FACULTY OF PURE AND APPLIED SCIENCES MONA

Year ending July 31, 2001

Professor Ronald E. Young, BSc, MSc *UWI*, **PhD** *St. And.* **– Dean**

Awards Ceremony, FPAS: *Dr Dale Webber (Sub-Dean), Prof. R.E. Young (Dean), Mr. Martin Henry, (Keynote Speaker) & Mrs. Pansy Young.*

Opening of Biennial, FPAS Research Conference. L-R: *Principal PVC Hall, PVC Morrison & Dr. Ralph Robinson, Conference Chairman & Head, Department of Life Sciences*

Opening of the Unit Operations Teaching Laboratory. L-R: *Past Dean Prof. Kenneth Magnus, Immediate Past Dean Dr. Neville McMorris .*

DEAN'S OVERVIEW

INTRODUCTION

At the end of the year 1999/2000, **Dr. M. Neville McMorris** retired after serving as Dean since 1993/94. Dr. McMorris' first major contribution to the Faculty as Dean was starting and establishing the Faculty's biennial Research Conferences in May 1994. This Conference has helped to give the Faculty and its research a higher profile. He also established a number of committees to look into issues pertinent to the Faculty such as our teaching and research programmes and assessment procedures. In 1996 when under new governance the Faculty's name was changed from Natural Sciences to Pure and Applied Sciences and several Departments were merged, Dr. McMorris was at the helm of that ship. In addition, three new research facilities, **The Mona Institute of Applied Sciences** (MIAS), the **Natural Products Institute** (NPI) and the **Tanaud Research Unit** in the Department of Chemistry, were established and a Memorandum of Understanding between the Faculty of Pure and Applied Sciences and the Scientific Research Council was signed, during his term of office. The Faculty will miss his clear, committed and objective guidance and wishes him well in his new endeavours. We look forward to a continuing association with this eminent member of the University community.

HIGHLIGHTS OF THE ACADEMIC YEAR

Major efforts were made during the course of the year to see to the development of the Mona Institute of Applied Science and the Natural Products Institute, both affiliates of the Faculty with a mandate to serve as a link between the Faculty's academic activities/capacities and business/ commercial enterprise. A colloquium between the Faculty and the business community and the official launch of the MIAS are planned for early in the next academic year. Through these and other developments the Faculty seeks to embrace and develop the changing nature of the relationship between the academy and the community which supports its activities.

Undergraduate

The new majors in *Pest Management & Plant Protection* and *Environmental Biology* introduced by the Department of Life Sciences are doing well. There was less interest than expected in the new *Microbiology* option being offered collaboratively between the Department of Life Sciences and the Biochemistry Section, Department of Basic Medical Sciences. Two new courses in *Database Systems* and *Cryptography* were introduced in the Department of Mathematics & Computer Science. The Department of Physics revamped its Level 2 & 3 courses, converting them largely into 4 credit modules, in order to increase flexibility of choice for their students.

A new *Science with Media & Communications* course was drafted by the Department of Life Sciences and CARIMAC, but this has yet to be fully approved and inaugurated.

To broaden the range of choices open to its students, the Faculty agreed for the first time, to offer specified minors and these were defined for all departments. The Faculty although not being fundamentally opposed to the idea, decided not to introduce at this time Joint Majors across Faculties. It was felt that this niche was filled for the moment by the cross-faculty Options, which it was deemed, offered greater security for the students involved.

At the annual Awards Ceremony in March, Martin Henry, journalist gave the keynote address and, based on performance, some 28 students received scholarships and bursaries, 18 received various departmental prizes and awards, and 13 were given letters of commendation from the Dean.

Total FPAS registration for 2000/2001 was 1190 (947 full-time + 181 part-time + 62 exams only/challenge). The registration by courses in the various teaching departments is summarised in the Table I below, which presents the mean number enrolled per course by department.

TABLE I

Registration by Course in Departments of the Faculty (2000/2002)

Department	No. of Courses	Enrolment	Mean No./Course
Chemistry	26	1299	50.0
Life Sciences	41	1650	40.2
Physics	12	538	44.8
Math & Comp Science	44	2390	54.3
Geography & Geology	37	945	25.5
TOTAL	**160**	**6822**	**42.6**

Graduate and Other Training

The first batch of 20 students graduated from the EU-funded *MSc in the Natural Resource Management* in November. The new *MSc in Biostatistics* offered jointly by the TMRI, Department of Mathematics & Computer Science, and the Medical University of South Carolina, with support from the NIH (USA), started with two students, and one staff member receiving training. The process of seeking funds for the University-wide MSc in Tropical Environmental Management having bogged down, the Department of Life Sciences is preparing to offer its contribution to that programme, independently as a component of an MSc in Environmental Biology.

The Better Process Control School run by the Department of Chemistry became the only non-USA institution approved by the US-FDA to grant independent certification to the participants in its training programme for personnel involved in the canning and bottling industries. Thirty-five graduates completed the course in January this year.

A training course in *Asbestos Sampling & Analysis* was run in the Department of Chemistry in February and the collaboration continues, between the Chemistry Department, the Joint Confederation of Trades Unions (JCTU) and several business organizations, to enhance occupational health of workers and general environmental health and related regulations.

The numbers of graduate students registered in the MSc and MPhil programmes have risen steadily, while those in the PhD programme have remained quite stable. This is shown in Table II below.

TABLE II

Graduate Students Registered in the Faculty

	1998/99	**1999/00**	**2000/01**
MSc	50	86	96
MPhil	146	157	169
PhD	35	40	37

EQUIPMENT/PLANT

The new **Unit Operations Teaching Laboratory** donated by Chemistry Department alumni and other contributors, was finally opened, after several setbacks. This will provide much needed space for the operation of the applied chemistry and food chemistry groups.

The Department of Chemistry acquired two costly and related pieces of equipment which will considerably enhance its attractiveness to chemists working at the cutting edge of the discipline. These are a 500 MHz NMR spectrometer and a Liquid Nitrogen Generator. Estimates of service costs for these and other major items to be acquired soon, are as follows (US$):

500 MHz NMR	–	$15,000 to $20,000
GC/MS	–	$10,000
LC/MS	–	$10,000
Liquid Nitrogen Plant	–	$5,000

Service cost for existing instruments is about $30,000.00.

The Port Royal Marine Laboratory replaced its ailing wooden pier with a new cement dock, and the Department of Life Sciences acquired a new Mitsubishi L200 4x4 twin-cab pick-up via the Board for Graduate Studies & Research.

As a result of a visit to India in November/December 2000, by the Dean and Dr. Ajai Mansingh, the Executive Director of the NPI, the Indian government has promised to assist the faculty in setting up a toxicology laboratory to help to carry forward the mission of the NPI.

A major concern continues to be the development of a clear and sustainable plan for maintenance, depreciation and replacement of equipment/plant.

WORKSHOPS & CONFERENCES

The Faculty of Pure & Applied Sciences **Fifth Biennial Research Conference** in January attracted 103 papers, with participants coming from all Campuses. The Public Forum brought together professionals from the public and private sectors, scientists and media, to discuss *"UWI's Science Enterprise: Accomplishments and Challenges."* The Department of Chemistry hosted a workshop on Metrology in collaboration with the Bureau of Standards. The Department of Mathematics & Computer Science co-hosted the National Conference for Mathematics Teachers; and the Physics Department hosted the Caribbean Climate Data Workshop, run in collaboration with WMO, NOAA-OGF and NASA, and involving some 18 Caribbean Met services.

GRANTS

The departments were able to bring in some thirty internal plus external grants, totalling over thirty million Jamaican dollars in all (Table III).

TABLE III

Department	Internal (J$ eqlt)	No Grants	No. Grants	External
Geography & Geology	$ 460,000	1	$ 2,622,000	2
Physics	–	–	$ 1,196,000	1
Chemistry	$1,697,032	3	$ 8,436,500	5
Life Sciences	$ 930,120	4	$ 1,760,990*	4*
Biotechnology	$ 46,000	1	$ 2,231,000	1
Centre Marine Science (CMS)	–	–	$10,734,628	8
TOTAL	**$3,133,152**	**9**	**$26,981,118**	**21**

***Consultancies/Contracts**

PUBLICATIONS

The Departments have been more focussed upon conference presentations (abstracts) than upon full publications but in neither case has the output, generally, been exemplary (Table IV).

TABLE IV

Department	No. Staff	Refereed Publications	Non-Refereed Publications	Conference Presentations
Chemistry	22	24	–	10
Geog & Geology	13	3	4	22
Life Science	20	4	6	21
Physics	14	2	–	10
Math & Comp Sci	16	8	–	3
Biotechnology	4	1	–	4
CMS	2	–	–	11
TOTAL	**91**	**42**	**10**	**81**

This analysis points to the outstanding performance of the Chemistry Department and suggests that our Centres have not been notably productive in terms of publications. Differences in academic staff complement should be taken into account, although Centre personnel have fewer undergraduate teaching responsibilities. It should be noted that the Centres have been relatively successful, on a per capita basis, at bringing in grants. The overall picture certainly could be improved.

CONCLUSIONS

The Faculty has had a quite successful year in terms of obtaining grants for research and related studies. Our efforts to reach out to the national and regional communities which support the University are beginning to gain momentum. With increasing investment in upgrading research facilities however, we need to see increased output of refereed publications in good international Journals, which will help to enhance the reputation of the University in international professional circles. We also need to develop mechanisms for maintaining current, and replacing obsolescent equipment so as to sustain our competitiveness. If these aims are successfully achieved, they will help in more easily recruiting better staff and in mounting more attractive graduate and undergraduate courses, and so allow us to compete more effectively in attracting students locally and internationally.

DEPARTMENT OF CHEMISTRY

Professor Tara P. Dasgupta, BSc *Calc*, **MSc** *Bihar*, **DPhil** *Calc.* **FRSC**
– Head of Department

INTRODUCTION

The Department continued to play a pivotal role in the development of teaching and research programmes in the Faculty. Although there is a trend in the decreasing undergraduate student enrolment in the Faculty there is no apparent trend in the enrolment in Chemistry (see the Table below). The enrolment of students for graduate studies in the Department remained unchanged. The research facility in the Department was enhanced by the procurement of two new instruments -500 MHz Nuclear Magnetic Resonance (NMR) spectrometer and Liquid Nitrogen Generator.

The highlight of the year's activities were two special events. The new building for the Unit Operation teaching laboratory which was under construction was officially opened on April 6, 2001. However, the teaching programme in this new laboratory started from February, 2001 as scheduled.

The second event was the hosting of "**Better Process Control School" (BPCS)** from January 8-12, 2001. The course had thirty five participants including five from the Eastern Caribbean. Certificates of Satisfactory Completion were offered to candidates who had successfully completed the certifying subjects and who were subsequently approved by the United States Food and Drug Administration (US FDA). Currently, the UWI is the only non-North American institution which is approved by the US FDA to certify participants of a BPCS.

The Department conducted a **Training Course in Asbestos Sampling and Analysis** from February 19-22, 2001. The seminar was sponsored jointly by the Ministry of Health, Pan American Health Organisation (PHO) and the National Environment and Planning Agency (NEPA). There were twenty-five participants in the course from both the private and public sectors.

STUDENT ENROLMENT

LEVEL	1998/99	1999/2000	2000/2001
Preliminary	140	188	135
Introductory	237	247	203
Advanced	1140	864	896

STAFF MATTERS

Dr. Laszlo Szentpaly resigned from his post of Senior Lecturer in Physical Chemistry to take up a post in Germany.

Professor Ishenkumba Kahwa, **Dr. Helen Jacobs** and **Dr. H. Anthony Ellis** were granted sabbatical leave.

Mr. Howard Reid was appointed as Teaching Assistant for one year to replace Professor Kahwa

Dr. Nazim Mohamed was appointed as a lecturer in Organic Chemistry for one year to replace Dr. Helen Jacobs.

Dr. James Smith was appointed as an Assistant Lecturer for one year to replace Dr. Ellis.

Dr. Romola Rodriques was appointed as a Teaching Assistant for one semester to assist in our teaching programme.

ATTENDANCE AT CONFERENCES

Professor Tara Dasgupta attended the CARISCIENCE annual meeting held in Georgetown, Gyana and delivered a lecture entitled "Recent Developments in Science and Technology". He also attended the Caribbean Academy of Science meeting also held in Guyana and presented a paper on "Chemical Degradation of Pesticides in aquous solution".

Dr. H. Jacobs was a Plenary Speaker at the Annual meeting of the American Society of Pharmacognosy, Oaxaca, Mexico, July 14-18, 2001. She spoke on Latin American Biodiversity.

Dr. J. Jackson attended the Symposium of Traditional Grain and Starchy Food Products of Asia, Africa, Latin America and the Caribbean, IFT Annual Meeting. And presented a paper on "Traditional Starchy Products from the Caribbean"

Professor I. Kahwa, presented an invited lecture on "Asbestos pollution in Jamaica – lessons and perspectives for the Caribbean." at St. Lucia, Castries. He delivered a Plenary lectures on "Science's Challenges and Strategies for Reducing Poverty." at the Caribbean Academy of Sciences, Georgetown, Guyana and at the University of Suriname, Faculty of Science and Technology. He also presented seminars on "New concepts in biomedical diagnostics and catalysis" at the same meetings. He was financed by CARISCIENCE for his trip. He also attended the Annual Conference of the Royal Society of Chemistry with sponsorship from the Royal Society of Chemistry and presented a paper on "Electronic and Chemical cooperativity among coupled Lanthanide (III) cations". Prof.

Kahwa gave a plenary lecture at the 8th International Chemistry Conference in Dakar, Senegal, Africa. His talk was entitled "From discrete dimetallic molecules to polymetallic nano-size aggregates: metal-metal interactions and their potential applications".

STUDENT MATTERS

Postgraduate Awards

The Department had a new postgraduate scholarship added to the list of awards – *The Henry Lowe Scholarship*. Dr. Lowe, President and Chief Executive Officer of Blue Cross Jamaica Limited donated and presented $50,000.00 to Ms. Camille Bowen while Ms. Jane Lui received the Cedric Hassall Award for $40,000.00.

Undergraduate Awards

A total of seven undergraduate students from the Department received awards ranging from $5,000 to $60,000.

RESEARCH GRANTS

Dr. Jose Jackson received grants of:

i) US$100,000.00 from the Organisation of American States (OAS)

ii) US$12,000.00 from International Foundation for Science (IFS)

iii) US$20,000.00 from Food and Agriculture Organization (FAO)

iv) US$15,892 from the Graduate Studies and Research, UWI

Professor Ishenkumba Kahwa received a grant of:

i) J$2.28 million from Environmental Foundation of Jamaica in support of a joint project by the Department of Chemistry and the Jamaica Confederation of Trade Unions (JCTU)

ii) £1300.00 from the Royal Society of Chemistry, London

iii) US$15,000.00 from the Graduate Studies and Research, UWI.

Dr. Willard Pinnock received US$6,000.00 from the Graduate Studies and Research, UWI.

RESEARCH IN PROGRESS

Bakir, M.

- Development of electro-and optical sensors based on poly-pyridyl like compounds.

Dasgupta, T. P.

- Mechanisms of electron transfer reactions.
- Syntheses of nitric oxide releasing compounds and kinetic studies of nitric oxide release
- Dynamics of pesticide degradation and analyses of ultratrace pesticide residue.

Dixon, D.

- Kinetic and mechanistic study of the reaction of the free chromium(VI)ion with a series of thiol containing compounds in aqueous acidic conditions.
- Study of cubane systems containing lithium as the only metallic element.

Greenaway, A.

- Nutrient pollution in Jamaican coastal waters.
- Nitrogen and Phosphorus concentrations in ground and surface waters and their fluxes to the coastal zone.
- Nutrient release from contaminated estuarine sediment.

Jacobs, H.

- The phytochemistry of selected Jamaican endemic plants.

Jackson, J.

- Quality and Safety enhancement of the ackee fruit
- Characterization and antioxidant activity of the phenolic components in sorrel and nutmeg mace.

Jackson, Y.

- Synthesis of heterocyclic compounds with biological activity.

Kahwa, I.

- Preparation, structure, laser induced luminescence spectroscopy and decay dynamics and potential applications of multi-lanthanide (III) compounds in catalysis, biomedical diagnostics and therapeutics.
- The asbestos pollution and waste management strategies in Jamaica.

Lancashire, R.J.

- Chemical applications of the Internet.
- The JCAMP-DX spectroscopic data format and distribution of scientific data via the WWW.

Maragh, P.

- Oxidation of biological reductant (Vitamin C) by tri-nuclear transition metal complexes.

Minott, D.

- Characterisation of the flavour components of Jamaican Blue Mountain Coffee.
- Investigation of ackee *(Blighia Sapida)*, its lipid profile, hypoglycin content and metabolites of its individual components.

Pinnock, W.R.

- A city wide survey of SO_2, NO_2 and O_3 at fifteen sites across the Kingston/St. Andrew conurbation following the development and testing of our own SO_2 and O_3 monitors.
- The use of red mud in building materials
- The sulphate resistance of concrete which contains red mud as an additive is to be tested in the next round of experiments.

Sadler-McKnight, N.

- Election transfer reactions of transition metal complexes.

Reese, P.

- Medicinal Plants. Plants, mainly from the family Labiatae, Scrophulariaceae and Capparaceae families, are being examined to isolate and characterise the major natural products.
- Microbial transformations. Natural products of agricultural and pharmaceutical interest are structurally modified by selected strains of fungi in an effort to produce a range of new analogues with enhanced bioactivity.

Mulder, W.

- Modelling of oxidative adsorption of alkanethiols on metals.
- Determination of dipole moments and polarisabilities of organic molecules in solution using variation of reaction field via ionic strength.

PAPERS PRESENTED

- "Nutrients in Jamaican Coastal Waters." **Anthony M. Greenaway**. (Poster) 5th Conference, Faculty of Pure and Applied Sciences, UWI, Mona, January 2001.
- "The Proposed Jamaican Accreditation Standard for Chemical Testing Laboratories." **Anthony M. Greenaway** (Poster). 5th Conference, Faculty of Pure and Applied Sciences, UWI, Mona, January 2001.
- "Explorations into the synthesis of beta-azarotenonoids;" Karla-Sue Marriott and **Y. Jackson**. 33rd Central/Great Lakes Joint Regional Meeting of the American Chemical Society, Grand Rapids, Michigan, June 2001.
- "Synthesis of the First Thiophene Analogue of Kuanoniamine A;" Seon Hepburn **, Y. Jackson** William Reynolds. 33rd Central/Great Lakes Joint Regional Meeting of the American Chemical Society, Grand Rapids, Michigan, June 2001.
- "Interactive Web Page Development with CHIME and JAVA-Part II". **R. J**. **Lancashire,** "Chemistry and the Internet, 2000" at Georgetown University in Washington, DC, September 2001.
- "Lessons from the development of a Research and Teaching Departmental Web Site." **R. J. Lancashire** Presented at the 5th Biennial Conference of the Faculty of Pure and Applied Sciences, January 2001.
- "Steroid transformation by *Mucor plumbeus* ATCC 4740." A.R. Chen and **P.B. Reese,** American Chemical Society Annual Meeting, San Diego, California, U.S.A., April 2001
- "Bioconversion of *Stemodia maritima* diterpenes and derivatives by *Cunninghamella echinulata* var. *elegans* ATCC 8688a." A.S Lamm and **P.B. Reese**, American Chemical Society Annual Meeting, San Diego, California, U.S.A., Aprl 2001
- "Bioconversion of squamulosone and synthetic analogs by *Curvularia lunata* ATCC 12017." D.O. Collins and **P.B. Reese**, American Chemical Society Annual Meeting, San Diego, California, U.S.A., April 2001
- "Computer Simulation of Collisions as Lab Exercise in Introductory Chemical Thermodynamics" **W. R. Pinnock**: 16th IUPAC Conference on Chemical Thermodynamics, Halifax, Canada, August 2000.

PUBLICATIONS

Refereed

* Mechanistic study of the Reactions of the Chromium (VI) Ion in aqueous sulfite solution. Dwight C. Ramdon, **Donovan A. Dixon** and **Tara P. Dasgupta**. Inorg. Reac. Mech. 2, pp313-325, 2000

* Isotopic Effects on Inorganic Carbon in a Tropical River by Caustic Discharges from Bauxite Processing. J.E. Andrews, **A.M. Greenaway**, P.F. Dennis and D.A. Barnes-Leslie. Applied Geochemistry, 2001, 16, 197-206.

* Prenylated benzophenone derivatives from Clusia havetioides var. stenocarpa. Omar E. Christian, Geneive E. Henry, **Helen Jacobs**, Stewart McLean and William F. Reynolds. J. Nat. Prod. 64, 23-25. 2001

* New diterpenes from Jatropha divaricata Richard W. Denton, Wayne W. Harding, Chadwick I. Anderson, **Helen Jacobs**, Stewart McLean and William F. Reynolds. J. Nat. Prod. 64, 829-831, 2001

* A short synthesis of 5-Methoxy -2, 2- dimethyl – 2H-1-benzopyran-6-propanoic acid methyl ester. Geneive E. Henry and **Helen Jacobs**, Tetrahedron 57, 5335-5338, 2001

* Synthesis of a 2, 3 – Dimethoxyrotenonoid with Karla-Sue Marriott and Mario Anderson, **Yvette Jackson**. Heterocycles, 55, 91-98, 2001

* Cooperative processes governing formation of small pentanuclear lanthanide (III) nanoclusters and energy transport within and between them. M.K. Thompson, M. Vuchkov and **I.A. Kahwa** Inorganic Chemistry 40, 4332, 2001

* Neuropharmacological actions of some binuclear lanthanide (III) complexes. L.A.D. Williams, R.C. Howell, R. Young and **I.A. Kahwa.** Comparative Biochemistry and Physiology 128, 121, 2001

* A linear supramolecular array of $\{[Mn(H_2O)_2(15\text{-crown-}5)]Br_2\}n$. H.O.N. Reid, **I.A. Kahwa**, J.T. Mague and G.L. McPherson Acta Crystallographica E57, m3. 2001

* Ethylenediammonium phthalate. S.H. Edwards, **I.A. Kahwa** and J.T. Mague Acta Crystallographica E57, o20, 2001

* 2,2'-Iminobis(ethylammonium) phthalate. S.H. Edwards, **I.A. Kahwa** and J.T. Mague. Acta Crystallographica E57, o22, 2001

* Rare earth crown ether complexes: (15-crown-5) tris(nitrato) praseodymium(III). N.N. McIntosh**, I.A. Kahwa** and J.T. Mague Acta Crystallographica E57, m21, 2001

* N,N'-Ethylenebis(p-toluenesulfonamide). A.S. Gajadhar-Plummer, **I.A. Kahwa** and J.T. Mague Acta Crystallographica E57, o68, 2001

* The use of the Internet for teaching chemistry. **R. J. Lansashire** Anal. Chim. Acta, 420/2, 241-246, 2000.

* Elections Transfer Kinetics of Tris (1, 10 – phenanthroline) Ruthenium (II) Electro oxidation in Aprotic Solvents. **N. McKnight**, K. Winkler, W. Fawcett Journal of Physical Chemistry, B, 104, 3575-3580 (2000).

* Cobalt (III) promoted hydrolysis of 4-nitrophenyl phosphate; the role of dinuclear species. G. Rawji, **N. Sadler**, M. Yamada, R.M. Milburn Inorg. Chim. Acta 167-174, 2000

* New Skeletal Sesquiterpenoids, Caprariolides A – D, from *Capraria biflora* and their insecticidal activity. D.O. Collins, W.A. Gallimore, W.F. Reynolds, L.A.D. Williams and **P.B. Reese,** J. Nat. Prod., 63, 1515-1518, 2000

* Biotransformation of Diterpenes and Diterpene Derivatives by Beauveria bassiana ATCC 7159. G.O. Buchanan and **P.B. Reese**, Phytochemistry, 56, 141-151, 2001.

* Remote Functionalization Reactions in Steroids. **P.B. Reese**, Steroids, 66, 481-497, 2001.

* Biotransformation of Cedrol by *Curvularia lunata* ATCC 12017. D.O. Collins, G.O. Buchanan, W.F. Reynolds and **P.B. Reese**, Phytochemistr*y,* 2001, 56, 417-421, 2001.

* Biotransformation of Squamulosone by *Curvularia lunata* ATCC 12017. D.O. Collins, G.O. Buchanan, W.F. Reynolds and **P.B. Reese**. Phytochemistry, 2001, 57, 377-383.

* A potential dependent polarizability? K.J. Donald, **W.H. Mulder** and L.v. Szentpaly, Journal of Chemical Physics 113, 3477, 2000

* A kinetic model for the reductive desorption of self-assembled thiol monolayers, **W.H. Mulder**, J.J. Calvente and R. Andrew. Langmuir 17 (2001), 3273.

* Radon Levels and Related Doses in a Prototype Jamaican House constructed with Bauxite Waste Blocks**. W.Pinnock** Radiation Protection Dosimetry 81, 291-299, 1999.

PUBLIC SERVICE

Professor Tara Dasgupta

- Chairman, Faculty Committee for Graduate Studies and Research
- Editor, Jamaican Journal of Science and Technology
- Director, Mona Institute of Applied Sciences
- Executive Member, Natural Product Institute
- Executive Member, CARISCIENCE
- Editorial Board, Inorganic Reaction Mechanisms.

Dr. A.M. Greenaway

- Member, National Zone Commission
- Member, Jamaica Bureau of Standards' "Quality Management Systems Committee" and Chairman, Subcommittee for Accreditation of Chemical Laboratories.

Dr. H. Jacobs

- Board Member, National Arboretum Foundation.

Dr. J. Jackson

- UWI Representative, Agro-Processors Resource Network (APRN), Jamaica
- Member, Institute of Food Technologists (IFT), USA
- Executive Member of the International Division
- Jury Member for the International Paper Competition
- UWI Representative on Policy Planning Committee of Quality Infrastructure Development Project, Jamaica Bureau of Standards

Dr. Y. Jackson

- Foreign Research Mentor for the Minority International Research Training Programme, Barry University, Florida
- Regional Editor – Molecules
- Member, Board of Governors, Hampton High School, St. Elizabeth
- Director of Music- St. Joseph's United Church, Kingston

Professor I. Kahwa

- Member, Asbestos Task Force, National Environment and Planning Agency (Formerly NRCA)
- Member, Board of Directors, ICENS

- Member, Intellectual Property rights Committee, UWI.
- Member, CHEMLAB Project Committee, Journal of Chemical Education, American Chemical Society
- Regional Editor-Molecules

Dr. R. Lancashire

- University Representative, Board of the Jamaica Computer Society Education Foundation
- Executive Member, Society of Scientists and Technologists

Dr. P. Maragh

- Member, National Industrial Safety Committee – Bureau of Standards
- Member, Museums Advisory Board – Institute of Jamaica

Dr. D. Minott

- Member, National Ackee Task Force
- Member, Jamaica Bureau of Standards – Processed Foods (General) Committee
- Member, Scientific Research Council Board's Sub-Committee for the Food Technology Institute
- Corresponding Sponsor, Ministry of Education – Kencot Basic School Agro-Processing Resource Network
- Vice President, WIGUT (Jamaica)
- Director, Better Process Control School (certification for the food industry)

Dr. N. Sadler-McKnight

- Member, Natural Resources Conservation Authority.
- Member, Technical and Finance Committee of the Scientific Research Council
- Council Member, Jamaica Society for Scientists and Technologists (JSST).
- Executive Secretary, Alumni and Friends of the Department of Chemistry, UWI, Mona (CHEMSAF).

Dr. P. Reese

- External Examiner, Bachelor of Pharmacy programme at the University of Technology, Hope
- Member, Equine Drug Testing Committee

Dr. W. Mulder

- Member, CHEMSAF (Alumni and Friends of the Department of Chemistry) and Newsletter Committee

Dr. W. Pinnock

- Member and Consultant, Steering Committee to prepare Jamaica's First National Communication to the U.N. Framework Convention on Climate Change.
- Member, National Radiation Safety Council, Ministry of Health
- Member, Steering Committee for Implementing Food Irradiation Technology in Jamaica.

VISITORS TO THE DEPARTMENT

Hon. Oliver Clarke, O.J., Chairman and Managing Director of The Gleaner Company Limited.

Dr. Darryl J. Bornhop of the Department of Chemistry and Biochemistry, Texas Tech University, USA.

Professor Delroy Baugh of the Department of Chemistry and Biochemistry, University of California.

Dr. Laval Chan, Senior Scientist, Biochem Pharma, Canada.

Dr. Raymond Francis of SUNY College of Environmental Science and Forestry, Syracuse, New York, USA

Mr. Stewart Forbes of the Natural Resources Conservation Authority.

Professor Cyril Parkanyi of Florida Atlantic University.

Dr. Richard Fairman, Lecturer, University of the West Indies, St. Augustine, Trinidad.

Dr. James D. Navratil, Professor, Environmental Engineering and Science, Clemson University.

Dr. Alvin Holder, Lecturer, University of the West Indies, Cave Hill , Barbados.

DEPARTMENT OF GEOGRAPHY AND GEOLOGY

Professor Elizabeth Thomas-Hope, **MA** *Aberdeen,* **MS** *Penn State,* **DPhil** *Oxf* **– Head of Department**

WORK OF THE DEPARTMENT

Dr Wilma Bailey was promoted to Professor of Geography in April. **Dr Vernon Mulchansingh** retired as Senior Lecturer in Geography in July. **Dr Hugh Semple**, Lecturer in Geography, resigned in July.

Dr David Barker was awarded a post-doctoral research fellowship to continue work on small, hillside yam farming and environmental resource management; **Dr Clinton Beckford** was appointed research fellow to work on the project.

Professor Wilma Bailey was the representative of the Faculty of Pure and Applied Sciences on the University committee which led the consultations on crime, peace and justice in Jamaica.

Revisions were made to the Level III courses in Geography. Titles of courses were changed to more accurately reflect their contents, and the titles of the three groupings of these courses were also changed.

During the summer, GL30D Analysis and Management of Geohazards and Risks was put on by **Mr Rafi Ahmad**. Ten students, including one from Appalachia State University (USA) and one from the St Augustine campus, read the course.

The first group of twenty students in the taught MSc degree in Integrated Urban and Rural Environmental Management directed by **Professor Elizabeth Thomas-Hope** graduated in November 2000. To mark the occasion, the graduates organized a tree-planting ceremony on the grounds of the Department, and the Chancellor, Sir Shridath Ramphal, planted a lignum vitae tree. The second cohort of students completed its course work during the year, while the third intake of fifteen students began its course of study in September 2000.

The Department continued to administer the Earthquake Unit, the Unit for Disaster Studies, the Environmental Management Unit, and the Jamaica Sustainable Development Network. The Marine Geology Unit was set up in December 2000; funded by the Environmental Foundation of Jamaica, it will collect information on the physical oceanographic and geological resources of Jamaica's Exclusive Economic Zone.

RESEARCH IN PROGRESS

Mr Rafi Ahmad

- Neotectonics, landslide processes, structural and lithological controls on the evolution of landforms; natural hazard mapping and assessment; preparation of hazard maps in Jamaica.

Professor Wilma Bailey

- Health of the elderly in Jamaica; intervention strategies in inner-city communities (funded by the Ford Foundation).

Dr David Barker

- Alternatives to the traditional yam stick method of staking yams (with post-doctoral research fellow Dr Clinton Beckford).

Professor Trevor Jackson

- Mineralogy and provenance of the black sands, south coast, Jamaica; the volcanic petrology of pre-Soufrière rocks in St Vincent; the Miocene volcanics of Carriacou, the Grenadines; Jamaican agates.

Dr David Miller

- Review of the karst geomorphology of the White Limestone Group, Jamaica; ridge karst geology and geomorphology in southern St Elizabeth; geomorphology of tower karst on the plateau surface of southern Manchester; cone karst morphometry and geology on the Manchester-St Elizabeth border; the geomorphological legacy of Quaternary environmental change, south central Jamaica; the palaeoenvironmental significance of solifluction deposits and cryoplanation terraces in southwest England.

Dr Simon Mitchell

- Sedimentology of Recent carbonate beaches, Jamaica; lithostratigraphy and sedimentology of the Yellow Limestone Group, Jamaica; lithostratigraphy and palaeogeography of the White Limestone Group, Jamaica; Red Chalk Research Group; geology and stratigraphy of the Central Inlier, Jamaica; sustainable development of sand mining and sediment budgets in Jamaican rivers; palaeokarst in Jamaica.

Professor Edward Robinson

- Taxonomy and biostratigraphy of Mesozoic to Recent larger foraminifera (Protists) in the Western Hemisphere, particularly the imperforate genera of the shallow shelf and carbonate platform areas,

and the lepidocyclinid groups; the use of large foraminifera in high-resolution sequence and biostratigraphy in the search for oil; historical documentation of coastal change in Jamaica; investigation of beach changes at Negril, Jamaica (with S. Mitchell and R. Maharaj).

Dr Hugh Semple

– Downtown revitalization in Kingston, Jamaica; agro-biodiversity among small farmers in the Rio Grande valley, Jamaica; adoption and implementation of GIS in planning and environmental agencies in Jamaica; identifying and planning for hazard-prone areas in the KMA and Portmore using GIS; geographic targetting for poverty reduction in Jamaica using GIS.

Dr Balfour Spence

– Agrobiodiversity and small farming in the Rio Grande valley, Portland.

Dr Thomas Stemann

– Overview of coral biodiversity in Jamaica from the Late Eocene through the Miocene; analysis of Palaeocene corals of Colombia; biostratigraphy of Jamaican Cretaceous corals (with S. Mitchell).

Professor Elizabeth Thomas-Hope

– Agro-biodiversity and land management in the Caribbean; poverty and urban environmental management; environment and health; environmental perception and its implications for environmental management; international migration and migration policy in regard to the Caribbean.

PAPERS PRESENTED

R. Ahmad

- "Fractal characteristics of landslides in Jamaica." Fifth Conference, Faculty of Pure and Applied Sciences, UWI, Mona, January 8-11, 2001.
- "Ground deformation - landslides and liquefaction - caused by 2001 earthquakes in El Salvador, western India, and Seattle, and earthquake preparedness in Jamaica." Seminar on The Anniversary of the March 1, 1957 Montego Bay Earthquake, organized by the Office of Disaster Preparedness and Emergency Management, March 1, 2001.

- "The use and application of landslide hazard maps." National Consultation on the Use and Application of Hazard Maps, organized by the Office of Disaster Preparedness and Emergency Management, June 28, 2001.

W. Bailey

- "Mistimed and unwanted pregnancies among Jamaican males 15-45 years." Annual Meeting of the Population Association of America, March 2001.

R. Maharaj, S.F. Mitchell & E. Robinson.

- "Beach erosion in Negril, Jamaica." IHDP Conference, Bonn, Germany, September 9-19, 2000.

R. Maharaj & S.F. Mitchell

- "Sequence stratigraphy of a transgressive tropical carbonate depositional system." Geological Society of America Annual Conference, Reno, Nevada, November 2000.
- "Sequence stratigraphy of the Stettin Formation, Jamaica." Fifth Conference, Faculty of Pure and Applied Sciences, UWI, Mona, January 8-11, 2001.

S.F. Mitchell, S. Khan, **R. Maharaj** & **E. Robinson**

- "Changes in carbonate beach sediment composition at a tourist beach, Negril, Jamaica." Carbonate Beaches 2000, Key Largo, Florida, December 2000.

S.F. Mitchell

- "Unconformities in central Jamaica: unlocking Jamaica's geological past." Fifth Conference, Faculty of Pure and Applied Sciences, UWI, Mona, January 8-11, 2001.

E. Robinson, **R. Maharaj**, M.D. Hendry & **S.F. Mitchell**

- "Carbonate beach system at Negril, Jamaica: geological setting and evolution." Carbonate Beaches 2000, Key Largo, Florida, December 2000.

B. Spence

- "Sustainable development and environmental health." Conference of the Jamaica Northeast Area Regional Health Authority, February 2001.

T. Stemann

- "Coral communities in transition: a case study from the Jamaican fossil record." Fifth Conference, Faculty of Pure and Applied Sciences, UWI, Mona, January 8-11, 2001.
- "Changing patterns of taxon dominance in patch reef assemblages from the Oligocene and Miocene of Jamaica." Geological Society of America Annual National Meeting: Tropical Marine Environments Through Time Symposium, November 13-16, 2000.

E. Thomas-Hope

- "Trends and patterns of migration in and out of the Caribbean." Regional Seminar on Caribbean and Latin American Migration, Economic Commission for Latin America and the Caribbean (ECLAC) and International Organization for Migration (IOM), San Jose, Costa Rica, September 3-5, 2000.
- "Globalization and contemporary Caribbean migration." Regional Seminar on Trends in Caribbean Migration, ECLAC, Trinidad, November 9-10, 2000.
- "Contemporary issues in Caribbean migration." Regional Seminar on Migration, The Faculty of Latin American Social Sciences, Santo Domingo, and the IOM, Dominican Republic, November 27-29, 2000.
- "Perspectives on the Island Sustainability, Livelihood and Equity (ISLE) programme." Workshop for the Presentation of Research Findings - The Nariva Swamp: A Gendered Case Study, Trinidad, Centre for Gender and Development Studies, UWI, St Augustine, December 8-9, 2000.
- "Changing patterns of urbanization and health in the Caribbean." The German National Committee on Global Change Research International Workshop on Health and Environment, University of Bonn, February 14-16, 2001.
- "The role of the environment in explaining economic disparities in the Caribbean." Workshop on Explaining Economic Disparities in the Caribbean in the Twentieth Century, IDB, Trinidad, May 14-16, 2001.
- "Challenges of migration that are common to countries of the Caribbean," and "Irregular migration with respect to Caribbean nationals." International Training Seminar on International Migration Policy, Kingston, May 30-June 1, 2001.

- Opening Address. The National Coastal Zone Conference 2001, The National Environment and Planning Agency (NEPA) and the Coastal Waters Improvement Project (CWIP), Kingston, June 7, 2001.
- "The role of environment in Caribbean economic development." The Tenth Congress of the International Federation of Latin American and Caribbean Studies (FIEALC), Institute of Latin American Studies and the Russian Academy of Sciences, Moscow, June 26-29, 2001.

PUBLICATIONS

Refereed

* **D. Barker** "A brief history of geographical times." *Area*, 32(4) (2000): 437-439.
* A. Gupta & **R. Ahmad**. "Urban steeplands in the tropics: an environment of accelerated erosion." *GeoJournal*, 49 (2000): 143-150.
* **S.F. Mitchell** & D. Blissett. "Lithostratigraphy of the Late Cretaceous to Paleocene succession in the western part of the Central Inlier of Jamaica." *Caribbean Journal of Earth Science*, 35 (2001): 19-31.
* **H. Semple** & J. Brierley. "A logit analysis of problems affecting domestic food production in Guyana." *Social and Economic Studies*, 49, 1 (2000): 211-224.
* M.G. Sumbler & **S.F. Mitchell**. "Discussion of The Welton Formation (Chalk Group, Upper Cretaceous) at Speeton, northeast England: implications for the Late Cretaceous evolution of the Market Weighton Structure." *Proceedings of the Yorkshire Geological Society*, 53 (2000): 17-24, 157-159.
* **E. Thomas-Hope**. "Trends and patterns of Caribbean migration." *Revista Notas de Poblacion*, Special Issue (2001): 20-32.

Non-Refereed

* **R. Ahmad**. "Jamaica, Port Royal Mountains, and Kingston and St Andrew: physical environment and natural hazards." Publication No. 5, Unit for Disaster Studies, Department of Geography and Geology, UWI, Mona (21 pp.).
* P. Allsworth-Jones, G. Lalor, G. Lechler, **S.F. Mitchell**, E. Rodriques & M. Vutchkov. "The Taino settlement of Kingston." *Proceedings of the XVIII Congress for Caribbean Archaeology*, St George's, Grenada, July 11-17, 1999.

* **E. Thomas-Hope**. "Trends and patterns of migration to and from Caribbean countries." *Proceedings of the Symposium on International Migration in the Americas*, San Jose, Costa Rica, September 4-6, 2000: 37-59.

* **E. Thomas-Hope** "Foreword," in J. Maxwell, *How to Make Our Own News: A Primer for Environmentalists and Journalists*, Canoe Press, UWI, Kingston, 2000: vi-vii.

* **E. Thomas-Hope** "Similarities and variations in the pattern of Caribbean migration." *Proceedings of the International Training Seminar on International Migration Policy*, Kingston, May 30-June 1, 2001: CD ROM.

* **E. Thomas-Hope**, K. Johnston & A.D. Jardine-Comrie. *Resource Valuation of the Ocho Rios Marine Park*, UWI, Mona, 2001, 97pp. (with assistance from G. Gibison & K. Russell).

PUBLIC SERVICE

R. Ahmad

- Caribbean correspondent to the International Landslide Research Group;
- Member, National Damage Assessment, Recovery and Rehabilitation Subcommittee;
- Member, Steering Committee for Community Disaster Management Strengthening Project, Officer of Disaster Preparedness and Emergency Management.

W. Bailey

- Chief Examiner, CAPE Geography;
- Convenor of the Geography Panel, CAPE;
- Member, UNESCO Social Science Committee;
- Faculty representative, Colloquium on Crime.

D. Barker

- Editor, *Caribbean Geography*.

T. Jackson

- Honorary University Fellow, Camborne School of Mines;
- Member, Jamaica National Commission for UNESCO, Science and Technology Advisory Committee;

- Member, Permanent Standing Committee, Caribbean Geological Conference;
- Member, Jamaican IGCP Committee;
- Member, Caribbean Community Ocean Science Network (CCOSNET).

D. Miller

- Book Review Editor, *Caribbean Geography*;
- Secretary, Jamaican Association of Geomorphologists.

S. Mitchell

- Chairman, Commission on Jamaican Lithostratigraphy;
- Member, Technical Working Group on Jamaican Beach Policy;
- Editor, *Contributions to Geology*, UWI, Mona;
- Editor, *Journal of the Geological Society of Jamaica*;
- Council Member, Geological Society of Jamaica;
- Staff representative, Council of the UWI [Students] Geological Society.

E. Robinson

- Member, Scientific Board, International Geological Correlation Programme (IGCP), UNESCO/IUGS, Paris;
- Member, Jamaican IGCP National Committee;
- Member, Editorial Board, *Caribbean Marine Studies*;
- Vice-President, Jamaican Association of Geomorphologists;
- Member, Standing Committee for Caribbean Geological Conference Series;
- Member, Advisory Committee on Coastal Erosion, NRCA;
- Courtesy Professor, Florida International University, Miami.

T. Stemann

- Council member, Geological Society of Jamaica;
- Chairman, Field Trip Committee, Geological Society of Jamaica.

E. Thomas-Hope

- Chairman, Board of the Jamaica Sustainable Development Network;
- Member, Tribunal of the NRCA Act of the Ministry of Environment and Lands;

- Director, Board of the Luis Fred Kennedy Environmental Foundation;
- Director, Jamaica Institute of Engineers Foundation;
- Member, advisory panel to the Health and Environment Project on Setting an International Agenda for Health and the Environment, 1998-2000;
- Journal referee for *Third World Planning Review*, *The Journal of Eastern Caribbean Studies*, and *Progress in Development Studies*;
- Member of the Editorial Advisory Boards of *Third World Planning Review*, *Caribbean Geography*, *The Caribbean Journal of Agriculture and Natural Resources*, *The International Journal of Disability Issues*, and *Progress in Development Studies.*

CATEGORIES OF STUDENTS

Undergraduates: Geography

Course		Regd	Sat	Passed	%Passed
GG10A	Introduction to Human Geography	81	80	52	65
GG10B	Introduction to Physical Geography	69	66	45	68
GG20C	Geography of the Caribbean	31	31	28	90
GG21A	Urban Geography	48	48	47	98
GG21B	Geography and Development	37	37	28	76
GG22A	Geosphere and Hydrosphere	51	51	39	76
GG22B	Atmosphere and Biosphere	48	48	41	85
GG31B	Global Economic Structure and Process	14	14	14	100
GG31C	Tropical Agricultural Systems and Development	20	20	17	85
GG31D	Global Structure and Political Order	9	9	9	100
GG32A	Geomorphic Processes and Landforms	15	15	14	93
GG32C	Global Issues in Climate Change	8	8	8	100
GG32D	Health and Society	18	18	17	94
GG33B	Urban and Regional Planning	23	23	23	100
GG33F	Introduction to Geographical Information Systems	41	41	38	93
GG33G	Disaster Management	24	23	22	96
GG33H	Environmental Resource Management	21	21	20	95
GG360	Research Paper	28	23	23	100

Undergraduates: Geology

Course		Regd	Sat	Passed	% Passed
GL10A	Introduction to Earth Sciences I	31	30	29	97
GL10B	Introduction to Earth Sciences II	26	26	23	88
GL10C	Earth Resources and the Environment	16	15	13	87
GL21A	Palaeontology	28	28	25	89
GL22A	Sedimentology	26	26	22	85
GL23B	Igneous Petrology	24	24	21	88
GL24B	Metamorphic Petrology	21	20	20	100
GL25A	Geological Mapping and Map Interpretation	28	27	23	85
GL30D	Analysis and Management of Geohazards and Risks	10	10	10	100
GL311	Field Geology	21	21	19	90
GL32A	Caribbean Geology	20	20	18	90
GL33A	Engineering Geology and Hydrogeology	12	12	11	92
GL34A	Advanced Sedimentology and Fossil Fuels	21	21	18	86
GL35A	Advanced Palaeontology	11	11	10	91
GL36A	Applied Geophysics	12	12	11	92
GL38B	Economic Geology	15	15	14	93
GL39B	Plate Tectonics and Structural Analysis	12	12	12	100
GL39K	Quaternary Geology and Environmental Change	10	9	7	78
GL39L	Environmental Geology and Management	15	14	13	93

Undergraduate Prizes Awarded

The Barry Floyd Prize for the best student in Level I Geography was awarded to **Adrian Lyew-Ayee.**

The Barry Floyd Prize for the best student in Level II Geography was awarded to **Laura John.**

The Geological Society of Jamaica Scholarship was awarded to **Sherene James.**

The Harry Kuarsingh Memorial Bursary was awarded to **Tricia Alvarez.**

Postgraduates: Environmental Management

Twenty candidates completed the **MSc** degree in Natural Resource Management – Integrated Urban and Rural Environmental Management.

Commonwealth Split-Site Postgraduate Scholarships

Three PhD candidates in the Department were awarded scholarships to spend a year at a university in the United Kingdom: Corin Bailey (Geography) at Queen Mary and Westfield College, University of London, and Therese Ferguson (Environmental Management) and Gavin Gunter (Geology) at the University of Liverpool.

DISTINGUISHED VISITORS

Professor R. Abbott, Appalachia State University, USA.

Dr Philippe Bruillet, University of Bordeaux, France.

Professor G. Draper, Florida International University, USA.

Professor D. Morgan, Massachusetts Institute of Technology, USA.

Professor B. Oostdam, Millersville University, USA.

Dr T. Steuber, Ruhr-Universitaet Bochum, Germany.

DEPARTMENT OF LIFE SCIENCES

Ralph D. Robinson PhD *Belfast* **– Head of Department**

WORK OF THE DEPARTMENT

Following some restructuring of its final year program last year, students responded positively to the new Majors in **Pest Management and Plant Protection** and **Environmental Biology.** However, interest in the new **Microbiology** Option (taught jointly with the Biochemistry Section of the Department of Basic Medical Sciences) was less than anticipated. The first year courses, Cells, Biomolecules & Genetics and Introductory Microbiology, also taught jointly with Biochemistry, attracted complaints from several students, mainly regarding laboratory operations, and these require urgent attention in the coming year.

The Department agreed to introduce two BSc minors, **Botany** and **Zoology,** each representing 16-advanced credits, which could be taken jointly with several other majors in the Faculty, and which would appear on the degree parchment.

Dr Ralph Robinson Chaired the Organising Committee of the Fifth Conference of the Faculty of Pure and Applied Sciences at which staff and students in the Department contributed 21 papers. At the request of the Dean, Dr Robinson also prepared a draft syllabus of a new Faculty-wide BSc Option: Science, with Media and Communication expected to be taught jointly with The Caribbean Institute of Media and Communication (Faculty of Arts and Education).

Brochures that provided information, at-a-glance, on the various offerings in the Department received strong approval from students and were again available in time for registration. The Department's web page, to be found at http://wwwlifesci.uwimona.edu.jm:1104, continues to be maintained by **Dr Peter Vogel.**

The Department's custom of inviting "coffee Guests" continued as a regular Thursday morning feature. Guests, academic staff and graduate students availed themselves of the opportunity of sharing information in an informal setting about their respective roles, and how these relate to the University and the wider society. **Dr Mona Webber** has organised the very successful series for the past three years.

The annual Departmental Retreat examined several initiatives in teaching and research – employment of multimedia technologies in teaching and graduate student training; use of the internet in teaching and research;

and the consolidation of the Department of Life Sciences as a recognised, integrated research entity – received strong support from staff. The establishment of a conducive operating environment and the need for greater student involvement in practical-based projects in the Department also received support. Involvement of selected Private Sector organisations and follow-up information on student placement post-graduation would assist the Department in preparing offerings that reflect national and regional needs.

Preparations for the Department's participation in the University-wide MSc in Environmental Studies are complete, but concerns exist as to the availability of funding for the program, scholarships for students, etc. The Department is of the opinion that it should mount its own MSc, in the general area of Environmental Biology, whether the former program materialises or not.

The Department participated visibly in the Principal's Research Day 2000 "Strengthening the Tourism Product" by way of a series of posters and multimedia displays in the Assembly Hall. We attempted to merge our ecological research and commitment to conservation of the natural environment with the national tourism product. Life Sciences' also contributed several posters and displays at meetings of several Community-based Conservation groups across the island.

A two-day, in-house seminar allowed those graduate students, who had not previously done so, to made oral presentations of their work to the Department.

A Professional Services Purchase Agreement with New Brunswick Community College - Miramichi, signed in February 2001, was completed. It involved **Drs Peter Vogel** and **Eric Garraway** in development of courses in "Wildlife Management" and "Applied Forest Ecology" for the College.

A **Letter of Intent** that agreed to cooperation on the biological control of weeds was signed between the Plant Protection Research Institute of the Agricultural Research Council of South Africa and the Department of Life Sciences.

Student response to the Academic Advisor program was again disappointing, with few staff members reporting useful episodes of academic counseling.

Plant and vehicles

The exterior of the Department received a much needed paint job. During the course of the year, the Biology Lecture Theatre (BLT) was fitted with advanced multimedia hard- and software. Months after installation, however, the work has not been completed. On-line access *via* the Internet in

the BLT is anticipated in the next academic year. The Department has yet to benefit from refurbishment of toilet facilities that began last year in the Faculty.

A new Mitsubishi L200 4x4 twin-cab pickup was funded from the Board for Graduate Studies & Research. This vehicle will be used, primarily, by graduate students in the Department for field based-research. Two older vehicles, twin-cab Nissan and Isuzu pickups, were sold through the Bursary and have been replaced with a new Mitsubishi 4-wheel-drive pickup. The Departmental Land Rover, used for high mountain expeditions, continues to be a major expenditure in terms of maintenance.

The roof of Botany Laboratory #2, replaced under the IDB Loan Scheme, had to be repaired with a grant from the University following severe leakage that resulted from poor workmanship. Hurricane shutters were provided also by The University for the Combined Biology Building.

The wooden dock at the Marine Laboratories housed at Port Royal was replaced with cast concrete, also with a grant from the University, and problems with termites in several laboratories required major intervention. The 18-feet long Boston Whaler™ and safety equipment, acquired last year, have been widely used and continue to function well. The possibility of relocation of the laboratories, resulting from plans to develop Port Royal remains. In the mean time, in association with the Office of Finance, it has been agreed to landscape the site using coconut palms and bougainvillea. The arrangements under which the UWI Shrimp Project uses The Port Royal Marine Laboratory have been clarified to the satisfaction of the Department following discussions with the Office of Finance and the Vice Chancellor.

The Department continued to support the development of the Natural Products Institute, headed by one of its former staff, Prof. Ajai Mansingh, and continues to provide office space for its operation.

Staff Matters

Dr Ralph Robinson was appointed as Head of Department for three years. **Dr Phyllis Coates-Beckford** enjoyed sabbatical leave for the year, during which time she published a paper in *Tropical Agriculture,* submitted another to the same journal and attended several workshops to expand teaching and research capabilities. The Department enjoyed an excellent working relationship with the newly appointed Dean of Faculty, **Professor Ronald Young** who, as Professor of Human and Comparative Physiology, will be formally associated with the Department of Life Sciences.

Congratulations are extended to **Dr. Dale Webber** on the award of a **Musgrave Silver Medal in Science.**

Dr Eric Hyslop, Senior Lecturer in the Department was re-appointed on indefinite tenure. **Dr Ralph Robinson** and **Dr Eric Hyslop** were promoted above the Bar on the scale for Senior Lecturer. **Dr Paula Tennant** (formerly a Research fellow in the Biotechnology Centre) joined the academic staff of the Department as Lecturer in Molecular Biology/Virology.

Several responses to advertisements for positions in Forest Ecology and Pest Management were received, and **Dr Dwight Robinson** will join the Department as Lecturer in Pest Management in the next academic year. **Dr Dunbar Steele,** the first Head, Department of Life Sciences, and former Head of the Department of Zoology will retire on September 30th 2001 following thirty four (34) years of service to The University. The position will be filled, in the first instance, with a Conservation Biologist and **Dr Byron Wilson** is expected to join the Department early in the next academic year.

Several members of staff benefited from information technology and multimedia workshops run by the INFOCOM Centre, and professional workshops at the Instructional Development Unit offered by the Faculty of Arts and Education.

A **Memorandum of Agreement,** between the Faculty of Agriculture and Natural Sciences (St Augustine) and the Faculty of Pure and Applied Sciences (Mona) saw **Mr David Hutton,** Head of the Agriculture Unit (Mona) appointed an Honorary Lecturer in the Department.

Vacancies in the teaching establishment were filled using temporary staff; **Dr Marcia Blair** was appointed Temporary Lecturer for Level III courses in Parasitology and Pest and Pesticide Management, whilst **Mr. Fredrick Boyd** taught mainly in the Biology program as a Temporary Assistant Lecturer. **Miss Metz Peterkin** and **Mrs. Celia Jackson** were appointed as Teaching Assistants to work with large first year classes. **Mr Hugh Lounges** was re-appointed as Systems Manager in the Department. **Miss Karlene Anderson,** Secretary in the Department, was on leave for six months and was competently replaced by **Mrs Sharon Robinson.**

Throughout the year, we had difficulty in identifying technical staff worthy of appointment in the Department. **Miss Elaine Campbell** was exceptional, and was duly appointed Laboratory Technician in our Molecular Biology/Virology Laboratory. One of our younger members of technical staff, **Mr Wayne Straughan,** was promoted to Laboratory Technician from Junior Laboratory Technician.

The Department actively supported research work conducted by academic staff. Several projects involving graduate students received support from The Board for Graduate Studies and Research. Unfortunately,

the time and effort that goes into original investigations does not always reflect in the publication output in the Department. For the most part, the major research topics in the Department were of an applied nature.

RESEARCH IN PROGRESS

Mr Karl Aiken

- use of otoliths in aging selected species of commercial marine fishes
- assessment of wetland fisheries

Dr Marcia Blair

- investigations of the effects of pesticides on somatic development

Dr Jane Cohen

- tree-crop interactions in a contour hedgerow agroforestry system
- soil conservation in hillside yam farming
- propagation of trees for use in reforestation in Jamaica

Dr PV Devi Prasad

- salt stress on pepper and amaranth
- biofertilisers for rice and vegetables
- horticulture of anthuriums and orchids

Prof. Brian Freeman

- insect biodiversity of temperate woodlands
- population dynamics of bark beetles
- bionomics of the lane snapper

Dr Eric Garraway

- ecology and conservation of Jamaican butterflies and moths
- ecological studies of the brown citrus aphid and citrus leaf miner
- conservation of Jamaican manatees

Prof. Ivan Goodbody and Mrs Charlotte Goodbody

- diversity of ascidians, sponges and deep sea animals contained in the department's reference collection

Dr Eric Hyslop

- ecology and management of riverine systems
- construction of bioindices for Jamaican rivers

Dr Ralph Robinson

- human public health importance of rat lung worm infections that may result in meningitis in humans
- eco-parasitological studies of the small Indian mongoose
- interactions between seawater-cultured tilapia and parasitic flatworms

Dr Dunbar Steele

- mariculture of red hybrid tilapia in cages
- ecology of the green mussel in Kingston harbour

Dr Paula Tennant

- development of transgenic papaya for the control of ring spot virus
- safety of genetically modified foods

Dr Mark Thomas

- physiological studies that investigate embryonic exposure and levels of growth factor in oxidative stress
- the physiology of violence

Dr Kisan Vaidya

- genetic studies to produce photoperiod-insensitive and high yielding cultivars of sorrel
- genetic inheritance studies of mungbean and sorrel

Dr Peter Vogel

- ecology and conservation of Jamaica's terrestrial vertebrates and their habitats
- assessment of the parrot population in the Cockpit Country
- an analysis of the influence of habitat quality on bird composition in the dry forest life zone
- the revealing of predation on rare and endangered species by an exotic predator
- documentation of repatriation of head-started Jamaican Iguanas as an effective tool in the conservation of the critically endangered species

Dr Dale Webber

- oceanography and coastal water quality assessments
- environmental management planning

Dr Mona Webber

- zooplankton communities in mangrove lagoons and as ecological markers of water quality
- ecopath modeling at Discovery Bay Marine Laboratory
- biodiversity of the Port Royal mangroves
- anthropogenic stress on mangrove forests and on deep and shallow reefs

Dr Byron Wilson

- ecology and conservation of the Jamaican Iguana and other lizards
- effect of exotic predators on Jamaican dry forest fauna

PAPERS PRESENTED

Aiken KA

- "A preliminary assessment of the fishable resources of Jamaica's largest bay, Portland Bight (Old Harbor Bay)" 53rd Annual Meeting of Gulf & Caribbean Fisheries Institute, Gulfport, Mississippi, USA, November 2000
- "Management of the Jamaican stock of Queen conch, *Strombus Gigas"* Presented at a special Meeting of the National Council on Ocean and Coastal Management, Ministry of Foreign Affairs & Foreign Trade, Kingston, March 2001
- "Aspects of reproduction, age and growth in the lane snapper **(***Lutjanus synagris* Linnaeus, 1758**)** in Jamaican coastal waters". Proceedings of the Gulf & Caribbean Fisheries Institute 52:116-134, November, 2002.

Ruddock S and Hyslop EJ

- "Biomonitoring of lower Rio Cobre using zooplankton and benthic macroinvertebrates as indicators of pollution". Annual Conference of the Caribbean Academy of Sciences, 4-9th June, 2001, Georgetown, Guyana.

The following presentations were made at the Fifth Conference of the Faculty of Pure and Applied Sciences, The University of the West Indies, Mona, January 2000.

Barnes NG, Lalor G Vutchkov and E. Hyslop

- "An assessment of the bio-accumulation of copper and other associated heavy metals by *Thiara granifera*, a freshwater gastropod from the Elim river system, St. Elizabeth, Jamaica".

Bent SM and E.J. Hyslop.

- "A study of the benthic macroinvertebrate community in the estuarine region of selected Jamaican rivers".

Bramwell NA. and Webber, M.K.

- "*Thalassia testudinum* as a bio-indicator in Discovery Bay, Jamaica".

Caleb L. and P. Vogel

- "Niche separation among frogs and crabs rearing offspring in Bromeliads".

Daley LP, D. Lewis, B. Wilson, P. Vogel and R. Robinson

- "A comparative study of the enteric parasitic fauna of the Small Indian Mongoose (*Herpestes auropunctatus*) from an area of human disturbance and adjacent undisturbed area in St. Catherine".

Douglas L and P. Vogel

- "Impacts of habitat degradation on birds breeding in the life zone of tropical dry forests".

Edwards PE and D.F. Webber

- "Mangrove, sea grass and coral reef community interactions of the Falmouth coast; north west Jamaica".

Gittens L, Oxenford H & Aiken KA

- "An investigation of the current status of spiny lobster fisheries in Jamaica".

Gordon T and E.J. Hyslop

- "Observations on the diet of various species of grey mullet (Mugilidae) from the south coast fishery, Jamaica".

Hoo LS and E.J. Hyslop

- "First report of the occurrence of a population of *Gambusia affinisholbroki* (Girard 1854) in Jamaican freshwaters and an examination of aspects of the benthic macroinvertebrates of the upper Rio Cobre".

Jackson CPJ, Webber MK & Steele RD

- "Taxonomy and ecology of sponges in the Port Royal Mangroves".

John K and E. Hyslop

- "Biomonitoring of the North Elim river Jamaica: changes in the benthic macroinvertebrate community with reduced levels of heavy organic pollution (dunder)".

La Hee J., E. Hyslop and D. Webber

- "The effects of rum distillery effluent on the periphytic diatom community of the North Elim river St. Elizabeth, Jamaica with special reference to community change as a response to river recovery".

Levy J. M. Haley and E. Hyslop.

- "Ontogenetic change in the diet of Acanthuridae from Discovery Bay, Jamaica".

Lewis D., B. Wilson and P. Vogel

- "Diet of the Indian Mongoose in a primary tropical dry forest".

Ruddock S and E. Hyslop

- "Biomonitoring of the lower Rio Cobre St. Catherine, Jamaica, using macroinvertebrates and zooplankton as indicators of organic pollution.

Shakes S, G. Lalor, G Vuchkov and E. Hyslop

- "Freshwater thiarid snails as biological monitors of aluminium levels in the Rio Cobre river".

Tabanor ME and E.J. Hyslop

- "The effects of exposure to endosulphan on the growth and reproduction of two species of Thiaridae (Gastropoda)".

Vuchkov MK, Lalor, GC, Allsworth-Jones P, Bailey W, Greenaway A, Hyslop E, Kahwa I & Robinson E

- "Application of the nuclear analytical facilities at ICENS to research in natural sciences".

Wilson BS and P. Vogel

- "Status of the Jamaican Iguana: an assessment of a 10-year conservation programme".

PUBLICATIONS

Refereed papers

* **Cohen, JE,** LR Ogle & PL. Coates-Beckford (2000). "Effects of plastic mulches on the levels of N, P and K in soil and leaves of cucumber (*Cucumis sativus* L.)". *Tropical Agriculture* 77: 207-212.
* **Tennant PF,** Fermin G, Fitch MM, Manshardt RM, Slightom JL & Gonsalves D (2001). "Papaya ringspot virus of transgenic Rainbow and SunUP is affected by gene dosage, plant development and coat protein homology". *European Journal of Plant Pathology* 107: 645-653.
* **Vogel, P.** (2000). Jamaican Iguana (*Cyclura collei*). In: Allison Alberts (ed.), "Status Survey and Conservation Action Plan: West Indian Iguanas". *International Union for the Conservation of Nature*, pp. 19-22.
* **Wilson, B.S.** and P. Vogel (2000). "A survey of the herpetofauna of the Hellshire Hills, Jamaica, including the rediscovery of the Blue-tailed Galliwasp (*Celestus duquesneyi* Grant)". *Caribbean Journal of Science* 36: 244-249.

Non-refereed papers/Technical reports

* **Aiken, KA** (2000). "The marine fisheries of Jamaica". *Naga ICLARM Quarterly* (Manila) 23: 16-35
* **Tennant PF** & Ahmad MH (2001). "Recent advances in the control of papaya Ringspot Disease". *CARAPHIN News* 21: 3-5.
* **Webber, DF** (2000). "Towards the Management of the Black River Morass (RAMSAR Site) – Gathering biological, Social and Economical Data". Report to the NRCA. 87pp.

PUBLIC SERVICE

Mr Karl Aiken

- Member, Select Committee on Economy & Production, Gordon House, Kingston
- Member of the Board of Directors, Jamaica Conservation & Development Trust

- Member of the Board of Directors, Caribbean Coastal Area Management (CCAM) Foundation
- Member of the Scientific Authority, Convention and International Trade in Endangered Species of Flora & Fauna (CITES), Jamaica

Dr Ralph Robinson

- Fellow, Royal Society of Tropical Medicine and Hygiene, UK
- Member, Board of Directors, Jamaica Agricultural Development Foundation.

Dr Kisan Vaidya

- Member, Gene Bank Committee, Jamaica

Dr Peter Vogel

- Member of Board, Scientific Authority
- Chairman, Jamaican Iguana Research and Conservation Group
- Member of Alien Invasive Species Working Group
- Member of IUCN West Indian Iguana Specialist Group
- Member of Executive Committee and Immediate Past President, BirdLife Jamaica
- Member of NRCA Game Bird Committee
- Member of Scientific Advisory Committee, Blue and John Crow Mountains National Park
- Member of Advisory Board, Natural History Division, Institute of Jamaica
- Member, Society of Caribbean Ornithology

Dr Dale Webber

- Chairman, CL Environmental Ltd
- Vice President, Mona Preparatory School Parent Teachers Association
- Advisor, Mona Preparatory School Science Club.
- University of the West Indies Representative on Ministry of Education and Culture Overseas Examination Board.
- Member, Operations Sub-Committee, Overseas Examination Board.
- Member, Science and Technology Advisory Committee of the National Commission for UNESCO.
- Member, North St. Andrew (NSA) Kiwanis Club.

Dr Mona Webber

- Advisor, Institute for Excellence in Environmental Education
- Member, Steering Committee, Sea Turtle recovery Network, Hope Zoo
- Member, American Society of Limnology and Oceanography
- Associate, Harbor Branch Oceanographic Institute
- Member, Association of Marine Laboratories of the Caribbean

CATEGORIES OF STUDENTS

Undergraduate

A breakdown of Bachelor of Science degrees:

First Class Honours	6
Upper Second Class Honours	27
Lower Second Class Honours	18
Pass	1

Performance in courses:

Course Code and Title	Regd	Sat	Pass	% Pass
BB10A Cells, Biomolecules and Genetics	189	187	164	87
BB10B Introductory Microbiology	189	175	155	82
BL05A Preliminary Biology I	109	103	77	71
BL05B Preliminary Biology II	109	100	61	56
BL10L Animal Diversity	130	127	113	87
BL10M Plant Diversity	137	135	126	92
BL20M Mycology	59	58	52	88
BL20N Ecology	70	70	64	91
BL20J General and Molecular Genetics	32	31	28	88
BL20K Population Genetics & Evolution	70	70	60	86
BL30J Soil Microbiology	4	4	4	100
BL38A Virology	21	21	16	76
BL39A Statistics for Biologists	42	38	38	90
BL39C Research Project	11	11	11	100
BL39D Caribbean Biodiversity	11	11	11	100
BL39E Conservation Biology	29	29	27	93
BL39F Environmental Assessment & Management	25	25	25	100
BL39G Environmental Seminar Series I	10	10	10	100

BT21A	Biology of Lower Plant Groups	50	50	47	94
BT21B	Seed Plants	28	27	24	86
BT22A	Plant Physiology	52	52	49	94
BT31A	Phycology	14	14	12	86
BT31C	Biology of Coastal Plant Communities	21	21	21	100
BT32A	Crop Physiology	23	23	22	96
BT34A	Crop Genetics	3	3	3	100
BT38B	Plant Biotechnology	11	11	11	100
Z20C	Functional organization of Animals	65	65	56	86
Z30G	General Parasitology	17	17	17	100
Z30H	Applied Parasitology	7	6	5	71
Z30J	Comparative Animal Physiology	11	11	11	100
Z30M	Immunology	16	16	15	94
Z30N	Developmental Biology	8	7	7	88
Z31C	Fish Biology	17	17	15	88
Z31E	Marine Ecology	24	24	24	100
Z31F	Fisheries & Aquaculture Technology	9	8	8	89
Z32C	Insect Biology & Systematics	4	4	4	100
Z32E	Applied Ecology Entomology	2	2	2	100
Z32F	Management of Pest & Pesticides	3	3	3	100
Z33C	Behavioural Ecology of Animals	13	12	12	92
Z33D	Freshwater Ecology	31	31	31	100

Postgraduate

Registration:

MPhil program	49 full time; 23 part time
PhD program	1 full time; 5 part time

Award of Higher Degrees:

MPhil Botany

Kerrine McDonald-Senior	Supervised Dr Dale Webber and Dr Mona Webber

MPhil Zoology

David Barrett.	Supervised by Dr Dunbar Steele
Nikki Bramwell	Supervised by Dr Mona Webber
Margelette Ellis-Tabanor	Supervised by Dr Eric Hyslop
Deborah Henry	Supervised by Dr Eric Garraway

Carla Thomas	Supervised by Prof. Ajai Mansingh
Dion Witter-Newell	Supervised by Prof. Ajai Mansingh

Prizes Awarded

The following students were formally recognised for quality academic performance:

Prelimininary Biology	CARNEGIE, Jason Richard
Introductory Biology	MILLER, Ricardo Dwaine LYEW-AYEE, Adrian
Don Skelding prize (Botany)	MILLER Ricardo Dwaine
Level II Zoology	BEDASSE, Aisha Kim
Vincent McKie Zoology prize:	BENNETT, Kerri-Ann
Lloyd B. Coke Prize (Plant Physiology)	LANIGAN, Andrea Christine

DISTINGUISHED VISITORS

Professor Peter Calow, University of Sheffield, UK

Mr. Michiyuki Takahashi, Japan International Cooperation Agency, Santo Domingo, Dominican Republic

Mr. Kazuo Senga, Caribbean Fisheries Training and Development Institute/JICA, Port of Spain, Trinidad & Tobago

Dr. John F. Caddy, FAO Fisheries Department, Rome, Italy

Dr. Nick Willoughby, Fisheries & Coastal Zone Division, Natural Resources Institute, Kent, United Kingdom

Mr. Gonzalo Cid, Centre for the Study of Marine Policy, University of Delaware, USA.

Mr Micah Davis, General Manager, UWI and Mona Cooperative Credit Union

Mrs Janet Conie, Banana Board Research Department

Mr Jan Auman, Chairman CWIP

Dr Barbara Carby, Director, ODPEM

Dr David Smith, (then) Director, JCDT

Dr Susan Koenig, Winsor Research Station

Dr Paul Ivey, Dean of Science, CASE

Ms Paula Hurlock, Dolphin Head Trust

Field Trip Activity – Z31F: *Fisheries and Acquaculture Technology class members observe artisan making Fish Trap at Old Harbour Bay, St. Catherine, November 2, 2001.*

Z31C Fish Biology: *Class assembled at Port Royal Marine Lab prior to embarkation on boats to study Kingston Harbour Fishes. September 2001.*

Mr Mike Robinson, Hofstra Marine Laboratory

Mr Ian Gage, Environmental Foundation of Jamaica

Field Trip Activity – Z31F: *Fisheries and Acquaculture Technology class members observe Fish Culture Raceways at Longville Park Fish Farm, Freetown, St. Catherine, November 9, 2001.*

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

John Lodenquai, BSc *UWI,* **MA, PhD** *Columbia* **– Head of Department**

WORK OF THE DEPARTMENT

The Department introduced a new programme at the graduate level in 2000 – the MSc in **Biostatistics,** a one-year, full-time programme operated in collaboration with the **Tropical Medicine Research Institute (TMRI)** and the **Medical University of South Carolina (MUSC)** and funded partially by the **National Institutes of Health (NIH)** of the U.S. The two mathematics majors selected for this inaugural programme, **Mr. R.**

Patterson and **Ms. C. Walters,** have recently returned from a six-month stay at MUSC and are now completing their theses. A member of staff, **Mr. S. McDaniel** spent the summer of 2001 at MUSC in order to acquire the expertise which will eventually be needed to run the entire programme here at Mona by the 2003/2004 academic year.

The CS11A and CS11B (Introduction to Computer Science I and II) syllabuses were significantly reviewed and re-organized by **Professor H. Reichgelt** who made all the material covered in the course available on the World Wide Web for the first time. Two new courses, *Advanced Database Systems and Cryptography* were designed and introduced by **Ms. Lila Ra**o and **Dr. K. Robinson** respectively to the MSc (Computer Science) programme. CS20A, CS36Q and CS37Q were updated and improved by **Dr. D. Coore** during the year.

During the year work was done to refurbish a room in the Mathematics Section in order to convert it to a computer laboratory for students pursuing Level II and Level III courses in Mathematics. This laboratory has been equipped with approximately 20 PCs so far and will be ready for the new academic year.

In October 2000, several members of staff attended the **National Conference for Mathematics Teachers,** co-hosted by the Faculty. Presentations were made by **Dr. R. McEachin, Dr. R. J. Minty, Dr. A. Rodkina and Dr. W. B. Zhang.**

In July 2001, **Professor L. R. B. Robinson** hosted a farewell function at his home on behalf of the Department for **Dr. R. J. Minty** who has returned to England after 6 years of dedicated service to the Department. **Dr. Alexandra Rodkina** was promoted to Senior Lecturer while **Mr. Ashley Taylor** was granted an extension of his leave to continue with his PhD studies in Computer Science in the U.S. The Department continued to be short-staffed during the year, forcing us to rely on the services of part-time lecturers. However, steps were taken to try to alleviate this situation.

RESEARCH IN PROGRESS

Dr. D. Coore

- Amorphous Computing.
- Cardiac Surgeon Trainer

Dr. L. Henry

- Sprays on tangent bundles and the differential equations for which they are the generators of symmetry groups.

Dr. E. Mugisa

– Component-based software engineering.

Prof. H. Reichgelt

– Data warehousing and data mining.

Dr. A. Rodkina

– Stochastic Processes.

Dr. W. B. Zhang

– Analog of the Halberstam-Elliott conjecture for rational function fields over finite fields.

– Converse prime number theorems.

PAPERS PRESENTED

Rodkina, A.

- "On stabilizations of Hybrid Stochastic Systems", International Conference on Dynamics of Continuous, Discrete and Impulsive Systems. London, Ontario, Canada. July 27-31, 2001.

Zhang, W.B.

- "Local Theorems of Additive Functions on Additive Arithmetical Semigroups." International Conference of Mathematics, Beijing, China. December 18-22, 2000.
- "Central Limit Theorems on Additive Arithmetical Semigroups." Fifth Joint Conference of the American Mathematical Society and the Mexican Mathematical Society (AMS-SMM), Morelia, Mexico. May 23-26, 2001.

PUBLICATIONS

* **Reichgelt, H. "**Software Engineering Services for Export and Small Developing Countries". Information Technology for Development, 9(2), 77-90 (2000)
* Abernethy, K., Gabbert, P. and **Reichgelt, H**. "Information Technology Training in Developing Countries: A Case Study." 7th World Conference on Computers in Education, Cpenhage, Denmark (2001).
* Abernethy, K. and **Reichgelt, H. "**Building a Software Development Industry in Jamaica: Lessons Learned." Computers and Advanced Technology in Education, Banff, Canada, 189 – 192 (2001).

* **Rodkina, A.,** Mao, X. and Kolmanovskii,V. "On Asymptotic Behaviour of Solutions of Stochastic Difference Equations with Volterra Type Main Term". Analysis and Appl. 18, no.5, pp.837 – 857 (2000)
* **Rodkina, A.** and Kolmanovskii,V. "On Stability of Hybrid Stochastic Equations. Dynamic Systems and Applications," 9 , pp.541 – 558 (2000)
* **Rodkina, A.** "On Asymptotic Behaviour of Solutions of Stochastic Difference Equations." Proc. Third World Congress of Nonlinear Analysts, Catania, Sicily. Nonlinear Analysis. V47, part 6 (2000)
* **Zhang, W. B.** "Probabilistic Number Theory in Additive Arithmetic Semigroups, II." Math. Zeitschrift, **235,** 747 – 816 (2000)
* Knopfmacher,J. and **Zhang,W.B.** "Number Theory Arising from Finite Fields" (Marcel Dekker, N.Y. 2001)

PUBLIC SERVICE

Dr. L. Henry

– is preparing Volume 12 of the Jamaica Stud Book for the Jamaica Racing Commission.

Professor H. Reichgelt

– Member, National Commission on Science and Technology (NCST)
– Convenor, Caribbean Advanced Proficiency Examinations Information Technology panel, Caribbean Examinations Council
– Chair, Information Technology Board of Studies, University Council of Jamaica
– Convenor, Caribbean Advanced Proficiency Examinations Computer Science panel, Caribbean Examinations Council.

STUDENT MATTERS

During the year the Department had one supplemental and six departmental awardees.

At the Faculty Awards Ceremony, **Miss Anika Jobson** was awarded the **Harold Chan Scholarship** as well as the **Level II Merville Campbell** prize. (Miss Jobson is now on a postgraduate scholarship in Mathematics at the State University of New York at Stony Brook). **Miss Claudia Wallace**

was awarded the **Level I Merville Campbell** prize while **Mr. Sean Newman** received the **University Lodge/Euclid King** prize.

DISTINGUISHED VISITORS

Professor Oleg Bogoyavlenskij of Queens University, Canada

Professor David Avis of McGill University, Canada.

DEPARTMENT OF PHYSICS

Patrick Chin, BSc *Lond-UCWI,* **PhD** *UWI* – **Head of Department**

WORK OF THE DEPARTMENT

Teaching

The undergraduate programme in Levels 2 and 3 was extensively revised and upgraded to take into account the advances in technology and the changes in the needs of the students. Courses at these levels are now four credits each with the exception of one course which remains at the old rating of eight credits. It is hoped that the increased flexibility in the programme will match more closely the career choices of the students.

The MSc in Digital Technology entered its second year and the first set of students should complete this programme at the end of Summer 2001.

The Introductory Physics laboratory, Lecture Room C, the Seminar Room and the Main Office were refurbished to improve the appearance of the physical plant and this exercise is to be carried out in the General Physics laboratories during the next academic year.

Academic staffing continued to be problematic with the departure of both Dr. Igor Peidous and Dr. Claude McNamarah and temporary arrangements have been made to ensure that certain courses continue.On the bright side the department was pleased to note the promotion of **Dr. Anthony Chen** to the post of Professor of Applied Physics.

Dr.Michael Taylor developed a P14A Introductory Physics web page from which students can obtain relevant course information along with past examinations and tutorials.

Research

The Department hosted a 5-day Caribbean Climate Data Workshop in January 2001. This was organized by Dr. Michael Taylor in conjunction with Dr. T.Peterson of the National Climate Data Canter in the USA and jointly sponsored by UWI, WMO, NOAA OGP and NASA.

Data managers from eighteen meteorological services across the Caribbean, representatives of four regional entities interested in Caribbean climate and experts in data quality assessment, climate change and Caribbean climate combined to establish suitable climate change indices and data format for a database which will be accessible to all participating institutions.

Mr. Trevor Hall attended an intensive 3-month course on Climate Modelling at Columbia University during the first half of 2001 and this significantly improved his research capability.

Dr. Michael Taylor underwent individualized training in climate research at the Atmosphere/Ocean/Marine Laboratory (AOML) in Miami, USA in August 2000 and was an invited participant in the Workshop on Climate and Coastal Communities in Hawaii, USA in November 2000. He also attended the conference “Caribbean Observations in a Global Context” in Bridgetown, Barbados in February 2001.

Dr. Joseph Skobla established links with Marconi Canada-BAE Systems from whom a GPS development system was received and Microchip Inc, USA who donated development kits for microcontroller studies.

Dr.Michael Taylor received an IAI-PESCA grant of US$26,000 for a project entitled “When Oceans Conspire: The Effect of Concurrent SST Anomalies in the Tropical Atlantic and Pacific”

RESEARCH IN PROGRESS

Climate Studies

Dr. A. Amarakoon

- Work continued on Enso effects on sugar cane yields in Jamaica.
- Global radiation is being studied using meteorological data.
- The wind energy resources of the island have been modelled and digital maps have been produced to indicate wind speed and power.

Prof. A. Chen and Dr. M. Taylor

- The dynamic link between early season Caribbean rainfall and Atlantic and Pacific sea surface temperature in the year following an El Nino event was investigated using statistical techniques and numerical experiments with a general circulation climate model.

Prof. A. Chen and Ms. T. Stephenson

- The spatial and temporal link between Caribbean rainfall and Atlantic and Pacific sea surface temperature and wind shear is being studied using canonical correlation analysis(CCA).

Prof. A. Chen and Mr. T. Hall

- Work on investigating the correlations between hurricane predictors and late season rainfall and on generating a statistical prediction model

Dr. M. Taylor

- The interannual varaibility of Caribbean climate continued to be examined, with an emphasis on determining the primary forcing factors which drive/cause change.

Electronics

Dr. L. Myers and Ms. S. Williams

- Work is continuing on the analysis and comparison of different types of photovoltaic modules for use under local solar conditions.

Dr. L. Ngalamou and Mr. R. Paharsingh

- A project on hardware compilation for image compression using optimized wavelet and coding algorithms is near completion.

Dr. L. Ngalamou and Mr. C. Donaldson

– The design of a Petri-Fuzzy software tool for discrete event controllers

Dr. L. Ngalamou and Mr. D. Emanuel

– Analysis and synthesis of VHDL cores libraries for high-speed power line transceiver design

Dr. J. Skobla

– A GPS mobile data acquisition system was implemented using a GPS module along with a laptop computer.The experimental data was compared with a Jamaican road map and its accuracy evaluated.

Dr. J. Skobla and Mr. A. Young

– The communication microprocessor board hardware and software for the GPS mobile data acquisition system are now under development.

Astronomy

Prof. J. Lodenquai

– *Spotted-Star Models*:

Investigating the correlation between spotted-star models in binaries and binary period

– *Quantum – Classical Transition*:

The quantum to classical transition is being investigated with the harmonic oscillator being used as the specific example.

PAPERS PRESENTED

A.M.D. Amarakoon

- "Results from a preliminary case study on climate and sugar cane yield in Jamaica" Agrophysics 2000: International Conference; Havana, Cuba (Dec 2000)

A. Chen, D. Amarakoon, M. Taylor and T. Hall

- "Socio-Economic Impacts and Implications for Future Climate Change in the Caribbean" Global Change Open Science Conference, Amsterdam (Jul 2001)

D. Amarakoon and A. Chen

- "A study on wind power in Jamaica" Americas Conference in Wind Engineering – 2001; Clemson, SC, USA (Jun 2001)

L. Myers

- "High Quality Ultra Thin HfO_2 Gate Stack Prepared by In-Situ RT-MOCVD Process" The Electrochemical Society 199th Meeting (Mar 2001)
- "Current Research in Photovoltaics at the UWI Mona Campus" Jamaica Solar Energy Association Seminar, Kingston, Jamaica (Oct 2000)

Lucien Ngalamou and Harold Campbell

- "Diabetic Information Appliance" Proceedings of JamCon 2000, IEEE Ocho Rios, Jamaica (Aug 2000)

Lucien Ngalamou and Patrick Dyer

- "Modelling of an Environmental Control System for Poultry Farms" Proceedings of JamCon 2000, IEEE, Ocho Rios, Jamaica (Aug 2000)

M. J. Ponnambalam

- "Implications of Some Laws of Physics for Society" Summer Meeting, American Association of Physics Teachers, Canada (Aug 2000)
- "Physics Majors Upper-Division Curriculum in Jamaica" Summer Meeting, American Association of Physics Teachers, Canada (Aug 2000)

M. A. Taylor

- "The Caribbean Climate Data Workshop: Successes, Failures, Lessons Learnt". Technical Meeting, Caribbean Observation in a Global Context, Barbados (Feb 2001)

PUBLICATIONS

Refereed

A. A. Chen and A. M. D. Amarakoon

* "Generation of Electricity by Wind Turbines at Munro" *Jam. J. Sc. Tech. 10 53-78, 1999* (May 2001)

Lucien Ngalamou, Andrew Dixon and Daniel Coore

* "Petri Nets-to-VHDL Code Generation" *Proc. Int. Conf. Man Systems and Cybernetics 2001* Orlando, USA (June 2001)

PUBLIC SERVICE

Dr. A. Amarakoon

- Member, Project Steering Committee in Jamaica for the United Nation Framework Convention of Global Climate Change

Dr. A. Chen

- Member, Renewable Energy Committee, NCST
- Member, Drought Management Committee, ODPEM
- Country Representative, Inter-American Institute (IAI) for Global Change Research

Dr. P. Chin

- Commissioner, Broadcasting Commission
- Vice-Chairman, ApplianceTesting and Labelling Committee, Jamaica Bureau of Standards
- Member, Physics Panel, CAPE Examinations

Prof. J. Lodenquai

- External Examiner, Physics, Joint Board for Teacher Education
- External Examiner, Physics, Associate Degree in Natural Science, CASE

Dr. J. McTavish

- External Examiner, Physics, Joint Board for Teacher Education

Dr. M. A. Taylor

- Member, Caribbean Climate Forum Steering Committee

CATEGORIES OF STUDENTS 2000/2001

Undergraduate

Course		No. sat exam	No. passed	Pass rate/%
P04A	Preliminary Physics A	73	60	82
P04B	Preliminary Physics B	78	46	59

P14A	Introductory Physics A	117	77	66
P14B	Introductory Physics B	104	77	74
P23B	General Physics I	15	7	47
P24A	Electronics I	31	26	84
P24B	Electronics II	30	22	73
P33A	General Physics II	4	2	50
P33B	General Physics III	7	6	86
P33D	Environmental Physics	6	6	100
P34A	Electronics III	38	29	76
P34B	Electronics IV	35	26	74

A First Class Degree with Majors in Electronics/Physics was awarded to **Ms. Simone Millwood**.

Prizes

The Departmental Prizes for academic performance in Level 2 courses were awarded to **Ms. Simone Millwood** and **Mr. Akeel Herdsman**.

The Francis Bowen Bursary for Physics was awarded to **Mr. Akeel Herdsman**.

The Florence Sulph/Chance Memorial Bursary was awarded to **Ms. Simone Millwood.**

Postgraduate

Mr. Rudolph Brissett completed his MPhil degree on "Unequal Error Protection Using Convolutional Codes". His supervisor was Dr.Janak Sodha.

DISTINGUISHED VISITORS

Dr. Oscar Arango World Meteorological Organization Regional Office, Costa Rica.

Dr. Victor Rueda Centro de Ciencias de la Atmosfera, UNAM, Mexico.

Prof. Ian Freeston University of Sheffield, UK.