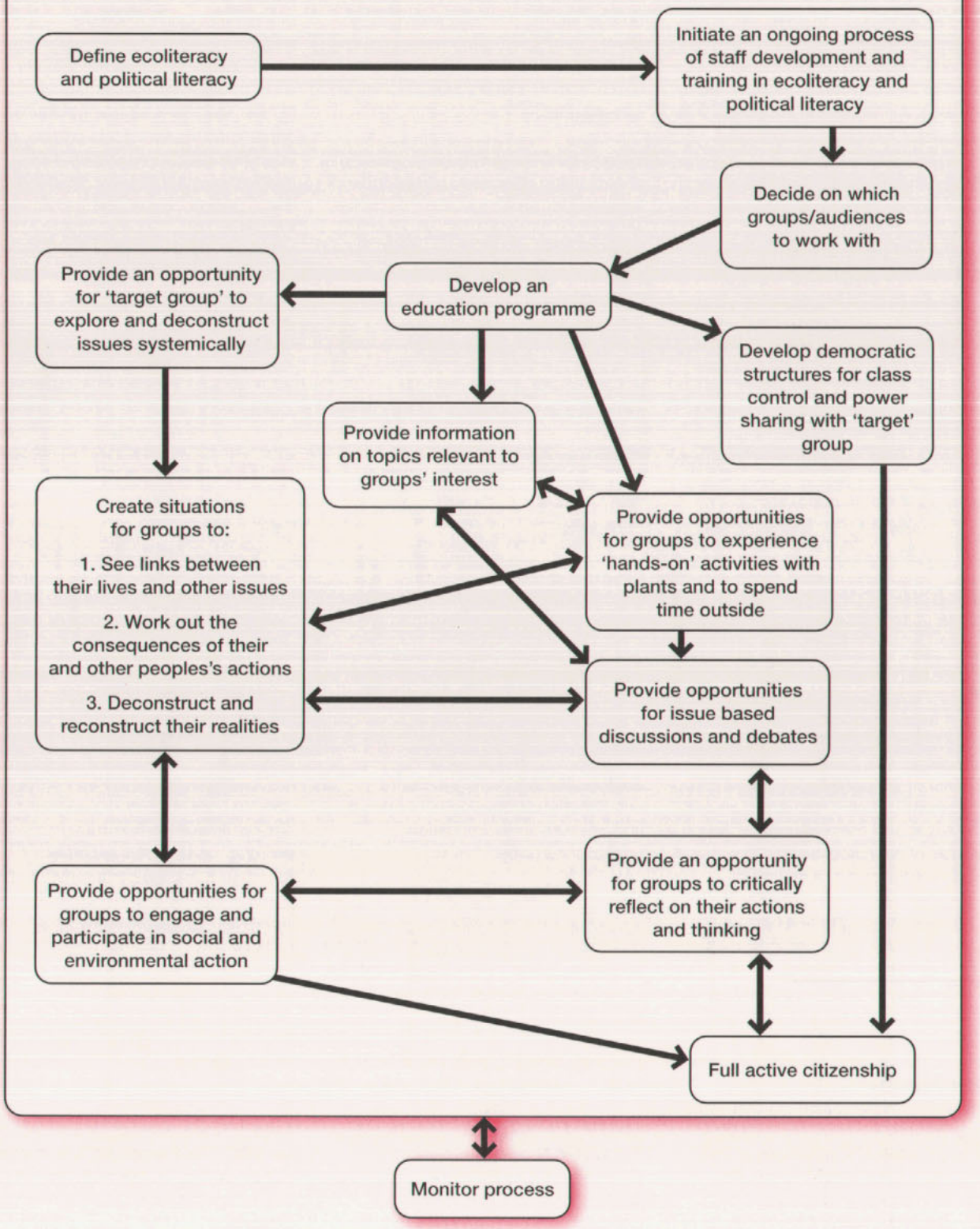
Group 2

Key words and phrases used by gardens in this group to define EfS (eg. provide awareness; develop respect and a responsibility towards other forms of life) indicate that there is an emphasis on promoting behaviour and attitude changes and encouraging people to understand the links between themselves and the environment.

It appears that the gardens in this group explored developmental issues as well as environmental issues. Several educators felt that exploring

Researcher's Conceptual Map for Education for Sustainability

The aim of EfS is to develop ecoliteracy and political literacy for full active citizenship (Sterling, 1996)



issues had more to do with the way they worked rather that what they actually taught, presenting themselves as role models. While role modelling no doubt conveys powerful messages, this highlights a concern that perhaps not all educators in Group 2 see teaching issues of equality, gender and democracy as central to EfS. Could it be that educators hope students will understand issues by picking them up subconsciously? In the researcher's model of EfS, educators are expected to create situations for students to see links between their lives and other issues.

These gardens used a wide range of teaching methodologies with their audiences, particularly experiential learning and group teaching. However, while their programmes clearly contribute to EfS through developing personal and interpersonal skills, they did not involve critical reflection. It could therefore be argued that, rather than challenging the dominant social paradigm, a taken-for-granted way in which most people view the world, they are actively supporting it. The type of education that Group 2 gardens are practicising can therefore be seen to result in weak EfS; ie. education about sustainability.

Group 3

The education programmes of these gardens come closest to the researcher's model of EfS. Similarities include:

1) The gardens actively encouraged students to make connections between their lives and other issues.
2) Three of the gardens were active in supporting 'target' groups to engage in social and environmental action.
3) Three of the gardens showed concern about developing democratic structures for class control and power sharing with teachers and students. For other gardens, the picture is more complex, as teaching styles appear to differ depending on which group of people the education officer is working with.

Conclusions

This research demonstrates that while most botanic gardens in the study practice weak EfS, a number of them are actively engaged in strong EfS. Common constraints identified by educators which inhibit the development of EfS programmes include: lack of funding, time and staff resources within education departments, as well as the lack of support by senior management. While these constraints are no doubt significant, the results of this research point to the world view of the education officer and staff as the main constraint affecting the development of EfS in a botanic garden. This suggests that to develop strong EfS programmes in botanic gardens there will need to be a radical shift in staff perceptions, values and attitudes.

Botanic gardens clearly have much to offer EfS and are ideally placed to work with their local communities to resolve environmental problems. Participatory action research, and experiential and cooperative learning, are just some of the pedagogical approaches botanic gardens can use, and are using. Considering the global environmental concerns we face, it is believed that all botanic gardens would do well to examine their programmes in light of EfS.

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▲ Resumé

Cet article rend compte des résultats d'une recherche sur les jardins botaniques et l'éducation pour le l'utilisation raisonnée des ressources (EfS). Les informations ont été collectées chez les éducateurs et le personnel de 16 jardins botaniques du monde entier, au moyen de questionnaires et d'entretiens. Les programmes ont été testés à partir d'un modèle conceptuel d'éducation à l'EfS et leurs bases philosophiques ont déterminé l'utilisation d'une trame pour une idéologie de l'éducation. Les résultats démontrent que, tandis que les 16 jardins étudiés s'emploient à enseigner l'EfS, cet enseignement dans la plupart de ces jardins n'est pas assez poussé du fait que les programmes n'apportent pas de critique de la société. On en discute les raisons et on étudie les opportunités pour que les jardins botaniques développent leur activité dans ce domaine.

● Resumen

Este artículo explica en términos generales los resultados de una investigación realizada sobre jardines botánicos y educación para la sostenibilidad (EpS). Los datos fueron recogidos por educadores y personal de dieciséis jardines botánicos de todo el mundo a través de cuestionarios y discusiones. Los programas se ensayaron con un modelo conceptual de educación para la sostenibilidad y su filosofía determinada utilizando un sistema para la ideología educacional. Los resultados demuestran, que mientras los dieciséis jardines encuestados están comprometidos a enseñar EpS, la enseñanza de EpS en la mayoría de estos jardines botánicos es floja, careciendo los programas de un elemento crítico social. Por último, se discuten las razones y se consideran las oportunidades que los jardines botánicos pueden desarrollar en este campo.

Julia Willison is Head of Education for BGCI. This research was carried out as part of an MSc programme in Environmental and Development Education.

Un coup d'oeil de chercheur sur le programme Pan-Africain "ECOSA"

Un vistazo al programa de investigación pan-africano ECoSA

a researcher's-eye view
of the ECoSA pan-African research programme

Introduction

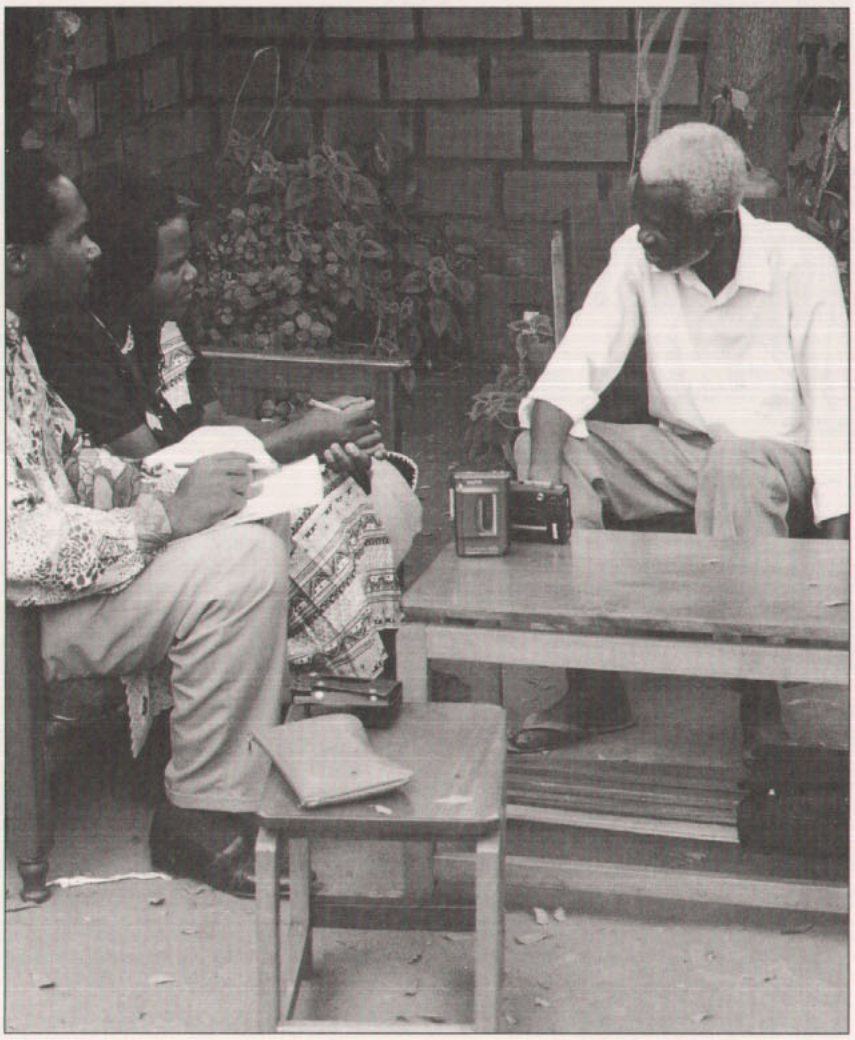
The ECoSA survey was not my first stab at research in environmental education (EE) but it was certainly the biggest research exercise in which I have been involved. In 1993 I undertook to evaluate a three year education and awareness programme in Uganda. The research tool at that time was an interview based on a structured questionnaire which was reviewed and adapted after each field visit. A hazy recollection of statistical techniques, combined with more recent observations of scientists in the field, pushed my evaluation towards a quantitative approach. Meanwhile, an intuitive view of the complex way in which people learn rang warning bells even as the first questionnaires snapped off the word processor. Such was my frame of mind on returning to the UK where I became Director of ECoSA.

The ECoSA Survey

The Education and Communication for Sustainability in Africa (ECoSA) survey was implemented by the UK-based International Centre for Conservation Education (ICCE) on behalf of the European Union. Two distinct products were to be provided:

- a report to provide an overall picture of the state of environmental education in Africa against which future priorities could be determined
- a user friendly database of organisations involved in the provision of EE in Africa.

The survey had a great deal of ground to cover and time was limited, owing to an expansion of the original Terms of Reference with no concomitant adjustment in time or budget. The research was carried out over fifteen months from May 1994 to July 1995, with a period for report writing and database editing extending into early 1996.



Interviewers Fred Kisembo and Margaret Lwanga practising their interviewing technique in Uganda

Paper or People? - Selecting the approach

The Terms of Reference prescribed the use of a questionnaire, reflecting the original ICCE proposal to produce a bank of information on existing programmes. Questionnaires are useful tools for collecting specific pieces of factual information (number of staff, duration of projects and so forth) yet the scope of the report demanded more than this. While the use of a postal questionnaire was essential in obtaining the facts for the database, I was conscious of the fact that this would not reveal the complexity of EE on the ground. What was EE anyway, and what made it different in Africa?

Listening to the experiences of people in rural and urban settings was an important part of the ECoSA survey

Certain 'Southern' non-governmental organisations are largely mirrors of their 'Northern' counterparts and government agency programmes often reflect distortions produced by donor interests as well as the influence of a colonial past. These were the very organisations who would receive and respond to our questionnaires. A paper-based survey which relied on literacy would therefore omit a large proportion of African society, particularly women. For a truly African picture we would need to talk to people.

A programme of semi-structured interviews at 'grass roots' level grew from a personal conviction that without an investigation into the way people already received environmental information and education, the survey would give an inadequate picture of the real needs of EE in Africa. Interviewers were employed and trained in Mali, Mozambique and Uganda in order to listen to the experience of people in rural and urban settings.

Despite this qualitative, field-based strand to the research (plus information gathering through country visits and a literature review), the Final Report would ultimately be written in Europe. So before submitting this to the European Union, a draft report was prepared for a consultative workshop in Africa. This was another listening exercise, giving forty African and Africa-based practitioners an opportunity to discuss the key issues raised in the report. The comments from the workshop became an essential component of the Final Report.

Lessons Learned

The lessons referred to here are those concerned with doing research rather than the official outcomes of the survey*. Perhaps the most important principle to be borne out by this experience was the value of talking with people.

We all receive questionnaires and for the most part we find them an irritation if not an infernal nuisance. Having spent years as a designer and implementer of EE in Africa, I did not feel comfortable in the role of irritant to over a thousand environmental educators across the continent; (however I was struck by the time and effort that hundreds of people did put into their questionnaire responses).

Becoming involved in research - being a builder of knowledge - led me to

think a good deal harder about what knowledge was all about. The pieces of information recorded on the questionnaires were simply that - information. My interpretation of this information would always be just that - my interpretation, no matter how many statistical gymnastics I put the numbers through. The knowledge I really gained was generated through social interaction between myself and practitioners. Indeed the roles of researcher and practitioner become blurred as both parties share in the analysis of situations.

By holding an informed conversation we can build ideas, test them against the experience of others and remould them in an atmosphere of collaboration and common interest. This is how knowledge is constructed. It is how we have done it for centuries, how knowledge has been built up and built upon in traditional societies across the continents. My principle achievement during the months of the ECoSA programme was to recognise this process as the social construction of knowledge and to un-learn the artificial rigour of the scientific method (which, as far as I can see, still holds good for studies of the physical world).

During the time of the ECoSA survey in 1995, I facilitated a workshop in Zanzibar and introduced an interview technique as a qualitative research tool. The outcome was inspiring. Simply through interviewing people in Zanzibar's Stone Town about their perception of the local solid waste problem, residents were moved to organise themselves over the issue, something which had not been achieved by years of television campaigns and wildlife club clean-ups.

This in turn has helped me to recognise a key role of environmental education, that is building in people the competence to analyse their own situations and to initiate change. The philosopher Michael Foucault seemed to be talking about the same thing back in 1977:

"What we have to present are instruments and tools
that people might find useful. By forming groups specifically to make these analyses, to wage these struggles, by using these instruments or others: this is how, in the end, possibilities open up." (Foucault 1977 in Foucault 1984)

On an immediately practical note this experience has also convinced me of the value of carrying out research before attempting to begin an EE programme. As environmental educators we must make every effort to find out what is important to people, how they perceive the world and then work towards an understanding of how we perceive the world - rather than telling them where they are going wrong. In this case 'we' can include experts from whichever environmental specialism is relevant at the time.

The task of the environmental educator is to provide the tools which can re-integrate our artificially divided disciplines. While we require a broad understanding of many issues we need not be experts in specific issues; our area of expertise is people, from taxi-drivers to taxonomists, and we should never tire of trying to discover what makes them tick.

* The ECoSA Final Report proposes a number of guiding principles and recommendations (including a more collaborative approach between donors and practitioners in developing EE programmes); these are included in a Summary Report which is available on request to Roots readers.

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▲ Resumé

Le comité pour l'éducation et la communication pour le développement en Afrique a produit un rapport sur l'état de l'éducation environnementale en Afrique ainsi qu'une base de données sur les organisations engagées dans des programmes d'éducation à l'environnement. Au départ les démarches étaient d'envoyer des questionnaires par la poste. Toutefois cette étude n'aurait rien révélé sur ceux qui dans la société sont les bénéficiaires des programmes d'éducation à l'environnement. Une approche qualitative a aussi été conduite basée sur des interviews dirigés dans trois pays: le Mali, le Mozambique et l'Uganda. Un atelier consultatif a été organisé en tant qu'exercice pour prolonger l'écoute. Les enseignements à tirer de ce progamme montrent l'importance de la communication directe comme principe pour bâtir le savoir. Cela illustre l'importance à diriger des recherches tendant à planifier un programme d'éducation à l'environnement.

● Resumen

La encuesta sobre Educación y Comunicación para la Sostenibilidad en Africa (ECoSA) realizó un informe del estado de la Educación Medioambiental (EM) en Africa así como una base de datos de organizaciones implicadas en hacer efectivos los programas de EM. La primera aproximación fue enviar cuestionarios por correo. Sin embargo, esta encuesta base no revelaría nada acerca de la sociedad que recibe los programas de EM. Se adoptó también una aproximación cualitativa en base a entrevistas semiestructuradas en tres paises (Mali, Mozambique y Uganda) y se organizó un taller de consulta. La experiencia de este programa demostró la importancia de la charla directa con la gente como medio principal de afianzar el conocimiento. Esto demuestra la importancia de llevar a cabo una investigación antes de planificar un programa de EM.

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Des lieux spéciaux pour les jeunes enfants

Lugares especiales para niños pequeños

Special Places for Young Children

How do children come to know and care about the natural world? While many would suggest that little research has been done to address this question, others would point to the professional literature on such related topics as "significant life experiences" and "ecophobia" and say that we can learn a lot from this related research. One thing which this related literature tells us is that positive place experiences play an important role in helping children learn about and appreciate the natural environment.

Presented in this article is a brief look at the professional literature relating to significant life experiences and ecophobia. Also presented are some possible implications and suggestions for environmental education, especially as provided through such nonformal education settings as nature centers and botanic gardens.

Call for More Research

The discussion in this article is not meant to suggest that sufficient research has already been done on how children come to know and care about the natural world. On the contrary, more research is definitely warranted. This need for research has been addressed repeatedly (Chawla, 1988; Simmons, 1994).

Chawla (1988), for one, calls for more concentrated research on children's experience of nature and the development of pro-environmental behaviours. To date, neither society nor the field of developmental psychology have made this a priority. In fact, as Chawla (1988) indicates, a blindness to nature as a source of more-than-material necessities is the norm. This blindness, she notes, is "reflected in developmental psychology's lack of a vocabulary, theoretical framework, or research agenda to deal with children's experience of nature" (p. 19) . Chawla wisely proposes a two-pronged response: (a) more research into how children learn to care about nature; and (b) the creation of communities which give them something to care about. Nonformal environmental education

Positive experiences in the out-of-doors during childhood is important for developing a personal concern for the environment

Cutting apples for apple sauce

Finding a special place in the natural environment

programs and settings can play an important role in each of these areas. Before providing a few suggestions as to how this might be done, a brief overview of some of the current research relating to significant life experiences and ecophobia will be presented.

Current Research Findings

Significant life experiences and related concerns.

Significant life experiences have been studied in relation to the development of environmental concern. Such studies have been conducted primarily through surveys of people engaged in environmentally-related professions (e.g. environmental educators, interpreters, etc.). A number of cross-cultural studies indicate that positive experiences in the out-of-doors during childhood represent the single most important factor in developing a personal concern for the environment (Palmer, 1993; Tanner, 1980). Other research indicates that without positive experiences in the out-of-doors, children tend to develop fears and discomforts which interfere with learning to know and care about the world of nature (Bixler, Carlisle, Hammitt, & Floyd, 1994; Hart, 1979; Kaplan, 1976; Simmons, 1994; Wilson, 1994).

One study, conducted by Wilson (1994), involved semi-structured interviews with a group of thirty three preschool children (ages three through five). Questions asked during the one-on-one interviews focused on children's understandings, attitudes, and feelings regarding various aspects of the natural environment. Children's responses were then analyzed in relation to the following six categories: fear, dislike, appreciation, caring, enjoyment, and violence. Results included more expressions of fear, dislike, and violence than of appreciation, caring, and enjoyment. Rain, for example, was referred to as something the children did not like and that could make them sick. Wild flowers were viewed as dangerous because they attract bees, which might sting. The thought of being in a boat on a small lake was also frightening to many of the children. They were afraid the boat would tip over and they'd get eaten by sharks and alligators. A number of children expressed fear and/or indicated that they'd perform violent acts if they were close to such creatures as butterflies and baby birds. Their responses included "Kill it," "Grab him and rip him apart," "Step on it," "Smash it," "Cut the birds' mouths off," and "Kick them." Misunderstandings were also common findings in relation to the children's responses. For example, only 9 of the

33 children indicated that finding wildlife in their backyard was a possibility.

Misunderstandings and expressions of fear were also noted in a study by Simmons (1994). For this study, interviews were conducted with eight nine year old children from a large urban area. Some of these children expressed fear of big trees and other vegetation (e.g., "Branches could fall off," "A tree might fall down," "Trees could get you scared," and "There might be itchy weeds"). The children also expressed fear of animals and bodies of water (e.g., "A bird could swoop down and get you," "Fish are poisonous and may bite you," "You might fall in the water and drown," "You could get hurt because there are too many rocks"). As these studies indicate, unfounded fears and misconceptions about nature tend to develop early in life. This result is not surprising, considering that most young children have very little actual contact with living things (Cohen & Horm-Wingerd, 1993) and they tend to be "more familiar with wild places through stories about witches and wild beasts than through direct experience" (Chawla, 1988, p. 15).

Sweeping up the leaves

Today, many places where young children live and play and go to school are almost devoid of vegetation and other opportunities for direct contact with nature. Playgrounds, for example, tend to be dominated by prefabricated metal and plastic equipment. Children growing up in such settings may never have the opportunity of having the kind of significant life experiences that have motivated many environmentalists to devote their lives to protecting the natural environment. An additional concern for environmental education is that once unfounded fears and misconceptions about nature develop, environmental education programs take on the role of being corrective or remedial rather than formative and are thus less effective in accomplishing their goals (Bixler, et al 1994).

Natural habitats enhance children's awareness

Frequent positive place experiences in natural areas, on the other hand, can foster attraction and respect for wildlife. These, in turn, can prove crucial to preventing or minimizing

fearful responses to natural elements (Chawla, 1988; Kellert, 1985).

Yet, as already indicated, opportunities for experiencing the natural world are decreasing at an alarming rate. Factors in both the physical and social environments of today's world seldom allow children the opportunity to freely explore and manipulate natural elements. This deprivation can lead to the development of ecophobia (Sobel, 1996) and prejudice against nature (Cohen, 1984).

Ecophobia

Indications of ecophobia (i.e. the fear of ecological problems and the natural world) were reflected in the studies previously mentioned (i.e. Simmons, 1994; Wilson, 1994). Ecophobia, for some children, extends to the fear of being outside (Sobel, 1996). To combat the malaise of this fear and other manifestations of ecophobia, Sobel (1996) suggests fostering ecophilia, that is "supporting children's biological tendency to bond with the natural world" (p. 6). Providing frequent opportunities for children to become immersed in special outdoor places is one way to support this critical bond and prevent or minimize unfounded fears of and prejudices against nature.

Creating Special Places

Special places for young children are defined in this context as safe and aesthetically pleasing natural environments where they are free to manipulate and explore various aspects of the natural world. Places that are especially appealing to children give them the opportunity to arrange and re-arrange different aspects of the environment according to their own design. Studies have indicated that the extent to which a place is special for children depends, in large part, on the extent to which children are actively involved in making it their own (van Andel, 1990). Thus, rather than developing special places for young children, we should be developing them with the children. We should provide places where they can create, change, and personalize the environment. In addition to reflecting children's inner need to influence their environment (Moore, 1989), this practice also honors children's way of coming to know and love the world of nature (Wilson, 1997).

Positive place experiences provide opportunities for children to explore, to manipulate, and to be involved with the natural environment. If the environment is limited in opportunities for exploration and involvement, the child's potential for learning in that environment is also limited. Schools, homes, and neighborhoods should provide natural habitats that nourish children's awareness and actively support their learning. Such learning occurs, not only in the cognitive domain, but in the areas of self esteem, emotional development, and aesthetic appreciation, as well (Iozzi, 1989). An additional benefit for environmental education is that positive place experiences also foster a sense of caring about the natural world (Nabhan & Trimble, 1994).

Additional Suggestions

In addition to creating special places for young children, some additional

Providing opportunities for children to become immersed in the out-of-doors can prevent 'ecophobia'

suggestions on how to help children learn to know and care about the natural world are as follows:

- Introduce children to the typical natural elements of their own environment (e.g. native plants and animals, local waterways, etc.).
- Avoid emphasizing the names or labels of all elements and ecosystems. Focus, instead, on characteristics (e.g. how does it look, how does it feel, how does it move, etc.).
- Encourage children to share their experiences of place through map making, drawing, expressive movement, creative writing, etc.
- Find ways to certify special places. To certify is to spotlight a particular place and present it to the public. Such presentations might be by way of videotapes, photographs, paintings, drawings, articles in the local newspaper, etc. It is generally understood that the arts can be especially powerful in certifying special places and, in the process, amplifying a sense of place (Olwig, 1991; Pruneau, in press). Certification tells children (and the public) that a particular place is special or important. Through certification, a place becomes legitimate or more real (Steele, 1981).

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▲ Resumé

Alors qu'on a besoin de faire davantage de recherches sur les origines de l'attirance des gens pour la nature, il semble évident que des endroits spéciaux peuvent contribuer de façon significative à la compréhension que les enfants peuvent avoir du monde qui les entoure et sur leurs relations avec ce monde. De telles expériences ont tendance à développer l'émerveillement et à intensifier la compréhension et le goût des enfants pour l'environnement naturel. De telles expériences contribuent aussi à inciter au respect pour l'environnement qui, les recherches le démontrent, est un prérequis essentiel pour agir pour l'environnement.

● Resumen

Mientras más investigación se hace para atraer a la gente al conocimiento de la naturaleza, parece claro que existen ciertos lugares que pueden contribuir significativamente a que los niños conozcan el mundo que los rodea y sus relaciones. Estas experiencias pretenden fomentar el conocimiento de los niños y su apreciación del medio ambiente natural. Esta experiencia también contribuye a sensibilizar el cuidado acerca del medio ambiente natural el cual, como la investigación indica, es un requisito esencial para la acción medioambiental.

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Jeux et activités diverses pour les enfants

Los juegos de los niños

The Games Children Play

Introduction

Environmental educators agree that respect for the environment, the teaching of values as related to the environment, and encouraging a change in environmentally responsible behavior should all be integral parts of any environmental curriculum. Environmental education may become one of the most important areas of teaching as the balance in the natural environment becomes unstable with continued destruction of vital ecosystems. Young children are eager to learn about their surroundings. This is evident as they explore, dig, collect and become engrossed with the discovery of new bugs and other organisms. Beginning environmental education as soon as a child enters school validates the concepts and discoveries they have already made. Actively involving students in their communities and in solving local environmental problems encourages them to become active at a more global level. Knowledge alone cannot influence the protection of the environment. Action is intimately related to how people value their knowledge, how much they feel they can control their surroundings, and what happens within those surroundings (Hines, Hungerford & Tomera, 1987).

Rationale for Use of Games

Games provide a means for students to become more active in their own learning while allowing all to participate (Boocock & Schild, 1968). Games encourage active and simultaneous participation and encourage learner-to-learner interactions, which are most influential on students' performance in instructional settings (Johnson & Johnson, 1980).

While content and knowledge are important components of all school programs, an occasional change in methodology may allow us to encourage those learners who otherwise might fall through the cracks. Games become an activity in which students look forward to participating, and places those who are unsure of themselves in a less threatening environment. Students become central to their own learning.

Even though the environmental movement has received much publicity in the last twenty years, public knowledge still remains low (Arcury & Johnson, 1987). Science has given us basic information about nature and its workings, and the ways in which people are intertwined with it. Teachers should now take this knowledge and convey it to the next generation, so that they may make informed choices based on these facts.

This study involved the use of six environmental games by 295 students in six elementary schools in the Midwestern region of the United States. Nine teachers agreed to pilot-test the games as part of this research. All students played three of the six games, on topics including Wetlands, Pollution, Energy, World Population, Endangered Species, and Individual Effects on the Environment. The games were designed to teach facts, influence decisions related to the topics, and in some cases describe the value of an area (such as Wetlands). Games were each designed to be played for five days, with no intervention from the teacher other than to explain rules and procedures, or clarify questions. Students were encouraged to interact and to help each other with questions and answers. This aspect encouraged less competition and more cooperation among players. The students also were taught three of the units without the games in a more traditional manner using materials readily available to teachers, either through public domain or published curriculum materials such as Project Wild, Ranger Rick NatureScope and Zero Population Growth, Inc. kits.

Students were pre- and post-tested with an instrument developed by Alan Voelker and Robert Horvat (1976) to measure environmentally responsible behavior. This was a Likert-type instrument with four possible answers; strongly agree, agree, disagree, and strongly disagree. The students' tests were scored with the most desirable answer receiving a four and the least desirable answer receiving a one. The Analysis of Covariance (ANCOVA) method was used to analyze differences between pre- and post-test scores by age, gender, and the use of games. Results indicate that the format of the lessons, i.e. games, made a difference in the change of behavior reported by boys and girls. There may be many reasons for this result, one being that boys may have been encouraged to be more competitive in similar situations. Another may be that in any typical classroom setting, boys are generally more outspoken than girls. These factors may contribute to the level of comfort felt by students playing the games.

Results also show that only four of the six games played by the students resulted in significant changes in reported environmentally responsible behavior.

Findings

The results of this study were encouraging. Students who initially had low scores on environmentally responsible behavior increased their scores significantly. The increases were, however, significant for only four of the games, and boys' scores out paced increases for girls. Games covering the topics of pollution and world population did not increase scores. This was an unexpected result, but students' comments in the margins of the questionnaire helped to clarify why these games may not have been successful. For instance, one questionnaire statement, "Couples

should not have more than two children" received many comments, showing students' beliefs that parents should have as many children as they want, and that having any number of children was a personal right for any one living in the USA. Through other items on the test, students commented that they felt the earth would soon have too many people, and that the number of people in the USA should not increase. They seemingly could not reconcile this with the former statement. Another area of concern was pollution. While the majority of students agreed that people cause most pollution, they often scratched out the "like me" in the statement "People (like me) are the cause of most pollution" before agreeing with the statement. Nobody would like to be blamed for damaging the environment. This may be typical of the adult population as a whole as well. Similar reasons could have affected the outcome of the "Individual Effects on the Environment" game.

Although the results of this study are not conclusive, they suggest several implications for teachers. The first is that games can provide a medium in which students can learn. The games however, should be ones that the teacher designs to meet the needs of his or her own classroom and should focus not only on facts but on placing value on the knowledge gained. Students should gain understanding of their importance in the overall balance of ecological systems. Secondly, children can be taught environmental topics through the use of games and significantly improve their reported environmental behavior. Thirdly, girls may need to be more involved in game playing so that they may benefit equally from this interesting and involving method of learning. This suggests that teachers allow their students to interact more in situations such as gaming so that students develop skills in cooperation and problem solving.

The purpose of this study was to try to determine the effectiveness of using games as a way to gain environmental understanding and to increase the advocacy that students feel toward the environment. The classroom atmosphere generated by playing games increases student participation in their own learning. It allows them to cooperate with each other and places less stress on getting a grade than on the actual learning. It is hoped that by learning more about the workings of the environment, students will become more aware of their contribution to the overall health of the planet on which they live.

Environmental advocacy and activism are areas of extreme importance to many environmental educators, and most would agree that this is the ultimate goal of an environmental program. By increasing the enjoyment of learning, perhaps students will be more inclined to act on the knowledge they have gained, and become actively involved in taking care of not only their immediate space but also that of the larger whole.

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▲ Resumé

Des jeux éducatifs destinés à apprendre les éléments en rapport avec des sujets environnementaux sur les zones humides, la pollution, les espèces menacées, la population, l'énergie et les influences des individus sur l'environnement ont été le thème de cette étude portant sur 295 étudiants du Midwest de 4ème, 5ème et 6ème grade. Les étudiants ont subi un pré-test et un post-test utilisant une méthode mise au point par Hovat et Voelker pour déterminer les changements dans le comportement et le sens des responsabilités face à l'environnement. On a trouvé des résultats significatifs entre les filles et les garçons et entre ceux qui ont joué à quatre des jeux et ceux qui n'y ont pas joué du tout.

● Resumen

En Midwestern se diseñaron diversos juegos instructivos para la enseñanza medioambietal. El estudio se realizó en 295 estudiantes de cuarto, quinto y sexto grado. Los temas de estos juegos fueron: Tierras Húmedas, Polución, Especies Amenazadas, Población, Energía y Efectos Individuales en el Medio Ambiente. A los estudiantes se les realizaron pruebas anteriores y posteriores al estudio usando el método de Horvat y Voelker para determinar los cambios en el comportamiento medioambiental de los estudiantes. Se encontraron resultados significativos entre chicos y chicas y entre estudiantes que jugaron cuatro de los juegos y aquellos que no jugaron ninguno.

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Les ballades champêtres et leurs activités associées

Trabajo de campo y actividades posteriores

Field Trips and Follow-Up Activities

Introduction

Field trips offered to school children are a key component of public garden educational programing. Investigations involving living museums have occurred for decades, supporting the use of field trips as educational activities. Programs that have been most successful are those that incorporate three critical elements as defined by researchers of museum education: pre-visit planning, pre-visit preparation, and object-oriented activities (Farmer 1993). Bitgood reported that "a high percentage of teachers also use follow-up activities" (Bitgood, 1989). However, very few investigations have addressed the effectiveness of follow-up activities.

Setting and subjects

Washington Park Arboretum is located in a Seattle City Park. The Arboretum's staff offers structured field trip programs to local schools, contacting 1368 students in 1992 (Robins 1993). Field trip activities for this study took place in a classroom, a plant production area, and in the park-like setting of the Arboretum's woody plant collection. Follow-up activities took place in the students' classrooms.

Subjects were 111 public school students in fourth grade classes. All students were enrolled in the same school and had completed similar course work related to plant science.

Procedures

Students were divided into three groups: the main treatment group (Treatment Group 1), the Placebo Group, and Treatment Group 2, which was a class of students with reading disabilities. Assignment of classes to Treatment Group 1 and to the Placebo group was random. Data for Treatment Group 2 were monitored and analyzed independently and included in the discussion of this paper but not in all of the statistical analysis.

Immediately prior to the field trip in the Arboretum, students received an introduction and agenda delivered by the author and the Arboretum teacher. Students were informed of the research but not of the nature of the investigation. All students completed a pre-test designed to measure understanding of subject matter of the field trip.

All students participated in a standardized orientation which was followed by a standard test used to evaluate their pre-field trip knowledge of the subject.

In the Arboretum, students hunted for plant accession tags

Field trip subject matter and activities

The lesson plan for the field trip had two components. The "Science Component" addressed seed dispersal mechanisms and plant life cycles. In the propagation and growing areas, a teacher led a discussion addressing a simplified plant life cycle: flower, fruit, seed, vegetation. Students then collected and dispersed seed by eating it, throwing sticky seeds at each other and throwing different types of seed into a stream . Each student selected a type of dispersal mechanism to draw in detail. Discussion addressed all sorts of seed dispersal including ice, airplanes, mud and insects.

The "Arboretum Component" addressed the function and mission of the Washington Park Arboretum. Students 'hunted' for ten deciphered plant accession tags. Students examined plants ready to be sold (and dispersed through commerce) and holding-beds of plants being introduced to the Arboretum. Discussion also focused on the size and type of Arboretum plant collections.

Follow-up activities

Follow-up activities were the experimental treatments for this investigation. Each experimental treatment lasted for forty-five minutes and had the same format and same sorts of activities. These included drawing, role playing, visualization and handling plant parts. The experimental treatment was as follows:

1. For Treatment Groups 1 and 2 the experimental treatment was designed to reinforce the components and learning objectives of the field trip. The lesson plan, concepts and components of the field trip were repeated and discussed in the classroom. Activities were different, though designed to emphasize the same concepts as the field trip. Treatment Group 2 also received this activity.

2. For the Placebo Group the experimental treatment addressed tools a plant scientist may use for research and did not address the concepts or subject matter of the field trip.

Table 1.
Comparisons of Post-test Total and Component Scores

Score	Placebo (n = 60)		Treatment 1 (n = 51)		
	M	SD	M	SD	P
Science component	44.2	16.0	50.6	17.2	0.05
Arboretum component	8.0	6.2	8.5	7.2	0.326

Testing instrument

Instrumentation consisted of a written short-answer test similar to the students' classroom tests. Of the eleven questions, eight questions addressed the Science Component for a possible subtotal of 81 points. Three questions addressed the Arboretum Component for a possible score of 18 points.

Pre-test scores were charted as a histogram which showed a relatively normal population. The placebo group scored higher than the treatment group (means of 44.2 and 36.4, respectively), but the difference was not signifcant. All students then participated in a standardized field trip presented by the author or a trained Arboretum teacher.

Approximately two weeks after the field trip, the author visited the placebo and treatment groups to present follow-up

As a part of the field trip, students were asked to pick their favorite mechanisms of seed dispersal, to find an example and to draw a detail of the seed.

activities. Immediately after the follow-up activity, all students completed a post-test designed to measure understanding of concepts and subject matter presented during the field trip. The pre-test and the post-test were identical.

T-tests were conducted between the post-test scores of Treatment Group 1 and the post-test scores of the Placebo Group. T-tests also were conducted between the pre-test scores and the post-test scores for each group. The pre-test/post-test control group design was used (Campbell and Stanley 1963).

Students had fifteen minutes to complete the test. The pre-test and the post-test were the same instrument. Content validity was established by two judges from the Faculty of the University of Washington School of Education. During a trial run of the investigation, a teacher from the study school (but not from the study group) reviewed and commented on the test questions and format. Local school teachers signed up voluntarily to have their students participate in the Washington Park Arboretum Field Trip program. From one school, teachers signed up over 200 fourth grade students. The superintendent, teachers and students from this school were asked to participate in the study.

Results and discussion

The results shown in Table 1 indicate a small difference between the post-test scores of Treatment Group 1 and the Placebo Group with much of the difference accounted for by the science component of the test. T-tests showed significant increases in total scores. For the two Treatment Groups, changes were highly significant ($P<.00$) and for the Placebo Group they were slightly less significant. For short-term learning, the relevant treatment follow-up activity was more effective as an educational tool than the unrelated placebo.

This supports the use of follow-up activities by educators and museum staff as well as suggestions by other researchers that follow-up activities do reinforce and solidify the concepts discussed on field trips. However, the post-test was given immediately after the follow-up activities and therefore compared short-term memory and learning for the Treatment Group with longer-term memory and learning for the Placebo Group. A post-test conducted at least a week after the follow-up activity would have given more robust conclusions but was not possible.

The increase in test scores for the Placebo Group may be accounted for by several factors, all of which assume the placebo activity had no effect on the post-test score because it did not address the test content. First, learning was a purpose of the field trip and is consistent with the increase in scores demonstrated by the Placebo Group. The implication is important, especially for the Arboretum, as it suggests that the field trip program was a successful and complete educational activity.

Second, having taken the pre-test undoubtedly focused students' attention during the field trip. Third, it is possible that students engaged in activities or discussion which

contributed to uncontrolled learning during the period between the field trip and the follow-up activity.

Implications are important for school and museum educators who are required to justify and integrate the field trip as an effective educational tool. In-class, teacher-led follow-up activities are commonly used. Follow-up activities may be more effective if led by museum teachers. Research should address the effects of this variation. Until then, the public garden staff can help the class teacher by providing field trip lesson plans and suggested follow-up activities.

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▲ Resumé

Cette étude analyse les rapports entre (a) l'apprentissage cognitif, (b) la sortie sur le terrain et (c) les activités qui en découlent. 111 étudiants du 4ème degré ont participé à un contrôle de pré-test/post-test. Trois groupes ont participé, à la même sortie sur le terrain. Deux des groupes étudiés ont suivi une activité exploitant la sortie, tandis que le groupe témoin a reçu des informations, mais pas d'activités en rapport avec la sortie. Des analyses statistiques ont été faites, comparant les résultats du post-test pour les deux groupes étudiés et les différences de score entre les trois groupes. On a observé des différences importantes entre les scores de certains post-test et entre ceux de tous les pré-test et post-test. Ces modifications ont suggéré que l'activité qui a suivi la sortie a renforcé un certain nombre de concepts abordés pendant la sortie sur le terrain.

● Resumen

En este estudio se examinó las relaciones entre (a) el aprendizaje cognocitivo, (b) el trabajo de campo y (c) las actividades posteriores. Ciento once alumnos de cuarto grado participaron en un pre-test/post-test de diseños de grupos. Tres grupos participaron en el mismo trabajo de campo. Dos grupos hicieron actividades relevantes durante la excursión, mientras que el tercero fue un grupo placebo que solo recibió información, pero no realizó ninguna actividad. Se realizaron análisis estadísticos dirigidos a comparar los resultados post-test de los dos grupos primeros y los resultados para los tres grupos. Se detectaron diferencias significativas entre algunos resultados posteriores al test con los resultados previos al trabajo de campo. Los cambios sugieren que las actividades investigadoras relacionadas refuerzan algunos de los conceptos presentados durante el trabajo de campo.

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Evaluation et recherche sont essentiels au soutien des jardins botaniques

Evaluación e investigación como clave de apoyo

37

Evaluation and Research: the Key to Support

Introduction

Do the phrases "doing more with less" or "economic rationalisation" sound familiar? For many organisations, changing times have brought increased accountability, enhanced awareness, greater competition and a need to demonstrate economic return (Stevens 1989). The funding of botanic garden operations is a major issue in today's economic climate. At times, it is visitor, interpretive and educational services that are "trimmed" when the budget is affected. This is often due to a lack of understanding by decision makers as to the role, importance and value of these services.

Management agencies need to understand the visitor and to see the botanic gardens through their eyes. A better understanding of visitors' expectations and motivations assists in ensuring community use, support and allocation of funds by being able to develop the garden's services. It is important to take into account where visitors' understanding of botanic gardens is poor and their expectations inappropriate.

To deal with economic rationalisation and "cuts", botanic garden educators and interpreters need to use evaluation and research techniques to their own advantage, as well as for the benefit of the community, the gardens and their visitors.

How Should We Approach Evaluation and Research?

Lewis (1986) considered that informal evaluation techniques were satisfactory because 'One just "knows" when one has done well ' (p. 107). Lewis's "gut feeling" approach has its limitations but, combined with more formal evaluation techniques, it allows those managing interpretive and educational services and facilities to make informed decisions on planning, management and budget allocation. It also allows those actively providing the services to achieve a balance between visitor needs and the overall mission of the botanic garden. Of equal importance, "facts and figures" help to justify the value and importance of visitor, interpretive and educational services to the major decision makers.

What's Happening in Australia?

A national survey of Australian botanic gardens in 1994 (Sutherland 1996) revealed that, although two thirds (65%) evaluated their visitor, interpretive and educational services, the most popular forms of evaluation were informal techniques such as verbal feedback, visitor comment books and visitor numbers.

These informal techniques have obvious limitations, and do not reveal information about visitors' understanding of the role of botanic gardens, their motivation for visiting, whether they learnt anything on their visit, their expectations of, or satisfaction with, services and facilities, or whether they visit regularly. All of these will affect the type of services provided, their content and the way they are delivered.

What Did Evaluation and Research Reveal in Australia's Regional Botanic Gardens?

A study conducted at Gladstone Tondoon Botanic Gardens (Tondoon) in Gladstone, Queensland, and North Coast Regional Botanic Gardens (NCRBG) in Coffs Harbour, New South Wales, set out to investigate visitors' perceptions of the roles of botanic gardens, and expectations of facilities and services. How this information can be used by botanic garden managers, educators and interpreters is summarised in Table 1.

Most visitors were motivated to visit botanic gardens for recreational opportunities and the aesthetic experience

Similarly to other botanic gardens, most visitors (71%) were motivated to visit Tondoon and NCRBG for recreational opportunities and the aesthetic experience. Few (11%) were specifically interested in plants or educational aspects.

Regardless, visitors recognised that botanic gardens had many roles. Greater than 89% thought botanic gardens had a role in each of the following:

- conserving plant species
- educating the visitor and school groups
- increasing environmental awareness of the visitor and the community
- displaying and promoting plants from the local region
- carrying out botanical and scientific research.

84% of visitors expect school group tours and activities to be provided by botanic gardens

Areas that were more poorly understood were the role of botanic gardens in educating botanists and other professionals, and displaying plants from all over the world, with a third of visitors responding they did not see these as the role of botanic gardens.

Table 1
How can Educators and Interpreters Use the Results of Their Research and Evaluation?

Types of information	Use
1. visitor demographic profile (age, place of residence, gender, level of education)	• at what age and level to target visitor, interpretive and educational services. • which types of activities to provide and the frequency, i.e. whether to repeat activities for new visitors or provide a range to cater for regular visitors.
2. expectations of services and facilities.	• determines what is necessary to interpret programs, publications and promotion to set expectations. • interpret the appropriateness and inappropriateness of certain services and facilities to botanic gardens.
3. perceptions of the roles of botanic gardens	• determines themes and topics to be addressed in visitor, interpretive and educational services and staff training requirements. • use to set direction of marketing and promotion.
4. expectations of types of plants featured	• determines themes and topics to be addressed in visitor, interpretive and educational services and staff training requirements. • of particular importance where gardens specialise in regional or native plants.
5. attitudes and motivation towards environmental issues	• determines themes and topics to be addressed in visitor, interpretive and educational services. • determines at which level to pitch the information.

Further investigation revealed that a fifth (20%) of those recognising the role of botanic gardens in plant conservation, did not think botanical and scientific research, or researching horticulture were roles. On the surface, the research findings revealed one level of information, but further investigation questioned the true understanding of, and the depth of understanding by, visitors.

Botanic gardens have a role in nurturing visitors' interest, and in encouraging them to 'act' in a conservation sense. Their challenge is to '....show how a collection of plants is inherently part of something much bigger and more complex' (Fletcher 1993, p 1). Therefore, investigating the environmental awareness of visitors is worthwhile. Visitors to Tondoon and NCRBG appeared to be environmentally aware. Most were 'very interested' in recycling, with more than three quarters considering themselves to be a 'bit active' to 'active'. Although not active in the cause, these visitors were very interested in the conservation of native plants and pest animal control. Interestingly, there was no significant correlation between gender, age or educational

qualifications, and interest and motivation in environmental issues.

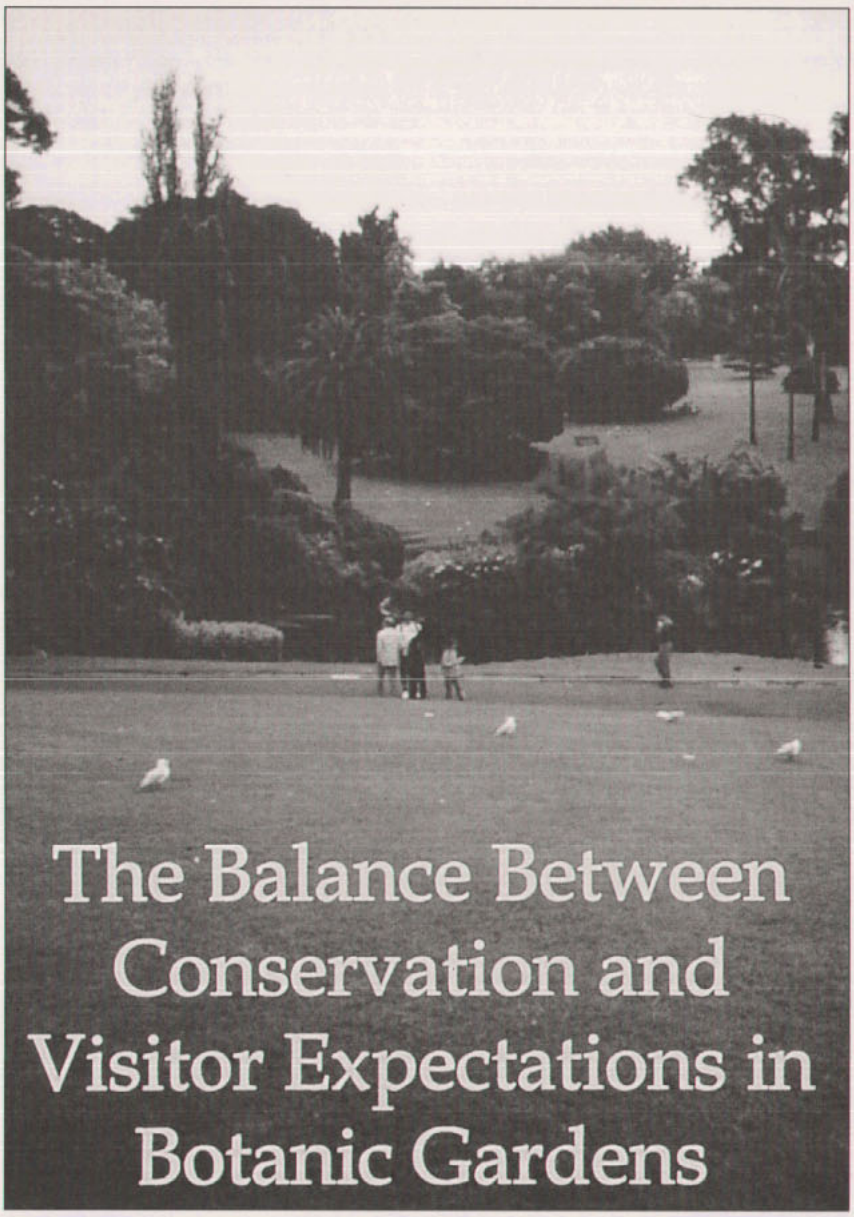
A third of Tondoon visitors and one in six visitors to NCRBG visited the botanic gardens monthly, but for one third it was their first visit.
The challenge for botanic garden managers is to target their services on several different levels, in order to provide information to the range of visitors, i.e. first time and return visitors. In addition, with the majority of visitors only staying for 1-2 hours, this challenges managers to create effective ways to provide services, and to encourage visitors to use the services in their limited time available.

Do Visitors Expect Services and Facilities?

Visitors clearly expected certain facilities and services in botanic gardens beyond those traditionally provided in an urban park. Therefore, although recreation was a primary concern, they did recognise the differences between a botanic garden and an urban park. Greater than 90% of visitors expected labelled plants, plant identification services and botanical advice and information. They placed importance on the basic facilities such as toilets and access for disabled persons, but the majority also considered that a visitor centre, children's play area, kiosk, displays and exhibits were 'important' or 'very important' in a botanic garden. They favoured facilities that enhanced the recreational and social aspects of their visit.

Although botanic gardens have an educational role, as of 1994 only 55% provide activities for schools in Australia (Sutherland 1996). However, visitors to Tondoon and NCRBG expected interpretive and educational services to be provided by botanic gardens, and 84% expected school group tours and activities. Interestingly, of those visitors who expected school activities to be provided, a quarter did not expect activities for the visitor (27%) or the local community (28%).

Providing the right facilities offers opportunities for visitors to appreciate and enjoy other aspects of the gardens. It also enables educators and interpreters to use these 'visitor hot spots' to convey the garden's messages in fun, creative ways.



The Balance Between Conservation and Visitor Expectations in Botanic Gardens

More than 89% of visitors recognised that botanic gardens had a role to play in plant conservation

Discussion

Communities are very mindful of where their tax and rate money is spent. Many botanic gardens rely on community rate payers, and their financial support, to maintain their operations and key roles. Community support is essential. Differing perceptions and expectations can create problems for botanic garden managers, and dissatisfaction for visitors. A clear vision by management, accompanied by community understanding and acceptance of this vision, can ensure ongoing community use, support and funding.

Therefore, undertaking research and conducting evaluation can lead to an understanding of the community's perceptions of the roles of botanic gardens and their expectations of services and facilities. These provide important base line information from which to develop and manage visitor, interpretive and educational services. The information can also be used to achieve a balance between visitor needs and expectations and the mission of the botanic garden. An understanding of visitor use, and who the visitors are, can allow managers to organise their operation to maximise interpretive potential, by presenting those messages which the garden is in the best position to communicate (Burbidge 1990). This leads, hopefully,

to increased visitor understanding, public support and resource allocation.

' Without community support the fate of any botanic gardens will be bleak '
(Morley 1992, p77)

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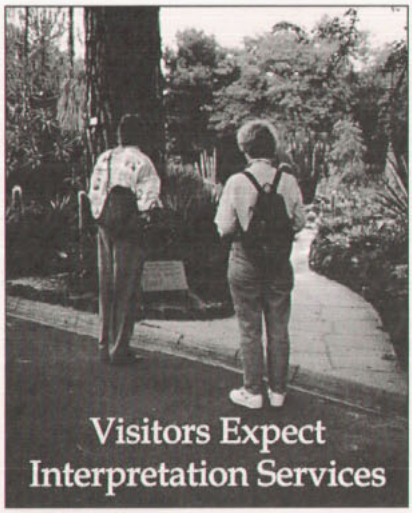
▲ Resumé

Est-ce que les expressions "faire plus avec moins" ou "rationalisation de l'économie" sont familiers? Le temps qui passe a apporté une augmentation des responsabilités, une plus grande prise de conscience, une compétition plus importante et un besoin de démontrer un retour économique (Stevens 1989). Les fondements des actions des jardins botaniques sont un sujet important dans le climat économique actuel. De temps en temps, ce sont les services de visites, d'interprétation et d'éducation qui sont "élagués" quand le budget est établi. C'est souvent du à un manque de compréhension de la part des décideurs quant au rôle, à l'importance et à la valeur de ces services. Les responsables du "management" ont besoin de comprendre les visiteurs et de voir les jardins botaniques à travers leur regard. Une meilleure compréhension des attentes et motivations des visiteurs aide à assurer une bonne utilisation du jardin par le public et à justifier l'attribution de fonds en étant capable de développer des services dans le jardin. Il est important de prendre en compte les aspects du jardin botanique mal compris par les visiteurs et les points où leurs attentes sont insatisfaites. Pour tenir compte d'une rationalisation économique et des "coupes" dans les budgets, les éducateurs et animateurs des jardins botaniques doivent utiliser les évaluations et les recherches, tant pour eux mêmes que pour le bénéfice de la collectivité, des jardins et de leurs visiteurs.

● Resumen

¿Le suenan familiares las frases: "Hacer más por menos" o "Racionalización económica"? Los tiempos cambiantes han traído un incremento de la responsabilidad, de la conciencia, más competencia y la necesidad de demostrar un cambio económico (Stevens, 1989). Las operaciones de los fondos de los jardines botánicos es una importante cuestión en el clima económico de hoy. A veces, es el visitante, los servicios de interpretación y educación los que se recorta cuando se ejecuta el presupuesto.Esto es debido a una falta de conocimiento, por parte de los que toman la decisión, de la importancia y valor de tales servicios. Los gestores necesitan conocer al visitante y ver los jardines botánicos a través de sus ojos. Un mejor conocimiento de lo que esperan los visitantes y la ayuda motivada asegurando el uso comunitario, apoyo y fondos de cuotas serán capaces de desarrollar los servicios del jardín botánico. Es importante considerar que áreas del jardín son deficientes, en opinión de los visitantes, para no crear expectativas inapropiadas.

Para hacer frente a la racionalización económica y a los recortes, los educadores de jardines botánicos necesitan técnicas de evaluación e investigación para su propio provecho, además de para el beneficio de la comunidad, los jardines y sus visitantes.



Visitors Expect Interpretation Services

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"Green Teacher" est un magazine d'éducation à l'environnement qui offre le meilleur programme pédagogique pour l'éducation à l'environnement et au développement, et l'éducation au développement durable. Cette publication se veut être à la pointe de l'enseignement, démontrer l'importance d'aborder les sujets qui traitent d'environnement, d'aider les professeurs, et les personnes qui préparent les programmes éducatifs par la stimulation des idées et des méthodes pédagogiques pour arriver à une appréciation plus intégrée et holostique de leur travail. Publié 3 fois par an, en anglais seulement, le magazine offre un grand nombre d'articles et d'activités, et recense également les ressources disponibles.

Reviving links - Des liens renoués. Expériences d'éducation à l'environnement des ONG, et participation du public aux politiques d'environnement.
Van Hemert, M., Wiertsema, W., and Van Yperen, M., Both ENDS, Damrak 28-30, 1012 LJ Amsterdam, The Netherlands, Tel:31.20.6230823. Fax: 31.20.6208049. Email: bothends@gn.apc.org

Cette publication, très compréhensible, recense les expériences conduites par différentes organisations non gouvernementales (ONG) dans le domaine de l'éducation à

● recursos

Este Servicio está financiado por la Comunidad Europea y por el Overseas Development Administration.

Maestro Verde
Randle, D. (Ed) Green Teacher Co-operative Ltd., Swn y Mor, Pen yr Angor, Aberystwyth SY23 1BJ, UK. Tel: 01970 626478. Email: djr28@tutor.open.ac.uk

Green Teacher es una revista de educación ambiental que destaca lo mejor en la práctica del curriculum para el medio ambiente y el desarrollo de la educación y la educación para la conservación. La publicación pretende estar a la vanguardia en cuanto a los esfuerzos que se realicen, para dar un significado a los temas ambientales, así como el apoyo a los profesores y promotores de los planes de estudio, estimulando ideas y métodos para lograr una estimación del trabajo más integrada y holística. Esta revista publicada tres veces al año y sólo en Inglés, ofrece una rica variedad de artículos, actividades, consejos y recursos.

Reviving links - Experiencias de las Organizaciones No Gubernamentales (ONG) en la educación ambiental y participación pública en las políticas ambientales.
van Hemert, M., Wiertsema, W., and van Yperen, M., Both ENDS, Damrak 28-30, 1012 LJ Amsterdam, THE NETHERLANDS, Tel: 31.20.6230823. Fax: 31.20.6208049. Email: bothends@gn.apc.org

Esta publicación analiza las experiencias de varias organizaciones no gubernamentales (ONG) en el campo de la educación ambiental. Los modelos se presentan para apoyar la planificación y el desarrollo de los programas de Educación Ambiental. La publicación expone la importancia de la colaboración en el desarrollo de las actividades de Educación Ambiental. Estudios determinados muestran como la educación motiva, informa y ayuda a la sociedad.

■ resources

Fax: (44-171) 586 4866.
Email: tve-uk@tve.org.uk
URL: http://www.oneworld.org/tve

TVE have produced a new European catalogue, with the support of the European Commission. The catalogue reviews 55 films and videos on environmental topics made by European producers and directors. There is also a section listing programmes which TVE offers to organisations across Europe wanting to use film and video as part of their awareness-raising efforts. The catalogue is available in English, French, Italian and Spanish.

Create a School Wildlife Garden: an interactive teaching package for developing school grounds

Turner, S (Ed), London Wildlife Trust, 80 York Way, London N1 9AG. Tel: (44 171) 278 6612. Fax: (44-171) 837 8060. UK£7.95 + p&p.

This teaching package has been designed to involve primary children in plans to develop their school grounds. It is based on the planning-for-real concept and may be used to develop improvement programmes or as class projects. The pack considers care and maintenance issues as well as curriculum links.

Free Information Service

To register contact the NF-2000 coordinators, CPL Scientific Ltd, by email: nf-2000@cplsci.demon.co.uk or via the World Wide Web: http://www.nf-2000.org.

The NF-2000 Network provides information about Non-Food Agro-Industrial Research and Development activities in Europe. The subject matter covers raw materials (sugar, vegetable oil, starch, fibre, wood, etc) and technology for the manufacture of a wide range of end products including fuels, polymers, composites, paper, pharmaceuticals, bulk and fine chemicals. It also covers some aspects of energy crops and decentralised electricity generation. NF-2000 is funded by the European

▲ lectures

l'environnement. Les directives sont présentées pour faciliter l'organisation et l'exécution des programmes d'éducation à l'environnement. La publication aborde l'importance de chercher des collaborations pour la réalisation de programmes d'éducation à l'environnement. Les études de cas permettent de montrer comment l'éducation motive, informe et structure la société.

Catalogue Européen des films sur l'environnement

Television Trust for the Environment (TVE), Prince Albert Road, London NW1 4RZ (UK) Tel: (44-171) 586 5526. Fax: (44-171) 586 4866.
Email:tve-uk@tve.org.uk
URL: http://www.oneworld.org/tve

TVE a réalisé un nouveau catalogue européen, avec l'aide de la Commission Européenne. Le catalogue recense 55 films et vidéos sur l'environnement réalisés par des producteurs et des realisateurs européens. Ce catalogue comporte aussi une section qui liste les programmes que TVE offre aux organisations européennes qui veulent utiliser des films et des vidéos pour effectuer leur travail de sensibilisation. Ce catalogue est disponible en Anglais, Français, Italien, et Espagnol.

Créer un jardin naturel dans l'école : un dossier pour développer le jardinage à l'école

Turner, S (Ed), London Wildlife Trust, 80 York Way, London N1 9AG. Tel: (44 171) 278 6612. Fax: (44-171) 837 8060. UK£7.95 + p&p

Ce dossier est destiné à impliquer les enfants de maternelle dans la réalisation des plans de leur jardin d'école. Le principe est de respecter réellement le plan des enfants dans la réalisation du jardin, et pour l'utiliser dans le cadre des programmes d'amélioration ou des projets de classe. Le dossier prend en compte les questions de soin et de maintenance, de même que les relations avec d'autres programmes scolaires.

● recursos

Catálogo Europeo de Películas Ambientales

Television Trust for the Environment (TVE), Prince Albert Road, London NW1 4RZ (UK) Tel: (44-171) 586 5526. Fax: (44-171) 586 4866.
Email: tve-uk@tve.org.uk
URL: http://www.oneworld.org/tve

TVE ha producido un nuevo Catálogo Europeo con el apoyo de la Comisión Europea. El catálogo contiene 55 películas y videos sobre temas medioambientales realizados por productores y directores europeos. Contiene también un sección de los programas que TVE ofrece a las organizaciones de Europa que utilizan películas y videos como parte de sus programas de concienciación. El catálogo está disponible en Español, Inglés, Francés e Italiano.

Create a School Wildlife Garden: una carpeta educativa interactiva para el desarrollo de las bases escolares.

Turner, S (Ed), London Wildlife Trust, 80 York Way, London N1 9AG. Tel: (44 171) 278 6612. Fax: (44-171) 837 8060. UKÉ7.95 + p&p

Esta carpeta educativa ha sido realizada para implicar a los alumnos de primaria en los planes de desarrollo de su base escolar. Está basada en la planificación de un concepto real que puede utilizarse para desarrollar programas o como proyectos de clase. Tiene como finalidad el cuidado y la conservación de los resultados así como su vinculación al plan de estudios.

Servicio de Información Gratuito

La Red NF-2000 proporciona información sobre las actividades de Investigación y Desarrollo (I+D) Agro-Industrial en Europa. El contenido trata sobre las materias primas (azúcar, aceite vegetal, almidón, fibra, madera, etc.) y la tecnología para la manufactura de amplio rango de productos finales entre los que se destacan combustibles, polímeros, compuestos, papel, productos farmacéuticos y refinados químicos.

■ resources

Commission (EC) and information items are provided free of charge.

ELECTRONIC RESOURCES

Surf the net with WWF-UK
http://www.wwf-uk.org

WWF-UK's new site has an area dedicated to schools and community educators. It includes news, on-line resources on environmental issues, an education conference room for on-line debate on environmental education, and much more.

'World Environment News' - A Free Service
http://www.planetark.org

The Reuters news agency and Planet Ark have combined forces to offer a free global environmental news service. Once you have registered at the Planet Ark homepage, daily world environment news headlines are sent

▲ lectures

Un service d'information gratuit
Pour s'inscrire contacter the NF-2000 coordinators, CPL Scientific Ltd, by email: nf-2000@cplsci.demon.co.uk or via the world wide web:http://www.nf-2000.org

Le réseau NF-2000 donne des informations sur la recherche et le développement en agro-industrie non alimentaire en Europe. Le sujet couvre principalement les matières premières (sucre, huile végétale, amidon, les fibres, le bois ect...), et les technologies pour la fabrication d'un grand nombre de produits finis comme le fuel, les polymères, les matériaux composites, le papier, les produits pharmaceutiques, la chimie lourde et fine. Il traite également de quelques aspects de l'exploitation des bio-carburants, de la production décentralisée d'électricité. NF-2000 est financé par la Commission Européenne, et les informations sont diffusées gratuitement.

● recursos

También trata algunos aspectos de la producción de energía y el descentralizado de la generación eléctrica. NF-2000 está financiado por la Comunidad Europea y la información es gratuita.

ELECTRONIC RESOURCES

Navega con WWF-UK
http://www.wwf-uk.org

WWF-UK tiene una nueva página dirigida a escuelas y comunidades de educadores, Educación y Comunidad. Incluye noticias, recursos en linea de temas medioambientales, debates sobre educación medioambiental y muchos temas más.

Noticias medioambientales del mundo. Un servicio gratis.
http://www.planetark.org

La agencia de noticias Reuters y Planet Ark han realizado un gran esfuerzo para ofrecer un servicio de noticias medioambientales gratis. Una vez que te has registrado en la página de Planet Ark, diariamente te enviarán titulares mediambientales a tu correo electrónico. Como la mayoría de las noticias medioambientales ocupan poco espacio en la prensa tradicional, este es un excelente camino para estar informado. También hay una seleccion de software medioambiental gratis para llevártelo. Planet Ark es una fundación Medioambiental no lucrativa con sede en Sydney, Australia que suministra información medioambiental.

La Página de BGCI
http://www.rbgkew.org.uk/BGCI

La Dra. E. Martín-Consuegra de Córdoba (España), voluntaria en el BGCI, ha construido la página del BGCI. En esta página encontrará información actualizada acerca del trabajo en el BGCI, incluyendo noticias, congresos y proyectos. Esta página tiene conexiones a las páginas de los jardines botánicos miembros de la organización. Si su jardín no está conectado desde el BGCI, mándenos

■ resources

directly to your email number. Since many environmental news stories are given little coverage in the traditional press, this is an excellent way to keep informed. There is also a selection of free environmental softwear to download. Planet Ark is a non-profit Foundation based in Sydney, Australia which concentrates on providing the information needed to enable people to live environmentally aware lives.

BGCI Homepage
http://www.rbgkew.org.uk/BGCI

Dr Quety Consuegra-Martin, a BGCI volunteer from Córdoba in Spain, has set up a BGCI home page. It gives frequently up-dated information about the work of BGCI, including news, congress developments and projects. The BGCI home page also has extensive links to the homepages of member gardens. If your garden would like to be linked to the BGCI home page, please let us know. We would also welcome your garden creating a link from its web site to the BGCI home page.

▲ lectures

INFORMATIONS SUR LE NET

Surfer sur le net avec le WWF du Royaume-Uni
http://www.wwf-uk.org

Le nouveau site du WWF du Royaume-Uni a une plage consacrée aux écoles et à leurs éducateurs. Il comprend des nouvelles, des brèves concernant l'environnement, un espace de dialogue consacré à l'éducation environnementale, et bien d'autres choses.

World Environment News' "des Nouvelles de l'Environnement de la Planète" un service gratuit
http://www.planetark.org

L'Agence Reuters et Planet Ark ont uni leurs forces pour offrir un service gratuit de nouvelles sur l'environnement de la planète. Une fois que vous êtes inscrit sur la page de Planet Ark, des nouvelles quotidiennes sur l'environnement de la planète sont envoyées directement à votre adresse Internet. Depuis que beaucoup de nouvelles concernant l'environnement sont données sous forme de flashes dans la presse traditionnelle, c'est un excellent moyen pour se tenir informer. C'est aussi un choix de logiciel gratuit sur l'environnement. Planet Ark est une fondation à but non lucratif basée à Sydney en Australie, qui rassemble les informations nécessaires pour rendre les individus capables de vivre avec l'environnement en connaissance de cause.

La page web du BGCI
http://www.rbgkew.org.uk/BGCI

Le Docteur Quety Consuegra-Martin, un bénévole au BGCI de Cordoue en Espagne a créé une page BGCI. On y trouve fréquemment les dernières informations sur le travail du BGCI, y compris des nouvelles, le déroulement des congrès et les projets. La page du BGCI a aussi des ramifications jusqu'aux pages des jardins membres. Si votre jardin souhaite se connecter à la page du BGCI, faites-nous le savoir. Tous jardins souhaitant établir un lien entre son propre site et la page du BGCI seraient les bienvenus.

● recursos

un e-mail con su localización para establecer la conexión. Agradeceriamos a todos nuestros jardines botánicos miembros que también incluyeran una conexión de nuestra páginas en su web.

focus on networks

■ networks

Australian Association for Environmental Education (AAEE) has approximately 900 members, with members in each state and territory. Members of AAEE come from widely varied professions and are involved at all levels, from policymaking to delivery. They include educators from:

- schools
- local, State and Federal government
- industry
- universities
- technical and further education
- botanic gardens, zoos, museums, parks and reserves
- field study centres
- community and conservation groups.

AAEE seeks to promote environmental education by;

- publishing a newsletter, journal, occasional papers and reports;
- running professional development conferences and seminars locally and Australia-wide;
- networking between environmental educators;
- co-operating with conservation organisations and other groups;
- lobbying governments to support environmental education within government agencies;
- offering an annual travelling scholarship
- undertaking consultancies

AAEE conducts biennial National conferences which have looked at themes such as urban environmental education, arid lands, thinking and acting environmentally, linking with the community, world heritage - vision and values. The most recent conference,

▲ networks

L'Association Australienne pour l'Education à l'Environnement L'Association Australienne pour l'Education à l'Environnement (AAEE) possède environ 900 membres, répartis dans tous les états et sur tout le territoire. Les membres de l'AAEE viennent de professions extrêmement variées, et sont impliqués à tous les niveaux. Cela inclut des éducateurs venant :

- des écoles
- du gouvernement local, d'Etat ou Fédéral
- de l'industrie
- des universités
- des formations techniques et supérieures
- des jardins botaniques, zoos, muséums, parcs et réserves
- de centres d'étude de la nature
- de groupes communautaires et de conservation.

L'AAEE cherche à promouvoir l'éducation à l'environnement par:

- la publication d'une lettre d'information, journal, communiqués occasionnels et rapports
- l'organisation pour les professionnels de conférences et séminaires sur le développement, à l'échelle locale ou de l'Australie toute entière
- l'organisation de réseaux entre les éducateurs de l'environnement
- la coopération avec les organismes de conservation et autres groupes
- la pression exercée sur les gouvernements, pour qu'ils appuient l'éducation à l'environnement à l'intérieur d'organismes gouvernementaux
- l'attribution d'une bourse de voyage annuelle

● networks

Asociacion Australiana para La Educacion Medioambiental La Asociación Australiana para la Educacion Medioambiental (AAEE) tiene 900 miembros aproximadamente, en cada estado y territorio. Los miembros que forman esta asociación abarcan un amplio rango de profesiones y niveles, desde políticos hasta educadores. Incluyendo estos últimos profesionales de:

- Escuelas
- Gobierno Federal, Estatal y Local
- Industria
- Universidades
- Educación Técnica y Suplementaría
- Jardines Botánicos, Zoológicos, Museos, Parques y Reservas
- Centros de Estudios
- Comunidades y Grupos Conservacionistas

AAEE busca promover la educación medioambietal a través de:

- Publicaciones en hojas informativas, periódicos, publicaciones ocasionales y reportajes.
- Conferencias profesionales y seminarios locales en toda Australia
- Redes de trabajo entre educadores medioambientales
- Cooperación con organizaciones conservacionistas y otros grupos
- Gobiernos locales que apoyen la educación medioambiental dentro de las agencias gubernamentales
- Financiar una beca anual de viaje
- Compromisos coherentes

AAEE organiza conferencias Bianuales de carácter Nacional en la que tratan temas como la educación medioambiental urbana, tierras áridas, pensamiento y acción medioambiental, lazos con la comunidad, la herencia del

■ networks

Earthlinks, was held in Hobart, Tasmania in January 1997.

All members receive a quarterly newsletter, ozEEnews, which provides information about environmental issues, reviews of books and resources, notices and reports of conferences and meetings.

Contributions to the newsletter are welcomed and should be sent to: ozEEnews, PO Box 64, Lindfield, NSW 2070, Australia.

The Australian Journal of Environmental Education is also published by AAEE. The journal is an annual professional publication presenting ideas to stimulate debate about educational activities, enhancing environmental awareness and promoting social action. Articles include research reports, project evaluations, teaching techniques, essays on policy and philosophical issues, literature reviews and debates. If you wish to contribute to the journal contact the editor, Richard Smith, Australian Journal of Environmental Education, 22 Willsmore Street, Beverley, South Australia 5009.

For further information about AAEE and for membership details contact: Greg Allen, AAEE Secretary, Department of Environmental Protection, Westralia Square, 141 St Georges Terrace, Perth WA 6000, Tel: (08) 9222 7001; Fax: (08) 9322 2850;
e-mail: greg_allen@environ.wa.gov.au

▲ networks

• l'entreprise d'actions à long terme

L'AAEE organise des conférences nationales biennales qui ont des thèmes tels que l'éducation à l'environnement urbain, les milieux arides, penser et agir pour l'environnement, les relations avec le public, le patrimoine mondial - vision et valeurs. La dernière conférence Earthlinks s'est déroulée à Hobbart, en Tasmanie, en Janvier 1997.

Tous les membres reçoivent une lettre d'information trimestrielle, ozEEnews, qui fournit des informations sur les parutions traitant de l'environnement, des analyses de livres et de ressources, des notices et rapports de conférences et meetings.

Les contributions à la lettre d'information sont bienvenues et doivent être envoyées à: ozEEnews, PO Box 64, Lindfield, NSW 2070, Australia.

Le Journal Australien d'Education à l'Environnement est aussi publié par l'AAEE. Ce journal est une publication annuelle pour les professionnels présentant des idées pour stimuler le débat sur les activités d'éducation, augmentant la prise de conscience de l'environnement et faisant la promotion d'actions sociales. Les articles incluent des rapports de recherche, des projets d'évaluation, des techniques d'enseignement, des essais sur des questions de politique ou de philosophie, une revue de littérature et des débats. Si vous souhaitez contribuer au journal, contactez l'éditeur, Richard Smith, Australian Journal of Environmental Education, 22 Willsmore Street, Beverley, South Australia 5009.

Pour plus d'informations sur l'AAEE et sur l'adhésion, contactez : Greg Allen, Secrétaire de l'AAEE, Department of Environmental Protection, Westralia Square, 141 St Georges Terrace, Perth WA 6000. Tel : (08) 9222 7001; Fax : (08) 9322 2850;
e-mail: greg_allen@environ.wa.gov.au

● networks

mundo - visión y valores. Su última conferencía "Conexiones de la Tierra" (Earthlinks) se celebró en Hobart (Tasmania) en Enero de 1997.

Todos los miembros reciben una hoja informatica cuatrimestral, ozEEnews, en las que se proporciona información de temas medioambientales; revistas de libros y recursos, noticias y reportajes de conferencias y reuniones. Pueden enviar sus contribuciones para la hoja informativa a la siguiente dirección: ozEEnews, PO Box 64, Lindfield NSW 2070 Australia.

AAEE también publica la revista Australian Journal of Environmental Education. Esta revista es una publicación profesional anual en la que se exponen ideas para estimular el debate sobre las actividades educativas, se aumenta la conciencia medioambiental y se promueve la acción social. Los artículos incluyen reportajes de investigación, evaluación de proyectos, técnicas de enseñanza, ensayos políticos y temas filosóficos, análisis literarios y debates. Si desea contribuir a la revista contacte con el editor: Richard Smith, Australian Journal of Environmental Education, 22 Willsmore Street, Beverley, South Australia 5009.

Para más información sobre AAEE y para hacerse miembro, contactar con: Greg Allen, AAEE Secretary, Department of Environmental Protection, Westralia Square, 141 St Georges Terrace, Perth WA 6000. Tel: (08) 9222 7001. Fax: (08) 9322 2850.
e-mail: greg_allen@environ.wa.gov.au

Written by Andrew Smith, Manager - Community Partnerships, Parks and Wildlife Service, GPO Box 44A, Hobart 7001, Tasmania, Australia.

48 contact board

Anybody with a camera that can be adjusted to take both close-up and distant objects and that they can donate to the Vumba Botanical Garden, Zimbabwe, would be greatly appreciated. Private Bag V7472, Mutare, Zimbabwe.

Medicinal Plants Directory - call for contributions

BGCI is currently compiling a directory of work being undertaken by botanic gardens worldwide for the conservation of medicinal plants. If you would like the work of your garden to be featured in this directory please write to Fiona Dennis, Projects Officer at BGCI or email:frd bgci.rbgkew.org.uk.

Julia Willison, Head of Education at BGCI, would be grateful to receive slides illustrating gardens' educational programmes to use in lectures, presentations and courses. Especially helpful would be sets of 4-5 slides showing education programmes in progress, especially action shots. Good images from the Education Congress would also be welcome! Please send the slides directly to Julia at BGCI, Descanso House, 199 Kew Road, Richmond, Surrey, TW9 3BW, U.K.

Thanks to all who have sent copies of their organisation's education materials to the BGCI education resource library. Educators from many countries visit the library every year, and welcome the opportunity to review a broad range of resources in this valuable collection. Please send copies of any educational material you have produced to BGCI, Descanso House, 199 Kew Road, Richmond, Surrey, TW9 3BW, U.K.

Prague Botanical Garden is developing a programme for less able persons, especially those who are visually impaired, and would like to make contact with other European botanic gardens with experience in this field. They would also be grateful for information about other institutions (museums, zoos, etc) which have successful programmes for disabled persons. Contact: Jarmila Skruzná, Prague Botanical Garden, Nádvorní 134, Prague 7 - Troja 171 000, Czech Republic. Tel: 0042 2 688 0667. Fax: 00 42 2 688 1 502.

Designed by

Watermark

Communications

Group Ltd

Editors: Ailene Isaf and
Julia Willison.

BGCI would like to thank the co-editors for their help in the production of Roots.

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Juan Manuel López Ramírez, Jardín Botánico Canario 'Viera y Clavijo' y BGCI Canarias, Gran Canaria, Spain y Dr. Enriqueta Martin-Consuegra.

For the French Section:
Philippe Richard, Jardin Botanique de la Ville de Bordeaux, France; Gaud Morel, Jardin des Plantes de Paris, Muséum National d'Histoire et Naturelle, France; et
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