

Caribbean Outreach – A Special Project

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As a result of colonial heritage, the English-speaking Caribbean lacks a tradition and culture in science and technology. In the pre-independence era of most of the islands, science and technology were not considered critical elements of primary and secondary curricula. Since, at that time, our economic horizons did not extend beyond the production of primary products, education, as a whole, did not have as its major aim, the preparation of citizens with the skills and confidence to work towards the elimination of the client-dependant status.

With political independence, industrial development and a greater understanding of the relationship between socio-economic development and scientific and technological competence, there is growing recognition in the region that our human resources must be trained to keep pace with scientific and technological development. This is essential if the region hopes to survive and prosper in an age of liberalisation and industrial competitiveness. It has become imperative, therefore, that Caribbean countries develop a culture and social attitude in which science and technology is an integral part, as well as, a culture of innovation, the prerequisites of which include continuous learning, problem solving and the creation of new knowledge.

Outside of the formal education system, science popularisation activities play a vital role in achieving the objective. Science popularisation activities require financial resources, a commodity that is scarce in many Caribbean countries.



Members of the audience for the 1999 Caribbean Youth Science Forum.



Members of the National delegation to the 40th International Youth Science Forum 1998 served on the planning committee of CYSF and acted as hosts.

The National Institute of Higher Education, Research, Science and Technology (NIHERST) founded the NIHERST/NGC National Science Centre with funding from the National Gas Company of Trinidad and Tobago. The centre was formally opened on 1 February 1998, using 16,000 square feet of rented warehouse space. Prior to its opening, it existed, for about six years, as a travelling exhibition called Yapollo (an Amerindian word meaning to discover) using a container which housed thirty interactive science exhibits, all built locally. The exhibition also included a star lab. The Yapollo Science Exhibition was shown at a number of venues including school halls and shopping malls in Trinidad and Tobago. With the formal opening of the science centre, Yapollo finally obtained a much-needed home that could welcome the population, not only on special occasions, but continually.

International agencies have played a key role in initiating and supporting science popularisation programmes in the region. NIHERST, as the Caribbean leader in science and technology popularisation activities, applied for and received financial support for funding a number of science popularisation projects. This paper addresses one of these activities that was developed and executed as an outreach activity of the National Science Centre.

Caribbean Youth Science Forum – 1999

This project was fully funded by the Organization of American States (OAS). Experts in the field of Science and Technology along with 124 students representing 12 countries in the Region met at the first-ever fully funded Caribbean Youth Science Forum (CYSF) from 2-6 August, 1999. The Forum hosted by NIHERST was held at the University of the West Indies, St. Augustine campus, Trinidad and Tobago.

Countries represented were Antigua, Bahamas, Barbados, Dominica, Grenada, Guyana, Jamaica, St. Kitts, St. Vincent, Suriname (five participants each), St. Lucia (seven participants) and Trinidad and Tobago (67 participants). Members of the national delegation to the 40th International London Youth Science Forum 1998 served on the planning committee of CYSF and acted as hosts.

Forum objectives

The Forum sought to:

- ◆ Develop innovative informal approaches and strategies to strengthen Science and Technology education in the Region
- ◆ Foster co-operation among Caribbean countries in Science and Technology popularisation

- ◆ Encourage the pursuit of careers in Science and Technology
- ◆ Promote interaction with regional and international scientists.

Forum programme

In order to achieve the Forum objectives, the following activities were planned and executed:

- Plenary lectures

The Joy of Discovery and the Power of Scientific and Technological Knowledge to Reform the World around us

Dr Eric Jolly

In his lecture, Dr Jolly had this to say “What is the joy of discovery? For me, it is the recognition of the power that you have to control your own life and influence the world around you, to improve the communities you live in and to give back to society. It is the liberation from ideas, from technologies and science that allow us to improve our world.”

This quote was taken from Dr Jolly's opening remarks. He developed this by building his presentation around the prelude to Donald McCarto's

book entitled “Literacies Of Power”. He stated: “...the next literacy of power, the next literacy of control and the next literacy of influence is that of science and technology. As you come here today, you are beginning a journey in which you are developing your leadership for this new literacy. A literacy in which all communities must be versed”.

Dr Jolly stated and cited how technology is used as a powerful tool to regulate the boundaries between people since it can be designed to include or exclude. He noted that these boundaries are controlled by those who are skilled in scientific and technological fields. In this regard, drawing on his experience as a person of Native American origins and having worked with minorities, he stressed that learning and meaning should not be individualistic. Contextual learning according to Dr Jolly, is powerful because it extends the capacity of the



Dr Eric Jolly

learner to influence their world, to integrate new knowledge and to contribute to the collective wisdom of the community.

He concluded that our goal today is not to worship science and technology, but to tame it and bring it into the lives of our community, to find a way to give it meaning. As such, it is important to break the boundaries of formal education by creating community programmes which enliven people with the knowledge that they already are scientists, mathematicians and technologists. Against the background, he called upon participants to exercise their power by asking questions to form the issues of science, to inform the direction and development of science and to create debate.



Dr Jeffrey Dellimore

The Business of Science

Dr Jeffrey Dellimore

One of the concerns in the Caribbean is that many of our outstanding students are not selecting science for study beyond the form three level. Business subjects are the major competitors. Two main reasons are offered:

- ◆ It is easier to gain good grades in business subjects
- ◆ Business graduates earn much better salaries than science graduates

In addressing this concern, Dr Dellimore stated that:

- ◆ The essence of science is more than application of the “scientific method”. It is also an attitude that creates a relentless search for new knowledge and understanding.
- ◆ To enhance knowledge capital, and hence competitiveness of Caribbean businesses, we need to first establish a scientific culture within our business enterprises.
- ◆ Scientists must accept responsibility for the ‘scientification’ of business by:
 - Popularising scientific issues/problems
 - Helping to demystify the scientific basis of business processes
 - Not waiting on others to create jobs for scientists in business but by creating science jobs and thereby demonstrate the value of scientific

knowledge and skills to existing enterprises or create new science-based enterprises themselves.

The Passage of Nuclear Waste through the Caribbean and its possible effects on Ecotourism

Dr John Agard, BSc, MSc, PhD

In the late 1970s, France agreed to treat 2.8 tonnes of Japan's nuclear waste based on the condition that it would be sent back to Japan to be stored. Dr Agard examined the path of the shipment of reprocessed plutonium and uranium oxide fuel from Europe back to Japan via the Caribbean Sea. He concluded that the transport of nuclear waste through the region poses a threat to the sustainable development of eco-tourism. This is a significant challenge since eco-tourism is the fastest growing tourism sub-sector in the Caribbean.

AIDS – Research and Implications

Dr Jeffrey Edwards

Dr Edwards presented data from current HIV research studies conducted in Trinidad and Tobago. Data presented include the fact that the first case of AIDS in Trinidad and Tobago was diagnosed in 1983 in an homosexual male. During 1983-1984 studies were conducted on 100 gay/bisexual males attending



Dr Jeffrey Edwards

the clinic for treatment of sexually transmitted diseases. The first cases of AIDS in women and children were diagnosed in 1985. Since then, data shows a transition to a rapid predominantly heterosexual HIV/AIDS epidemic. In 1996, heterosexual males and females accounted for 56.6% of AIDS cases.

All presentations were followed by discussions in which students fully participated.

- Concurrent sessions

Problem Solving in Science and Life

Rev. Steve West, BSc, MSc

Rev. West presented a paper which traced the need for problem-solving skills from the development of primitive man to learning in everyday life. He explored the use of problem solving techniques in the teaching of Science and outlined three models namely: Creative Problem Solving (CPS) by Noller and Mauthe

(1977), The Big Six Skills Model of Eisenberg and Berkowitz (1966) and A Thru E Approach to Problem Solving by Woodcock (1999).

Caribbean Disasters

Ms Joan Latchman, BSc (Hons), M.Phil.

This lecture dealt with the monitoring and detection of seismicity and volcanism in the Caribbean. Located on the eastern boundary of the Caribbean Plate, the islands of the Eastern Caribbean are subjected to subduction of the Atlantic Ocean lithosphere beneath the Caribbean Plate. This results in seismicity and volcanism. However, Ms Latchman illustrated that once the nature of the hazard is understood, steps can be taken to reduce the risk.

Natural Medicine – Alternative Medicine

Dr Harry Ramnarine MBBS.

In Trinidad, Dr Ramnarine is a pioneer in the field of energetic medicine. He is currently working in the field of natural and alternative methods of healing as well as conducting research in this area.

Dr Ramnarine provided participants with an overview of his work and research. He complemented his presentation with practical demonstrations which included a diagnostic procedure using the bioenergetic system of the body and the Vegatest Method by Helmut Schimmel.

Dr Norma Andrews

Dr Andrews introduced participants to the underlying scientific basis of alternative medical practice and discussed the importance of using systems that adhere to these scientific principles. She touched on the range of options available in alternative medicine and pointed to sources from which further information could be accessed.

- Field trips

These allowed participants to see research science and technology in action and observe nature centres. The aim here was to remind participants that industries and nature centres must be able to co-exist. The trips included industries such as Angostura Limited and KC Confectionery Ltd. and nature centres such as the Wild Fowl Trust and Asa Wright Nature Centre and a research institution.

Angostura Limited

Situated in Laventille, just east of Port of Spain, Angostura Limited is home to the world renowned Angostura aromatic bitters and Angostura-Barcant

Butterfly collection. The 170-year-old secret bitters blend was developed by Prussian doctor, Johann Gottlieb Benjamin Siegert. Today, in addition to aromatic bitters, Angostura produces a variety of alcoholic beverages including rum.

The CYSF tour included:

- ◆ Angostura-Barcant Butterfly collection
- ◆ Aromatic bitters production facility
- ◆ The bottling line and rum distillery

Asa Wright Nature Centre

The Asa Wright Nature Centre, 1,200 feet up in the rainforest of the Northern Range, is an old estate house that has become a conservation and study centre for naturalists and bird-watchers. This estate is home to over 170 species of birds as well as the most accessible colony of oilbirds in the world.

The Sugar Cane Feeds Centre

The Sugar Cane Feeds Centre is an institution of applied research, demonstration, development and training tropical livestock production. Located on 60 hectares of land at Longdenville, Central Trinidad, the Centre promotes integrated production systems which use farm and other local feed resources.

- Students' presentations

In preparation for CYSF, the following topics were sent to the participating countries:

- ◆ Pollution and its effects on the environment
- ◆ Food technology
- ◆ The Impact of tourism on science and technology popularisation
- ◆ Natural disaster preparedness
- ◆ Biotechnology
- ◆ Biological Diversity
- ◆ Information Technology.



Student presentations at CYSF

Working in teams of three to five persons, students were required to:

- ◆ Select a topic and identify a need/problem associated with the topic

- ◆ Design and develop an innovation that will satisfy the need or solve the problem identified
- ◆ Bring to the forum full reports including suitable products where possible.

Many groups addressed environmental issues and offered feasible solutions to the problems identified. Some of the solutions were:

- ◆ Educating the public about the damage that pollution does to the environment.
- ◆ Enforcing laws that govern pollution.
- ◆ Making adaptations to a reef buoy designed by John and Harold Hudson of the Key Largo National Marine Sanctuary, Florida. A group from Tobago worked on the adaptations in an attempt to prevent biotic and antibiotic damage to the Buccoo Reef.

St. Vincent addressed “Natural disaster preparedness” and suggested the development of a mobile sea wall that would protect the southern region of the island. The wall would be controlled by a calibrated vibration sensor or hydrophone miles away from land. When it senses abnormal wave motion, it transmits the information to a latch circuit that raises the seawall. Instead of having a water build-up, the waves would refract outwards, away from the island.

Dominica also looked at National disaster preparedness and suggested Public education, training in Shelter Management and communication skills.

The Barbados team examined “Sustainable biodiversity with special reference to saving the turtles in Barbados through the hands of children (6-10 age group)”.

This team felt that if the country planned to save the turtles generation after generation, it needed to target the children. The team collected all the data on the turtle and produced an activity booklet and a story booklet designed to disseminate information about turtles to children.

A Trinidad and Tobago group designed a Bi-O-Carrier which simultaneously maintains food at two different temperatures. The innovation comprises two compartments, one hot and one cold.

Summary of Evaluation

Findings of the evaluation on the experiences and views of participants included:

- ◆ Duration: Almost all participants felt that the Forum should have been conducted over a two-week period. One week was too compact for the programme of activities. Over 90% felt that it should be an annual event.

◆ Concurrent Sessions (lectures, student presentations): Participants felt that concurrent sessions should be omitted. They felt it was difficult to choose which they should attend and that they therefore missed interesting sessions and valuable information.

◆ About 89% of the participants said that some of the sessions helped them to select career goals.

◆ Over 95% said that they had the opportunity to receive answers to burning issues in science and technology.

◆ There was a very positive response by participants, when asked about the usefulness of the forum in providing information about new careers. Forty-eight per cent agreed that the information was useful, 38% strongly agreed. This gave an aggregate of 86%.

◆ Participants indicated that there was a good rapport established between the Lecturers and the Participants, so that burning questions and relevant issues of Science and Technology were aired and discussed. The response rate for this option of the question was 95%.



Delegates at the CYSF, 1999



A presentation from a member of one of the 12 Caribbean countries represented at the CYSF.

Some direct comments were:

Grenada

“An interesting, enlightening, exquisitely organised forum which I have benefited greatly from. I wish to see it continue on an annual basis.”

Guyana

“It is commendable that there were so many competent presenters. The information they passed on was invaluable. Interests in various subjects were stimulated in a way that they never have been before.”

Tobago

“This project was a well thought out one and by all means it should be a continuous even so that other students can benefit like I did”.

St. Kitts

“I strongly think that this forum should be held every year as it would give many more young people the opportunity to be a part of such a momentous occasion. I am proud to say that I attended the first CYSF and I am already looking forward to the one next year.”

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