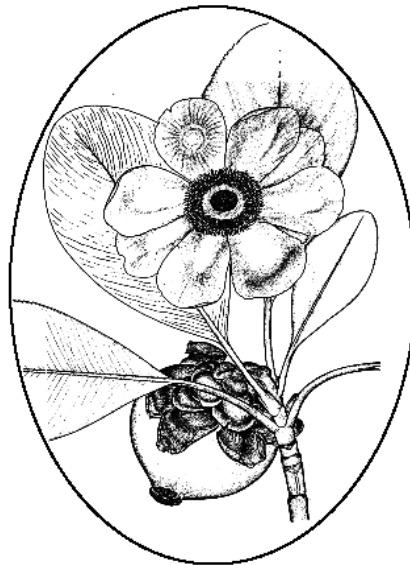


THE BIODIVERSITY OF GUYANA: A global perspective for the future

A symposium dedicated to
Dr. George L. Walcott



Georgetown, Guyana
October 7 - 10, 2001

PROGRAM

Hosted by the
University of Guyana
and the
Smithsonian Institution's Biological Diversity of the Guianas Program



DR. GEORGE LLOYD WALCOTT
(December 20, 1928 – March 20, 2001)

Born December 20, 1928 to Ms. Iona Tull and Mr. Donald Walcott. Attended St. George's Primary and Alleyne High Schools in Georgetown. He passed the Cambridge School Certificate Examination at age 14 with exemption from London Matriculation. He excelled most notably in English and Latin.

After a decade (1949-1959) of teaching at the High School level he went to London in 1959 where he enrolled in the Degree programme in Chemistry at Sir John Cass College, University of London. He received his B.Sc (Chemistry) degree in 1963 and commenced postgraduate studies thereafter. He was awarded the M.Sc degree in 1965 and the PhD in 1967. During his doctoral studies he was a Part-time Demonstrator in Chemistry for undergraduate students of his alma mater.

Dr. Walcott formally commenced his long and distinguished service to higher education on January 1, 1968 as a Lecturer in Chemistry at the University of Guyana. He was appointed Head of the Department of Chemistry in 1970 and promoted Senior Lecturer on October 1, 1971. Dr. Walcott earned the distinction of indefinite Tenured Lecturer on January 1, 1974.

During 1980-1982, Dr. Walcott served as Acting Vice-Chancellor and Chairman of the Committee of Deans as well as Deputy Vice-Chancellor and Vice-Principal. He was appointed Principal on January 1, 1983, a position he held until October 15, 1991 when he retired as the longest serving Principal and Vice-Chancellor after Dr. Dennis Irving's stewardship.

His administrative qualities were further recognised with his appointment as Assistant Dean of Natural Sciences for the 1970-71 academic year during which period he moved rapidly to become Acting Dean and substantive Dean of Faculty on September 1, 1979. He was Acting Chairman of the Committee of Deans (in the absence of the Vice-Chancellor), Chairman, Research & Publications Committee as well as Chairman of the Senior Administration Committee during 1979/80 academic year.

Aside from his distinguished service to the University of Guyana, he served in various capacities:

Chairman, National Science Research Council
Chairman, Science and Technology Sub-Committee of the Guyana National Commission for UNESCO
Member, Board of Directors, Guyana Forestry Commission (1979-1998)
Chairman, TROPENBOS-Guyana National Committee
Location Co-ordinator, TROPENBOS-Guyana Programme
Deputy-Chairman, Guyana National Equivalency Board of Educational Qualifications
Member, Board of Directors, Demerara Woods Limited
Member, Advisory Committee, Energy Education CARICOM
Member, International Research Group on Wood Preservation
Member, Executive Committee of the Association of Caribbean Universities and Research Institutes (UNICA)
Member, Governing Council of the Foundation for ACP/EEC Cultural Cooperation
Member, Board of Directors, Guyana Pharmaceutical Corporation
Member, Advisory Committee of the Regional Centre for Higher Education in Latin America and the Caribbean (CRESLAC)
Member, Rotary Club of Georgetown
Chairman, Omai Gold Mines Tailings Pond Spillage Disaster Committee
Chairman, Guyana Teaching Service Commission
Member, National Biodiversity Advisory Committee 1994-1998

Dr. Walcott was instrumental in the establishment of the Centre for the Study of Biological Diversity at the University of Guyana. The Centre is a collaborative effort between the Smithsonian Institution and the World Wildlife Fund-Canada. He was also instrumental in the University's involvement in the "Flora of the Guianas" Programme as well as the collaborative effort with Utrecht University and the European Union which gave birth to the Environmental Studies Unit, a first for Guyana.

For his distinguished service to education he was awarded Guyana's 3rd highest honour – The Cacicque Crown of Honour in 1986, and the Venezuelan Gold Medal in 1992.

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The University of Guyana
and
The Biological Diversity of the Guianas Program
of the
Smithsonian Institution

Presents

THE BIODIVERSITY OF GUYANA:
A global perspective for the future

Opening Reception at
Ocean View International Convention Centre
Liliendaal, Georgetown, Guyana
Sunday, October 7, 2001
7:00 – 9:00 p.m.

Speaker: Dr. James Rose, Vice Chancellor, UG

THE BIODIVERSITY OF GUYANA:

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Monday, October 8

Morning session:

Plenary Speaker:

9:00 – 9:45

Major General (ret'd) Joseph Singh, Conservation International-Guyana. The importance of biodiversity in national development

Invited speakers:

10:15 – 10:35

Thomas Hollowell, Smithsonian Institution, Washington, D.C.
The mangroves at Shell Beach, Guyana

10:35 – 10:55

H. David Clarke, University of North Carolina-Ashville, North Carolina. Plant diversity of Guyana: a regional perspective based on collections data

10:55 – 11:15

Terry Henkel, Duke University, North Carolina
Ectomycorrhizal basidiomycetes associated with *Dicymbe* (Caesalpiniaceae) in the Pakaraima Mountains of Guyana

11:15 – 11:35

Ramesh Lilwah, EPA – Guyana
Podotemaceae (Angiosperm): Recent collections in Cuyuni, Mazaruni, and Essequibo Rivers, Guyana

11:35 – 1:00

LUNCH BREAK

Afternoon session:

Plenary Speaker:

1:00 – 1:45

Dr. John Terborgh, Duke University, North Carolina
Planning for the future: Building a protected areas system

Invited speakers:

2:15 – 2:35

Raquel Thomas, Iwokrama International Rain Forest for Conservation and Development.
Fruits and Agoutis: A study of fruit fall in Central Guyana

2:35 – 2:55

Dr. V.A. Funk, Smithsonian Institution, Washington, D.C.
Estimating biodiversity in Guyana

2:55 – 3:15

Neils Raes, Tropenbos – Guyana Program
The identification of climber species based on vegetative characteristics and wood slashes.

3:15 – 3:35

Donna Sheppard and Donald Gunraj, Calvary Zoo, Canada and Guyana Zoological Park
The Guyana and Calvary sister zoo project: Partners in wildlife conservation.

3:35 – 3:55

Carol L. Kelloff, Smithsonian Institution, Washington, D.C.
Kaieteur National Park: balancing conservation and ecotourism

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Tuesday, October 9

Morning session:

Plenary Speaker:

9:00 – 9:45

Dr. Godfrey Bourne, University of Missouri-St. Louis, Missouri
The role of a small NGO, CEIBA Biological Centre, in understanding linkages between human activity and biological diversity in Guyana

Invited Speakers:

10:15 – 10:35

Burton Lim and Mark Engstrom, Royal Ontario Museum, Canada
Biodiversity and conservation of mammals in Guyana

10:35 – 10:55

Mark Engstrom and Burton Lim, Royal Ontario Museum, Canada
Mammals of Guyana

10:55 – 11:15

Brice Noonan, The University of Texas at Arlington, Texas
A molecular approach to conservation in the Guianas: an anuran example

11:15 – 11:35

H. David Clarke, University of North Carolina-Ashville, North Carolina
Biogeography

11:35 – 11:55

Graham Watkins, Waldyke Prince (presenter), Deirdre Jafferally, Christopher Chin, Rewa Village, Fairview Village, Apoteri Village, Crashwater Village and the North Rupununi District Development Board
Population status of the Black Caiman (*Melanosuchus niger*) in the North Rupununi Wetlands, Guyana

11:55 – 1:00 LUNCH BREAK

Afternoon session:

Plenary Speaker:

1:00 – 1:45

Dr. Andre Chanderbali, University of Guyana
On the Origin of Guianian Lauraceae

Invited speakers:

2:15 – 2:35

David Singh, EPA – Guyana
Identification of the sources and assessment of the levels of mercury contamination in the Mazaruni basin in Guyana, in order to recommend mitigation measures

2:35 – 2:55

Graham Watkins, Deokie Arjoon, Deirdre Jafferally (Presenter), Waldyke Prince, Toka Friends of the Environment Club, Toka Village, Massara Village, Yakarinta Village and the North Rupununi District Development Board
A Collaborative Study of White-tailed Deer (*Odocoileus virginianus gymnotus*) Populations in the North Rupununi Savannas, Central Guyana

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Tuesday Afternoon Session (con't), October 9

2:55 – 3:15

Phillip Da Silva, Head, Department of Biology, University of Guyana
Involving students in biodiversity studies

3:15 – 4:00

POSTER SESSION

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Wednesday, October 10

Morning session:

Plenary Speaker:

9:00 – 9:45

Dr. I Ramdass, National Wildlife Survey, EPA - Guyana
Implementation of CBD and CITES Conventions in Guyana.

Invited speakers:

10:15 – 10:35

Neville Waldron and Dick Rice, Conservation International – Guyana A global feature: CI in the Guianas, CI in Guyana with highlights on the proposed Kanuku Mountains Protected Area and the Conservation Concession.

10:35 – 10:55

Neville Waldron and Dick Rice (continued)

10:55 – 11:15

Susan Stone, Conservation International – Washington, DC
Involving communities in development.

11:15 – 11:35

RAP Team
Preliminary results from the RAP of the Kanuku Mountains area.

11:35 – 11:55

Conservation International – Guyana
Introduction to the Priority Setting Process

11:55 – 1:00

LUNCH BREAK

Afternoon session:

Plenary Speaker:

1:00 – 1:45

Dr. Kathryn Monk, Iwokrama International Centre for Rain Forest Conservation and Development
The search for alternative methods of forest conservation and development.

Invited speakers:

2:15 – 2:35

John C. Caesar, University of Guyana
Biodiversity Prospecting: opportunities for development in Guyana

2:35 – 2:55

Jackie Arjoon and Deirdre Jefferally
(to be announced)

2:55 – 3:15

Annette Arjoon, Guyana Marine Turtle Conservation Society
Community involvement in sea turtle conservation

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Wednesday Afternoon Session (con't), October 10

3:15 – 3:35

Leandro Castello, Graham Watkins, Waldyke Prince (presenter), Rewa Village, Fairview Village and the North Rupununi District Development Board
Arapaima (*Arapaima gigas*) Management and Conservation in the North Rupununi Wetlands

BRIEF ANNOUNCEMENTS

CLOSING REMARKS

THE BIODIVERSITY OF GUYANA:

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POSTERS

- Azeez, Bibi Shabana (Dr. S.D. Sithu, Supervisor). University of Guyana. Impact of a few physical factors that affect sporulation/toxin production of the mosquito larvicidal bacteria, *Bacillus thuringiensis* subsp. *israelensis* on bacterial growth.
- Banki, Olaf. Netherlands Committee for IUCN. The Guiana Shield Initiative: building the foundations for ecological and financial sustainable development in the Guiana Shield eco-region.
- Chin, Christopher J. (with assistance of villagers from Hotoquai, Hobodeia and Sebai Village). Iwokrama International Centre for Rain Forest Conservation and Development. Survey of forest understorey avifauna in north west Guyana.
- Clarke, H. D., V.A. Funk and T. Hollowell. Smithsonian Institution. Comparative floristic diversity of the Iwokrama Reserve, Guyana.
- Coddington, Jonathan A., Gustavo Hormiga, Ingi Agnarsson, Matjaz Kuntner and Jeremy Miller. Smithsonian Institution. Spiders in Guyana: Extraordinary Diversity in a One Hectare Plot
- David, Keith, T. Hollowell and Robin Ally. University of Guyana. Butterflies of Guyana: Assessing the impacts of light gaps on their diversity.
- Grose, Susan and Richard G. Olmstead. University of Washington. Phylogenetic analysis of Creseentiae and *Tabebuia* s.l. (Bignoniaceae)
- Haynes, Lakeram & Christopher Chin. Iwokrama International Centre for Rain Forest Conservation and Development. The Auditory Point Count Method (APC) - A Monitoring Tool For Birds In The Iwokrama Forest.
- Henkel, Terry W. Duke University. Ectomycorrhizal basidiomycetes associated with Dicymbe (Caesalpiniaceae) in the Pakaraima Mountains of Guyana"
- Hollowell, Thomas. Smithsonian Institution. Mangrove Forest of the Waini Peninsula, Guyana: Impacts of El Niño-related fires of 1998.
- Jafferally, Deirdre. Iwokrama International Centre for Rain Forest Conservation and Development. Reproductive seasons in insectivorous and frugivorous bats in north and south-central Guyana
- Kalamandeen, Michelle. University of Guyana. The effects of timber harvesting of reptilian populations.
- Kelloff, Carol L. Smithsonian Institution. Forest composition and structure on the Potaro River Plateau, Guyana

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POSTERS (con't)

- Kress, W.J., L.M. Prince and K.J. Williams. Smithsonian Institution. Plant classifications and a new phylogeny of the gingeres (Zingiberaceae): a spicy tale of paraphyly.
- Lawrence, Lana (Dr. Srinivas D. Sithu, supervisor). Smithsonian Institution. Effect of a few media related factors that affect sporulation/ toxin production of the mosquito larvicidal bacteria, *Bacillus thuringiensis* on bacterial growth
- MacCulloch, Ross, Any Lathrop and Carter Cox. Royal Ontario Museum. Amphibians and reptiles of Mount Ayanganna, Guyana.
- McPherson, Tsitsi Y. Smithsonian's Research Training Program. Phylogenetic analysis of *Rebinea Razowski* and *Ehachna Razowski* (Lepidoptera: Tortricidae: Euliini)
- McPherson, Tsitsi (Mr. D. Barnard and Mr. P. Da Silva, Supervisors). University of Guyana. The impact of seasonal variation in rainfall on moth abundance and diversity – preliminary results.
- Prince, Linda M. and W. John Kress. Smithsonian Institution. Species boundaries in *Canna* (Cannaceae): evidence from nuclear ITS DNA sequence data
- Prince, Waldyke, Calvin Barnard, Deidre Jafferally, Farana Alli, Leslyn Vandenberg and Neneeka Taylor. CSBD, University of Guyana. Shorebirds survey of Almond Beach.
- Reid, Yana R. and Ron Heyer. Smithsonian's Research Training Program. Analysis of advertisement calls in the genetically diverse frog *Leptodactylis fuscus*.
- Roopsind, Indranee. University of Guyana. Fish consumption by the giant river otter (*Pteronura barziliensis*) in the Rupunumi River.
- The Shell Beach Wardens, Lakeram Haynes, Chris Chin, and Deirdre Jafferally. Iwokrama International Centre for Rain Forest Conservation and Development. Reviving Conservation in the North West region of Guyana: Shell Beach Environmental Education Program
- Smithsonian Institution's Biological Diversity of the Guianas Program. Documenting the avian diversity of Guyana - a seven year overview.
- Strong, Mark T. Smithsonian Institution. An electron microscopy study of the outer pericarp surface of achenes (fruits) of *Rhynchospora* (Cyperaceae) in the Guianas.
- Tamessar, M., T. Hollowell, V. Funk. University of Guyana. Vertebrate diversity in Guyana.
- Topalov, Katarina and Vicki Funk. Smithsonian's Research Training Program. Evaluation of plant diversity on the Guiana Shield.

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POSTERS (con't)

Williams, Kyle J., W. John Kress and Paul S. Manos. Smithsonian Institution. Appendages do matter: a preliminary Phylogenetic analysis of tribe Globbeae (Zingiberaceae) based on ITS sequence data.

Wright, Kristin A. and Barth W. Wright. University of Illinois. An ecological comparison of two primate communities on either side of the Essequibo River, Central Guyana.

A Report on the Symposium

**THE BIODIVERSITY OF GUYANA:
A Global Perspective for the Future**
Dedicated to Dr. George L. Walcott (1928-2001)

Georgetown, Guyana
7 – 10 October 2001



Report prepared by V. A. Funk, C. L. Kelloff, and Tom Hollowell, Biological Diversity of the Guianas Program, NMNH, Smithsonian Institution (www.mnh.si.edu/biodiversity/bdg).
Issued: 27 December 2001

The symposium “THE BIODIVERSITY OF GUYANA: A Global Perspective for the Future” was held in Georgetown, Guyana from 7 – 10 October 2001. It was co-hosted by the University of Guyana (UG) and the Smithsonian Institution’s Biological Diversity of Guianas Program (BDG). For many years institutions and research organizations in Guyana and around the world, including the Smithsonian Institution, have been working in Guyana collecting plant and animal data, discussing conservation strategies, and evaluating areas for preservation. Two years ago the Centre for the Study of Biological Diversity (CSBD) at UG and its collaborators decided that the time had arrived to evaluate the level of our knowledge of the biodiversity of Guyana and to use those data to address question such as “What do we know about the diversity of various groups of organisms in Guyana?”, How does the diversity compare regionally and globally?”, “How can it be conserved?”, and “How might conservation efforts affect the people of Guyana?”.

Preparation for the Symposium

The symposium was originally scheduled for March of 2001 but was rescheduled for October because of a conflict with the Guyana national elections. Preparations for the meeting began well in advance. In early 2000 the Centre of the Study of Biological Diversity, UG, and the Smithsonian Institution’s BDG program submitted a proposal to the Guyana EPA and permission was granted to have a symposium. A steering committee was set up that included the CSBD, UG, BDG, the Iwokrama International Centre for Rain Forest Conservation and Development (Guyana), Conservation International-Guyana, the Tropenbos Programme, and the Guyana EPA. However, as time went by and other duties interfered, it fell to the CSBD (UG: Philip DaSilva and Dyantie Naraine) and the BDG program (Carol Kelloff) to do most of the work.



The goal of the symposium was to evaluate how much we knew about the biodiversity of Guyana and to encourage and facilitate the expression of opinions on various issues. The symposium was open to all interested parties, international as well as local. The committee decided to include plenary talks, invited talks, and posters and hoped that this design would encourage the participation of Guyanese from the academic and conservation communities as well as policy makers from the Government of Guyana, the international agencies, and representative of the Amerindian communities. There were five main themes or sessions that were to be developed: biodiversity of plants, biodiversity of animals, indigenous use and management of biodiversity, conservation and sustainable development, and ethnobotany. Over 400 letters and flyers were sent out to scientists, institutions, and organizations notifying them of the symposium and informing them of the website. This mailing had to be repeated again to notify potential

participants and speakers of the postponement and new dates. In addition, we sent several emails to all individuals in our directory.

A Symposium website was developed to provide basic information on the symposium, including location, dates, schedule, contact information, housing and restaurants, and a local map of Georgetown (www.guyana2001.org). The website also allowed visitors to register and submit the abstract for their poster or talk on-line. Although AIBS was contracted to development and maintain the website it became necessary for the BDG Data Manager to make the changes to the html file and submit the changes to AIBS. This expedited the process and the website was updated as new information became available.

The committee invited plenary speakers to address specific topics and they were carefully selected to “launch” each session. Unfortunately, a few of the international participants who were planning to attend in March had to cancel when the meeting was delayed. Invited speakers were nominated by members of the scientific community and



the poster session was available to all applicants. One reason for having a scientific meeting in Georgetown was to provide the opportunity for students and young developing scientists to attend and contribute their research to the meeting. The poster session gave them the venue to do this. The only difficulty was that although there are many computers in Guyana with the appropriate software to design posters, there was no large format printer available for use

by the students. Tsitsi MacPherson, a final year student at University of Guyana who had attended the RTP program at the Smithsonian’s National Museum of Natural History, worked with the students in preparing their posters. Eventually the poster files were emailed to Tom Hollowell (BDG data manager) and he checked the format, corrected errors, and coordinated the printing. After printing, the posters were laminated to protect them from the moisture and salt spray present in Georgetown. We received a better than expected response for posters and the staff of the Office of Imaging, Printing & Photographic Services was most helpful in assuring that we made our plane flights with posters in hand. In exchange, BDG purchased paper and ink for the NMNH printer.

The committee decided to have a logo for the symposium and selected an illustration of a pair of birds perched on a savanna shrub which was based on collections from Guyana. Unfortunately, because the birds were not yet reported in the literature, we were unable to use them. Instead, we agreed upon an illustration of the flowering plant *Clusia grandiflora* Splitg. (Clusiaceae). The logo was printed on the folders, programs, post cards, and other material; all printing was done by the BDG program staff.

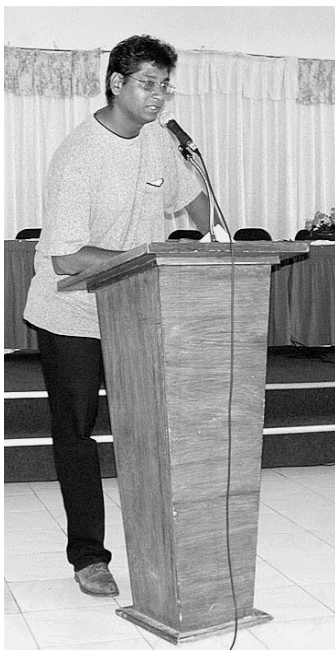


The BDG office prepared a draft of the program that was sent to all the speakers for review and comments. After adjustments were made to accommodate speakers' schedules, the final version was printed. A folder was prepared for each participant that included the program, postcards, pen and paper, information on the BDG program and on UG. In addition, we added flyers and other information provided by Iwokrama, the Centre for the Study of Biological Diversity, the NMNH Department of Botany, and the Association for Tropical Biology.



The Symposium

The Symposium opened with a Reception on Sunday night which Dr. James Rose, Vice Chancellor, University of Guyana, Mr. Ronald Godard, American Ambassador to Guyana, and Dr. V.A. Funk, Director, Biological Diversity of the Guianas Program welcomed over 200 guests. The meeting was dedicated to Dr. George Walcott (1928-2001), former Vice Chancellor of UG. Dr. Walcott was instrumental in helping the BDG program get started and was always dedicated to excellence. Dr. Rose provided a



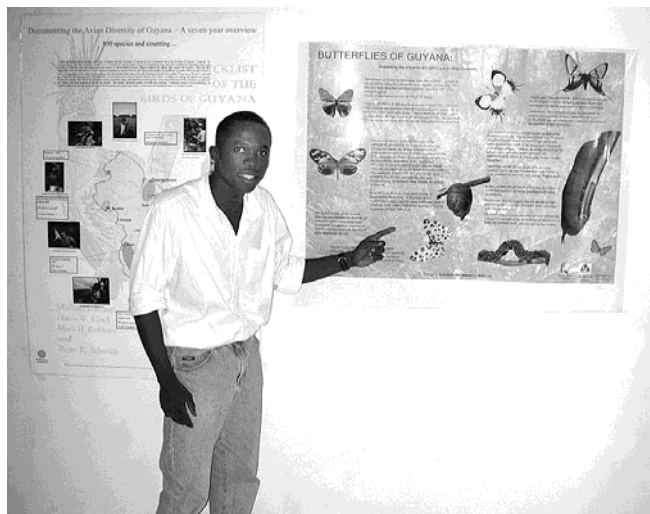
delightful account of Walcott's life and welcomed the participants. The Ambassador expressed greetings from the United States and spoke highly of the BDG program and UG. Dr. Funk thanked both UG and the US Embassy; stating that without these two institutions, the BDG would not be able to function in Guyana. Funk also announced the publication of the "Preliminary Checklist of the Plants of the Guiana Shield, Volume 1: Acanthaceae – Lythraceae." This collaborative publication expands the previous checklist (Checklist of the Plants of the Guianas) so that it now covers a natural area. Funk also pointed out the other publications that are now available both in hard copy and on the BDG website including a Checklist of the Birds of Guyana, a Checklist of the Mammals and one of the Herpetofauna. The program was filmed for local television.

Each day of the symposium was broken down into two sessions: morning and afternoon. Each session began with a plenary speaker followed by invited talks. Over the course of the meeting there were six plenary speakers: Major

General (ret'd) Joseph Singh, Conservation International – Guyana; Dr. John Terborgh, Duke University; Dr. Godfrey Bourne, University of Missouri at St. Louis; Dr. Andre Chanderbali, University of Guyana; Dr. I. Ramdass, National Wildlife Survey, Guyana EPA; and Dr. Kathryn Monk, Executive Director, Iwokrama International Centre for Rainforest Conservation and Development (Guyana). Approximately 200 people registered for the symposium and approximately 100 attended each session. The participants included staff from Conservation International – Washington, DC and Guyana, Iwokrama International Centre for Rain Forest Conservation and Development, Guiana Shield Initiative – Surinam, students from the University of Guyana and Queen's College (high school), NGO's, Ambassadors and embassy staff, and individuals from various agencies of the Government of Guyana as well as a few of the general public.

All of the talks were informative and greatly appreciated, however, the biggest attraction at the meeting was the posters. There were over 30 displayed and they were put in place before the reception on

Sunday evening. The guests spent a good deal of time examining them. The posters were submitted by scientists from the Smithsonian, the Royal Ontario Museum, the Guiana Shield Initiative, and students and recent graduates from the University of Guyana, Iwokrama, and conservation organizations. The posters were left in Guyana and are on display at the Centre for the Study of Biological Diversity, University of Guyana. They will also be available as teaching aids to the



University and surrounding schools. A publication is planned that will include all posters and talks presented at the symposium. This was the first scientific meeting held in Guyana in recent memory and although we encountered a significant number of obstacles we all agreed it was a wonderful opportunity for the scientists to present their data and discuss ideas for future work. In particular the young scientists in Guyana were excited about meeting and talking with scientists from around the world.

On Thursday following the close of the meeting a luncheon was hosted by Ambassador and Mrs. Godard at the Ambassador's residence. Representatives from the Government of Guyana, the conservation community, the academic community, and the Smithsonian attended and it was a fitting close to a hectic but invigorating few days.

Acknowledgements

The primary sponsor of the meeting was the Park Foundation, Inc. and we gratefully acknowledge their support. Other assistance was provided by National Museum of Natural History - ADRC Office, the Biological Diversity of the Guianas Program, and the Centre for the Study of Biological Diversity, University of Guyana. We thank all of these institutions, without their efforts the symposium would not have been possible. In addition, we were greatly assisted by numerous individuals: Dyantie

Naraine, Naseem Nasir and Rohnie Singh, from the Centre for the Study of Biological Diversity (UG) and the Centre Manager, Phillip DaSilva; the Smithsonian's NMNH office of Office of Imaging, Printing & Photographic Services; Tsitsi McPherson and Keith David (students, UG); Samantha James and Graham Watkins at Iwokrama; Margaret and Malcolm Chan-A-Sue; Vice Chancellor James Rose and John Caesar, University of Guyana; Ambassador and Mrs. Ronald Godard, Judes Stellingwerf and other staff members at the American Embassy; the Guyana's Environmental Protection Agency, and many others.