FACULTY OF PURE AND APPLIED SCIENCES MONA

Year ending July 31, 2004

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

Dean's Overview

INTRODUCTION

The year 2003-2004 in the Faculty of Pure & Applied Sciences was characterized by signs of great hope and circumstances of great concern. The situation in both sections of the merged Department of Mathematics and Computer Science remains parlous in terms of staffing and degree of organization and stability. Still, there is great potential and signs of hope that will materialize only with care and attention.

The Faculty in responding to the need for maintaining standards established a Faculty Quality Assurance Committee with initial mandate to monitor closely and give feedback on teaching performance. The Faculty is none-the-less cognizant that this mandate must quickly be expanded to include the monitoring of research standards.

There is a clear realization in all sectors of the Faculty, that our plans to improve our position globally as a university of the first order will be attainable only if we are able to raise the financing to achieve this through non-governmental sources and by improving the efficiency and sustainability of our operations. There is optimism that our goals will be achievable, but the map showing the pathways through which we will arrive at our objectives is still only an outline. The importance of activities directed at generating income for the Faculty and the Campus are starkly highlighted. The diploma, certificate and taught Masters programmes tailored to meet market demands, and the Salt Water Tilapia project from the Department of Life Sciences and Mona Institute of Applied Sciences (MIAS) continue to show great promise. The Natural Products Institute (NPI) also shows progress through screening and characterizing products from innovators who wish to procure appropriate toxicological tests and a scientific basis for claims of efficacy of their products, and through innovative value-added processing of traditional products whose export

market share has fallen for various reasons. All departments in the Faculty have embarked upon additional projects aimed at generating income to compensate for the budgetary shortfalls. The problem is that, in most cases, the delivery of effective results will require significant time and some initial investment before any potential gains will be realized. The fear is that the necessary focus on income generating activity, by diverting man power and ingenuity from our core business, may well impair the very cause that it is intended to further - assisting the UWI to enhance its reputation as a first rate teaching and research institution.

HIGHLIGHTS

Based on the forging of a FPAS driven inter-departmental and cross-faculty consortium of groups offering to engage in the development of natural products for national economic advancement, the Faculty, the PIOJ and other collaborators in December 2003 presented to the National Planning Council a proposal for an integrated, broad-based approach to the Commercialization of Medicinal Plants. The Chairman, the Hon. Minister of Finance, conceded that the presentation was the most thorough and comprehensive that he had heard in his association with the Council. Consequent to this, the Campus in March 2004 signed a MoU with the PIOJ to seek funding for the proposal and to govern the subsequent interrelationships.

Through the initiative of Discovery Bay Marine Laboratory (DBML, **Dr. Norman Quinn**) and the NPI (**Dr. Trevor Yee**) the Faculty held discussions with a research team from the University of Mississippi regarding the acquisition of a major grant from the International Cooperative Biodiversity Group (ICBG) to finance the collaborative investigation of coral reef organisms with potential for yielding new drugs. Work has begun, funded by an ICBG Planning Grant and agreements regulating the working relationships are being forged. Qualification for a comprehensive grant is an encouraging prospect.

Through the initiative of the Department of Geography and Geology the Dean held discussions with Dr. Jeremy Collymore of the Caribbean Disaster Emergency Response Agency (CDERA) on Disaster Management in the Faculty. Subsequently, through the mediation of **Dr. Balfour Spence,** grants for work in disaster management have been garnered by members of the Department from CDERA and the Japan International Development Agency (JIDA).

Drs. Alexandra Rodkina, Wen Bin Zhang, Yvette Jackson and **Mohammed Bakir** were promoted to professorships.

Dr. R. Dunbar Steele who was on a post-retirement contract to steer the salt water Tilapia project and coordinate the Summer School did not seek a further contract. Ms. Patryce Allen also did not seek a renewed contract on termination of her temporary appointments. Several other temporary contracts were not renewed after expiry. Dr. Sasikala Potluri resigned regrettably, for personal reasons.

Professor Tara Dasgupta's Pesticide Research Lab was accorded UNEP designation as a Persistent Organic Pesticide (POP) Analytical Lab. **Professor Ishenkumba Kahwa** received the Gleaner Honour Award in Science & Technology for his work on the Environment and Health, and the Vice Chancellor's award for All-Round Excellence. **Dr. Willard Pinnock** received the Guardian Life Premium Teaching Award for 2003/2004 and the Vice Chancellor's Award for Excellence in Teaching.

The new MSc programme in Plant Production and Protection and the MSc Natural Resource Management specializations in Tropical Ecosystem Management and in Water Resources Management were approved and offered for the first time in 2003/04. The MSc in Computer Science was resuscitated by the Computer Science sub-department in collaboration with the Mona Institute of Applied Science (MIAS) and two new Diploma programmes, a Diploma in Plant Production and a Diploma in Plant Protection, comprising sub-sections of the MSc in Plant Production and Protection, were introduced by the Department of Life Sciences.

At an awards ceremony at the Mona Visitors' Lodge and Conference Centre on January 30, 2004, several members of the Faculty were honoured by the University as outstanding researchers.

Professor Tara Dasgupta of the Department of Chemistry was recognized for the most outstanding research project in the Faculty for his work on *"Mechanisms Involved in the Generation and Reactions of Nitric Oxide."*

Professor Ishenkumba Kahwa, also of the Department of Chemistry, was singled out for having attracted the most research funds for his project on *"National Hazardous Materials and Waste Inventory and Their Management Policy Options."*

Dr Anthony Greenaway's project on *"The Discovery Bay Marine Laboratory Chemical Analytical Facility"* received the award for the most successfully commercialized research project in the Faculty. He, too, is in the Department of Chemistry.

The award for best publication was won by **Dr Michael Taylor** and **Professor Anthony Chen** of the Department of Physics (and a collaborator), for their paper entitled *"Influence of the Tropical Atlantic versus the Tropical Pacific on Caribbean Rainfall."*

Dr Willem Mulder of the Department of Chemistry (and a collaborator) also won a best publication award for their paper entitled *"Theory of the Salt Effect on Solvatochromic Shifts and Its Potential Application to the Determination of Ground-State and Excited-State Dipole Movements."*

SYMPOSIA & WORKSHOPS

In November 2003 the Faculty hosted a symposium on *Science & Technology in Economic Development.* Among the speakers were Jamaicans in the diaspora, Professors Trevor Campbell (Claremont Colleges, California) and Reginald Nugent (California State Polytechnic University at Pomona).

The Chemistry Department hosted the 20th Biennial Mona Symposium on Natural Products and Medicinal Chemistry, chaired by **Professor Paul Reese,** on January 5th to 9th. The Symposium drew its usual wide cross-section of participants.

As a part of the Research Day 2004 activities, the Faculty, with the support of the Principal's Office, hosted a conference on *Science, Technology & Innovation* on January 28th to 30th. The conference, chaired by **Professor Ishenkumba Kahwa,** had representatives from China, South America, North America, South Africa, among other countries. The conference was very successful and subsequent articles on the Chemistry Department in the widely-read journal *Chemical Engineering News* drew attention to the excellent work being carried out in that Department.

With the assistance of the Campus, the Faculty through the Department of Life Sciences and the MIAS, in collaboration with the McGuire Centre, University of Florida, held a two day workshop in June, chaired by **Dr. Eric Garraway,** on *"Utilization and Conservation of Jamaica's Fauna: A Case Study of Jamaica's Butterflies."* Many local organizations were represented including the Ministries of Tourism and Agriculture, TPDCo, NEPA,

JCDT, The Nature Conservancy (Jamaica) and potential investors. It was widely agreed that the ground-work of the Department of Life Sciences in the study of butterflies and moths had been exemplary and that the commercial possibilities were wider than any single group could encompass. The UWI was mandated to co-ordinate the establishment of a Butterfly Farming Working Group to oversee the development of an industry in Jamaica. Follow-up is in progress.

OUTREACH

In November 2003 the Dean along with a team from the Natural History Division of the Institute of Jamaica met with the Minister of Education, Youth and Culture to discuss the parlous state of Science Education in the country and to suggest initiatives which could assist in improving the appreciation of science in the schools and re-invigorating the science competitions. The Minister made several suggestions for follow-up and has suggested that another meeting might be in order. Further correspondence is being prepared.

In November also, the Faculty through the mediation of **Dr. Howard Reid** of the MIAS hosted a group of students from CASE. In May 2004 a group of 9-10 year olds from St. Theresa's Preparatory School toured the Faculty.

In March 2004 the Chemistry Department hosted a 4-day Spectroscopy Workshop for about 400 CAPE students and teachers, under the direction of **Dr. Marvadeen Singh-Wilmot.**

PUBLICATIONS

Compared with 2002/2003, the total staff complement increased by two and refereed publications increased from 98 to 102; per capita output therefore rose to 0.98 compared with 0.96 last year. Non-refereed and conference presentations together again rose this year but only by 17% from 151 last year to 177. Mathematics and Computer Science showed a marked fall partly, perhaps, due to under-reporting. Biotechnology and Life Sciences both rose markedly due to the production of special volumes locally (Biotechnology: 10 articles in an issue of the *Jamaican Journal of Science & Technology* highlighting the work of the Biotechnology Centre) and internationally (Life Sciences: a volume of the prestigious *Bulletin of Marine Science,* edited by Drs Mona and Dale Webber with 18 articles focusing on the work on Kingston Harbour, 14 of which were from Life

Sciences personnel.) A disappointing aspect is that apart from these articles only one other refereed journal article was produced by the Department. The Department of Geography & Geology continues to dominate the teaching departments in output of publications in both refereed (1.4/staff member, down from last year) and non-refereed/ conference presentations.

Department	No. Acad. Staff	Refereed Publicatons	Non-Refereed Publications	Conference Presentations
Biotechnology Centre	5	10+3	–	26
Chemistry 23	30	15	10	
Geography & Geology	8+6	20	4	48
Life Sciences	19	18	1	14
Mathematics & Computer Science	15+8	7	3	5
Physics	14	3 (+1 patent)	2	12
Centre for Marine Sciences	2	6	16	17
Electron Microscopy Unit	2	5	1	1
NPI/MIAS	3	0	0	2
TOTAL:	**104**	**102**	**42**	**135**

UNDERGRADUATE

In 2003/2004 the Faculty registered a total of 1431 students, an increase of 11.8% over the intake in 2002/2003, when 1280 students were on the register (data supplied by the Student Records System). The Table below shows the number of individual courses and total registrations in these courses. Despite having 24 and 18 courses on the books for 2003/04, Geography and Geology respectively seem to have registered students only in 17 and 14 courses. Thus, only in Mathematics and Geology did the course numbers fall, with increases in Computer Science, Geography and Physics, despite admonitions to reduce undergraduate contact hours. The mean number of students per course rose in all cases except in Computer Science.

UNDERGRADUATE

Department	No of Courses	Total Credits	Enrol-ment	Mean No./ Course	Load/Staff Member

Chemistry		24	120	1761	73.4	1.0*	5.2†
Geogr/Geology:	Geog	17	72	754	44.4	2.1	9.0
	Geol	14	64	315	22.5	2.3	10.7
Life Sciences		38	164	2036	53.6	2.0	8.6
Math & CompSci:	CSci	15	64	1337	89.1	1.9	8.0
	Math	26	114	1855	71.3	1.7	7.6
Physics		26	120	1015	39.0	1.9	8.6
TOTAL		**162**	**726**	**9073**	**56.0**	**1.8**	**7.9**

***This column shows load as courses/individual.** **†This column shows load as credits/individual**

In Geology, total registration rose slightly from 305 to 315. With the fall in number of courses offered, the mean number of students per course therefore rose from 18 to 22.5.

	2001/2002		2002/2003		2003/2004	
Level of Degree	**N**	**%**	**N**	**%**	**N**	**%**
First	32	10.9	27	9.4	26	9.5
Upper Second	92	31.4	87	30.4	81	29.6
Lower Second	88	30.1	90	31.5	70	25.5
Pass	32	10.9	37	12.6	35	12.8
Fail	49	16.7	46	16.1	62	22.6
Total Sitting	293	100.0	287	100.0	274	100.0
Total Registered	**1224**		**1280**		**1280**	

Failure rate in the undergraduate final examinations rose from a steady value of about 16% to 22.6%, while the percentage of First Class Honours remained at around the 10% mark. The cause for the rise in failure rate is consistent with complaints that increased intake has been achieved at the expense of a generally lower level of preparedness of the students. A real connection however, has not been demonstrated. A more detailed study of the relationship between entry qualifications and performance will be undertaken.

GRADUATE

In 2003/2004, the Faculty registered a total of 392 graduate students in various programmes, compared with 324 in 2002/2003, an increase of about 21%, with the MSc registrations (up 73%) accounting mostly for the change (excluding MIS students). The total number of research students registered, however, also rose from 242 to 250 (3%). The combined

number of MPhil and PhD (research) students graduating in 2003/04 was just equal to the average of research based students for the two previous years combined suggesting that there is no trend here, despite year-to-year variations.

Graduate

	REGISTERED			GRADUATING		
	2001/02	**2002/03**	**2003/04**	**2001/02**	**2002/03**	**2003/04**
MSc	86+56*	82+73	142+73	21+21	23+21	23+28
MPhil	178	181	188	12	14	15
PhD	42	61	62	5	10	5
Total:	**306**	**324**	**392**	**38**	**47**	**43**

***Half the number of MIS students - credited to the FPAS**

The Geology sub-department still resists the introduction of taught Graduate level courses and the Department of Chemistry evades the issue of taught MSc programmes. In general, the engagement in Graduate teaching is relatively low (mean Courses/Staff member = 0.74) except in the case of Computer Science, in which there were 2.5 courses per staff member with a mean enrollment of 36 students per course. The skew of graduate to undergraduate teaching effort in the Computer Science sub-department continues to be a matter of concern.

Graduate

Department	No of Courses	Total Credits	Enrol-ment	Mean No./ Course	Courses/Staff Member

Chemistry		7	13	199	28.4	0.3†	1.3*
Geogr/Geology:	Geog	12	57	146	12.2	1.5	3.6
	Geol	0	0	0	n/a	n/a	2.3
Life Sciences		14	56	33	2.4	0.74	2.5
Math & CompSci:	CSci	20	68	721	36.1	2.5	4.4
	Math	9	36	14	1.6	0.60	2.3
Physics		6	44	78	13.0	0.42	2.1
TOTAL		**68**	**274**	**1191**	**17.5**	**0.74**	**3.0**

†This column indicates mean number of courses for graduate level only.
***This column indicates mean number of courses including both graduate and undergraduate levels**

GRANTS

Grants reported to have been brought in from external sources fell by 4% to J$79,611,415 from last year's J$ equivalent of $82,853,845, with the total number of grants falling from 46 to 34.

DEPARTMENT	Internal (J$eqlt)*	No. Grants	External (J$eqlt)*	No. Grants
Chemistry	4,069,872	4	17,063,000	9
Geography & Geology	0	0	15,337,000	6
Life Sciences	2,025,500	4	13,328,500	9
Mathematics & Comp Science	308,600	2	0	0
Physics	0	0	302,500	1
Biotechnology Centre	0	0	14,404,415	3
Centre for Marine Sciences	218,000	2	15,425,000	5
NPI/MIAS	2,117,500	1	3,751,000	1
TOTAL:	**$8,739,472.00**	**13**	**$79,611,415.00**	**34**

*Converted at a rate of J$60.5 to US$1

Reported Internal grants showed a small decline. The Departments of Life Sciences and the Biotechnology Centre/Biochemistry showed marked improvement in garnering grant money and have to be commended.

CONCLUSION

The Faculty has again enjoyed a fairly vigorous year of activity. Growth, however, has not been as marked as we might have wished in areas such as

publications and in earnings from income generating activities. We have seen slight slippage in certain areas also, such as in the number of grants garnered, and, less so, in the dollar amounts accrued from external sources of funding. We would also like to see greater progress in terms of curriculum reform aimed at increasing the efficiency of delivery of the undergraduate programmes. With the increasing threat to our ability to support graduate research programmes, it is heartening to note that the number of research students registered rose slightly in 2003/04. This will no doubt reverse in the coming years and the critical importance of increasing the number and efficiency of the income generating MSc and related programmes, and using the profits from these to support the research thrust, will become increasingly clear.

DEPARTMENT OF CHEMISTRY

Professor Ishenkumba A. Kahwa, BSc (Hons), MSc *(Dar es Salaam),* **DPhil** *(Louisiana State)* – **Head of Department**

Having outlined in the previous year the direction in which the Head of the Department, Professor Ishenkumba Kahwa intended to lead the Department, the 2003-2004 academic started out with a clear sense of direction especially in light of the fact that there were not many changes to the staff complement. And so, the Department continued to carry out its mandate in keeping with its strategic mission and to ensure that the goals and objectives are achieved.

UWI-Mona Policy Conference on Science, Technology and Innovation

The Department played a key role in hosting on behalf of the Faculty of Pure and Applied Sciences and the Principal's Office the UWI Mona Policy Conference on Science Technology and Innovation, which was coordinated by Professor Kahwa and was held in January 2004. The conference was attended by delegates from China, South Africa, government science and technology agencies in the Caribbean, CARICOM, UNESCO, USA and the UN University. It examined the complex issues of science, technology and innovation policy formulation, articulation and implementation in developing countries.

International Exposure for UWI's Chemistry

Following on an invitation from Prof. Kahwa, the prestigious American Chemical Society's weekly magazine, *Chemical and Engineering News,* sent its Associate Editor, Amanda Yarnell, to participate in the January 2004, UWI Mona Policy Conference on Science, Technology and Innovation and to research a story on chemistry and chemical engineering in the Caribbean. Ms Yarnell subsequently visited the St. Augustine and Cave Hill campuses in February and May 2004 respectively and wrote a series of

five articles focusing on chemistry in the Caribbean. The five stories were published under the broad heading "MORE THAN JUST SUN AND SAND" and covered sub-titles: 1) Chemistry at the Caribbean's University of the West Indies is thriving despite funding struggles, 2) Home Field Advantage (a story on UWI's natural products research programmes), 3) Outsourcing –Foreign Pharma Firm's Caribbean Research Outpost are a Boon to UWI; and for the Web version of the magazine, 4) Turf Science (a story on science in the cricket game) and 5) Women in Science (covering staff and student genders at UWI). The articles were published in *Chemical and Engineering News 82(23) 31, (2004*) and with free access (courtesy of the publisher) *on the Web: http://pubs.acs.org/cen/science/8223/8223sci1.html.* The story was very well received by the national, UWI regional and international communities and brought valuable international exposure to the UWI. Our alumni were particularly touched by the positive tone, detailed coverage of key developments in UWI's chemistry programme and the dynamic and bright image that the articles portrayed. The international UWI alumni found them comforting in their efforts to raise funds for the UWI.

Designation of Pesticide Laboratory by UNEP

The Pesticide Research Laboratory, established in the Department by Prof. Tara Dasgupta in the 1990s, achieved international recognition, following its designation by the United Nations Environmental Programme (UNEP) as a Persistent Organic Pollutants (POPs) Analytical Laboratory. The laboratory will be among a network of distinguished facilities around the world which monitor a wide range of POPs. Prof. Tara Dasgupta and his team had undertaken the necessary training and instituted the requisite procedures for the laboratory to qualify for the UNEP designation.

20th Mona Symposium on Natural Products and Medicinal Chemistry

The hosting of the Twentieth Mona Symposium on Natural Products and Medicinal Chemistry from January 5-8, 2004 was attended by over eighty participants, thirty six of whom came from the United States, Canada, the United Kingdom, Japan, Barbados and Trinidad & Tobago. There were ten plenary lectures, thirteen short papers and twenty one poster presentations. The oral contributions focused on the areas of organic synthesis, microbial chemistry and genetics, natural product isolation, biological activity, and NMR spectroscopy.

Closer Cooperation within UWI's Chemistry Departments

During the second semester the Heads of Chemistry Departments of UWI's three campuses met to review the Undergraduate and Postgraduate programmes in Chemistry and explore areas of closer cooperation. A subsequent meeting was held in Antigua and included all three HODs, along with Professor Yvette Jackson and Dr. Willard Pinnock from Mona, Professor Dyer Narinesingh from St. Augustine and Dr. Terry Meeks from Cave Hill campus. The aim of the meeting was to address the proposed curriculum reform which would see all three Departments moving toward having the same or similar core degree programme by 2005. A tri-campus core undergraduate curriculum reform proposal was developed and is being discussed at the three campuses.

Programme Proposal in Occupational and Environmental Safety and Health (OESH)

In an effort to address the shortage of regional capacity for dealing with issues of occupational and environmental safety and health (OESH), especially in view of the impending occupational safety and health legislation, the Department (Prof. Kahwa) has teamed up with the Labour Studies Programme (Mona School of Business)(Prof. Neville Ying) and the Department of Community Health and Psychiatry (Mr. Milton Pinnock) to develop and mount general interest, undergraduate and postgraduate courses in these areas. The project is supported by the Environmental Foundation of Jamaica (EFJ) which provided J$1,392,000 and J$2,000,000 to develop the programmes and set up laboratories respectively. The team members were drawn from relevant UWI Departments as well as environmental, public and private sectors.

Student Enrolment

The Department saw a marked improvement in the intake of undergraduate students with an increase of about 12.5% over the previous year and, as for the previous year, a total of twelve new graduate students were enrolled.

TOTAL STUDENT ENROLMENT IN CHEMISTRY COURSES

LEVEL	2001/2002	2002/2003	2003/2004
Preliminary	296	332	397
Introductory	406	496	533
Advanced	751	725	845

Postgraduate (Research students)			Full-time-45 Part-time-10

STAFF MATTERS

Dr. Winklet Gallimore joined the staff as Lecturer in Organic Chemistry. **Dr. Sujit Dutta** from the University of Burdwan, India took up a two year Research Fellowship to work on Nitrovasodilators with Professor Tara Dasgupta while **Mrs. Jane Arimah**, Research Fellow from the University of Botswana and **Elva Clarke** (Research Assistant) joined the Department to work with Professor Kahwa on the national Hazardous Materials and Waste Inventory and Management Policies Project sponsored by the Environmental Foundation of Jamaica.

One staff member, **Dr. Novelette Sadler-McKnight** was on Sabbatical Leave while **Mr. David Mullings**, Assistant Storekeeper resigned his post.

There were five staff members from the Mona Administrative and Technical Staff who were enrolled in part time undergraduate and postgraduate studies.

On September 25, 2003 the Department mourned the passing of **Mr. Lincoln Edwards,** our Gardener who worked in the Department for over six years and a total of fourteen years with the University.

Achievements, Promotions and Awards

This year, two members of staff, **Dr. Mohammed Bakir** and **Dr. Yvette Jackson** were promoted to professors. **Professor Kahwa** was awarded the 2003 Gleaner Honour Award in the Category of Science and Technology for application of his science to areas such as the environment and health**.** He was also the recipient of the Vice Chancellor's Award for All Round performance in Research and Accomplishments and for his contribution to Public Service.

Dr. Willard Pinnock secured a J$3.74 grant from the Environmental Foundation of Jamaica (EFJ) for a project on Air Quality in Kingston and a UWI Research Fellowship for his work in that field. Dr. Pinnock was also awarded the Vice Chancellor's award for Teaching and he also received the coveted "UWI/Guardian Life Premium Teaching Award" for 2003/2004. Five staff members from the Department were recipients of awards at the Annual UWI Research Day. They include, **Dr. Willem Mulder** for *Best Publication* in the Faculty; **Professor Tara Dasgupta** for

Top Researcher/Research Activity in the Faculty; **Professor Kahwa** for the *Project which attracted the most funding* in the Faculty and **Dr. Greenaway** on winning the Faculty's *Most Successfully Commercialized Research Project.*

Outreach and Public Service

The Department hosted the CAPE Workshop from March 9-12, 2004 and attracted over four hundred sixth form students from several high schools across the island. The students were exposed to *Spectroscopic Methods of Analysis, UV/Visible, Atomic Absorption, Infrared, Mass Spectrometry and Nuclear Magnetic Resonance.* The Workshops were coordinated by Dr. Marvadeen Singh-Wilmot and was ably assisted by Professor Paul Reese, Prof. Robert Lancashire, Dr. Dwight Ramdon, Dr. Danielle Aquart, Dr. Sandra Jarrett, Dr. Norman Townsend and Mr. Paul Clare, a graduate student.

In an effort to expose and stimulate interests in young science students the Department conducted a tour on October 8, 2003 of the Campion College Science Club for them to get first hand knowledge of the operations of our Laser Lab, the Liquid Nitrogen Plant, the Glassblower and the Chemical Crystallography Lab. In addition, arrangements were made for them to visit the Tanaud International Lab where chemical principles and techniques are employed to develop new drugs.

The Yallahs High School in St. Thomas was very pleased to have had Dr. Paul Maragh, Lecturer in the Department participate in their school's Career Week–November 24-27, 2003 entitled 'Career-An Essential of Life'. Dr. Maragh made a presentation on '*Career Opportunities in Chemistry'.*

STUDENT MATTERS

Undergraduate Awards

Congratulations were extended to Miss Ainka Brown for winning the 2003 Gleaner Award in Education. Ms. Brown obtained a First Class Honours degree in Chemistry and she was the Valedictorian at her graduation.

A total of seven undergraduate students from the Department received awards ranging from $10,000 to $60,000 for their academic achievements in Chemistry.

Postgraduates

Two graduate students completed their Doctor of Philosophy degrees, namely **Seon Hepburn** and **Kerry-Ann Bartley-Hynes** while **Madeen Roberts-Miller, Sharonmae Shirley** and **Gillian Guthrie** completed their Master of Philosophy.

RESEARCH GRANTS

Dr. Winklet Gallimore received a grant of US$23,000.00 from the UWI New Initiative Fund for her project on '*Investigation of marine organisms in Jamaican waters for bioactive metabolites'.*

Dr. Anthony Greenaway received a total of J$938,208 from a variety of industries and business establishments in support of the applied chemistry undergraduate summer placement programme.

Professor Yvette Jackson received:

i) £1200.00 from the Royal Society of Chemistry for research in *`Synthesis of Aza-and Diazarotenoids'*

ii) US$37,500.00 from UWI Office of Planning & Institutional Research for Synthesis of Azarotenoids – '*Novel Nitrogen Analogues of Insecticidal, antiviral and Anticancer Agents*'.

Dr. Sandra Jarrett received **US$ 2,420.89** from Research and Publications in support of her project, "*Synthesis of 2 Amino-4-Vinyl thiazoles, A route to Benzothiazoles and other Fused Ring Systems".*

Professor Ishenkumba Kahwa received:

i) **J$2,000,000** from the Environmental Foundation of Jamaica in support of the project '*Start-up Funding for Undergraduate and Postgraduate Programmes in Occupational and Environmental Safety and Health (OESH) at UWI'.*

ii) Research and Publications – **US$3,798** in support of his team's work on 'Lanthanide materials-syntheses, structure and luminescence behaviour'.

Professor Robert Lancashire received **US$20,000** from MDL Information Inc. in support of their project on spectroscopic software

Dr. Willard Pinnock received **J$3,736,090** from the Environmental Foundation of Jamaica in support of his work on Development of sustainable air pollution monitors Programme.

Dr. Novelette Sadler-McKnight earned the Department J$835,366.00 from outreach activities.

OTHER EARNINGS

Other earnings amounted to approximately **J$8,335,000**

RESEARCH IN PROGRESS

Bakir, M.

- Development of poly-pyridyl-like molecular sensors

Coley, M.

- Characteristics of bauxite that affect alumina extraction efficiencies under low temperature digestion conditions (with Dr. A.M. Greenaway)
- Hydrothermal synthesis of Boehmite and $_{\gamma}$-Alumina nano-materials from bauxite waste liquor.

Dasgupta, T. P.

- Inorganic Reaction Mechanisms
- Nitric oxide releasing compounds and their bioefficacies.
- Degradation and fate of pesticides and their metabolites
- Acrylamide in food and mechanism of its formation in living system
- MTBE and other volatile organic compounds in the environment

Ellis, H.A.

- Structural, Microscopic and DSC studies of lead (II), zinc (II) and lithium carboxylates

Gallimore, W.

- Investigation of Marine Organisms in Jamaican Waters for Bioactive Metabolites
- Isolation of pure compounds from marine algal species

Greenaway, A. M.

- Nutrient pollution in Jamaican coastal waters.
- Nitrogen and phosphorus concentrations in ground and surface waters and their fluxes to the coastal zone.
- Alumina extraction efficiencies in the Bayer process (the process to extract alumina from bauxites).

Jackson, Y.

- Synthesis and chemistry of some biologically active heterocyclic compounds and their analogues**.**

Jacobs, H.

- Natural products from selected species of the endemic Jamaican flora.

Jarrett, S.

- The synthesis of 2-Amino-4-vinylthiazoles, a route to benzothiazoles and other Fused Ring systems
- The Synthesis of an Aryl Analogue of Curacin A
- The Synthesis of Conformationally Restricted Analogues of the Hypotensive Agent Caracasanamide**.**

Kahwa, I.

- Syntheses, structure and luminescence spectroscopy of rare earth nanoclusters, their interactions with quantum dots, potential applications in diagnostic and therapeutic biomedicine and catalysis.
- Asbestos usage and pollution in Jamaica/Caribbean: Public, occupational and environmental health impact and policy lessons.
- Science-technology-development policy.

Lancashire, R.J.

– Chemical applications of the Internet.

– The JCAMP-DX spectroscopic data format and distribution of scientific data via the WWW.

Maragh, P.

– Electron transfer reactions with di-nuclear iron (III) cyano-bridged complex with sulfite, ascorbic acid and other reducing agents.

– Synthesis and structure determination of sulfito-chromium (III) macrocyclic complexes.

– Studies on extent of pollution by the gasoline additive, Methyl *Tertiary* Butyl Ether (MTBE) in Ground-water and Soil

– Determination of the levels of Acrylamide (possible carcinogen) in Jamaican Foods.

Minott-Kates D.

– Changes of hypoglycin content in ackee during maturation and with different ackee varieties.

– Comparison of the nutritional and anti-nutritional components of several transgenic papaya lines with a non-transgenic variety.

– Chemistry of the water from different varieties of coconuts grown in Jamaica and determination of the factors affecting the production of pigments in processed coconut water.

Pinnock, W.R.

– Measurements of air pollution in the Kingston atmosphere, conducted at 10 sites around the City using passive monitors developed in the Department of Chemistry.

– Usefulness of red mud in Portland cement concrete building materials.

Porter, R.

– Investigation, characterisation and identification of secondary metabolites from several folklore medicinal plants.

– Extraction and characterisation of constituents of essential oils from local aromatic plants.

Reese, P.

- Medicinal Plants. Plants, mainly from the 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.

Sadler-McKnight, N.

- Heterogeneous Electron Transfer Rates of polypyridyl ruthenium(II) complexes.
- Electron Transfer reactions of dinuclear molybdenum (V) complexes.

Singh-Wilmot, M.

- Novel Lanthanide(III) based dendritic nano-devices: syntheses, characterisation and luminescence spectroscopy and decay dynamics

PAPER PRESENTED

- **Mohammed Bakir,** 'The development of poly-pyridyl-like molecular sensors', Western Carolina University, Cullowhee, NC, April 20, 2003.
- 'The development of poly-pyridyl-like molecular sensors', Tuskegee University, Tuskegee, Al, June 9, 2003.
- 'The development of poly-pyridyl-like molecular sensors', Prairfie View A & M University, Prairie View,TX, June 23, 2003.
- "Chemistry Forum-Reform of the Chemistry Program at Valdosta State University', Valdosta, Georgia, April 24, 2004.
- "Synthesis, spectroscopic and structural properties of metal compounds of polypyridyl-like hydrazones" 228th National ACS-meeting, Philadelphia, PA, USA, August 26, 2004.

Professor R. Lancashire

- "Data Visualisation" ANALYTICAL LABORATORY INFORMATICS, 23-24 June 2004 at the Sheraton Hotel Conference Centre, Bristol University, Heathrow Airport, London, UK.
- "Interactive Web Page Development with CHIME and JAVA" at the Department of Chemistry, Bristol University, UK, in July 2003.

Dr. Paul Maragh

- Synthesis and Characterization of Some Novel Tetranuclear Copper(II) Complexes Derived from Salicylaldimine-based Ligands.
- Synthesis and Characterization of Some Oxo-Vanadium(V) Complexes Involving Salicylaldimine-based Ligands. Attempts at Preparing Insulin Mimicking Compounds. 226th National meeting of the American Chemical Society, New York, NY August 2003.

Dr. Donna Minott-Kates

- 'Transgenic *Carica papaya* L. resistant to *Papaya Ringspot Virus* in Jamaica: Development and safety assessment.' Institute of Food Technologists Conference in Las Vegas, USA, July 2004

Professor P. Reese

- 'Fungal Transformation of some Terpenes and Steroids' 20th Conference on Isoprenoids, at Liberec, Czech Republic, September 12-18, 2003.

PUBLICATIONS

Refereed

* **M. Bakir** and O. Brown, "X-ray crystallographic and optosensing studies of di-2-pyridyl ketone *p*-nitrophenylhydrazone (dpknph) in dimethylsulfoxide (dmso)', *Journal of Molecular Structure* **2002**, 641**,** 183.

* **M. Bakir** and C. Gyles, "Structural, Electrochemical and Optical Properties of di-2-pyridyl ketone furoic acid hydrazone", *Journal of Molecular Structure* **2003**, 649**,** 133.

* **M. Bakir** and C. Gyles, "Optosensing Behavior of the first Ru(II)-compound of di-2-pyridylketone-*p*-nitrophenylhydrazone (dpknph), $[Ru(bipy)_2(dpknph)]Cl_2$, Towards Group 12 Metal Ions" *Spectrochimica Acta,* Part A: Mol. & Biomol. Spectroscopy, **2003**, 59, 2123.

* **M. Bakir** and O. Brown, "The Synthesis, Structure and Physical Properties on the First Rhenium Compound of di-2-pyridylketone benzoylhydrazone (dpkbz) *fac*-$Re(CO)_3(dpkbh)Cl$", *Inorganica Chimica Acta* **2003,** 353, 89.

* **M. Bakir, I. Hassan**, and O. Green "Manganese Carbonyl Compound of N,N-bidentate di-2-pyridylketone (dpk) and N,O,N-tridentate hydroxybis(2-pyridyl)methanolato (dpkO,OH)**"**, *Journal of Molecular Structure* **2003**, 657, 75.

* **M. Bakir,** O. Green, C. Gyles, B. Mangaroo and **R. Porter** "Nuclear Magnetic Resonance and Optosensing Behavior of di-2-thienyl ketone p-nitrophenylhydrazone" *Talanta* **2004**, 62, 781-789.

* **M. Bakir, I. Hassan**, C. Gyles, O. Green, O. Brown and T. Johnson, "X-ray crystallographic, electrochemical and spectroscopic properties of 2-pyridinio 2-pyridyl ketone phenyl hydrazone chloride hydrate" *Journal Molecular Structure* **2004**, 688, 245.

* **M. Bakir**, O. Brown and T. Johnson 'X-ray crystallographic, spectroscopic and molecular sensing properties of *fac*-tricarbonylchloro(di-2-pyridylketonebenzoylhydrazone)rhenium(I) dimethylformamide solvate', *Journal Molecular Structure* **2004**, 691, 256.

* **M. Bakir, I. Hassan,** T. Johnson, O. Brown, **,** O. Green**,** C**.** Gyles and M. **Coley** X-ray crystallographic, electrochemical and spectroscopic properties of 2-pyridinio 2-pyridyl ketone phenyl hydrazone chloride hydrate, *Journal of Molecular Structure* **2004** 688, 213.

* **T. P. Dasgupta** *with D. Aquart* Dynamics of interaction of vitamin C with some potent nitrovasodilators, S-Nitroso-N-Acctyl-D, L-Penicillamine (SNAP) and S-nitrosocaptopril (SNOCAP) in Aqueous Solution. *Biophysical Chemistry* **2004**, 107, 117.

* **T. P. Dasgupta,** *D. Ragoobirsingh and D. McGrowder* The effect of captopril on Blood Glucose, Plasma Insulin and Blood Pressure via a nitric oxide Independent Mechanism in an Animal Model. *Diabetologia Croatica* **2003**, 32**,** 3.

* C. K. Riley**,** A. O. Wheatley, **I. Hassan ,** M. H. Ahmad**,** E. Y. St. A. Morrison, H. N. Asemota Starch, 2004, **56**(2), 69. In vitro Digestibility of Raw Starches Extracted from five Yam (*Dioscorea* spp.) Species Grown in Jamaica

* S.M. Anatao, **I Hassan**, J B Parise. The structure of danalite at high temperature obtained from synchrotron radiation and Rietveld refinements. Canadian Mineralogist, 2003; 41(6)

* **I Hassan,** S M Antao, J B Parise. Sodalite: High-temperature structures obtained from synchrotron radiation and Rietveld refinements. American Mineralogist, 2004; 89 (2-3)

* S.M. Anatao, **I Hassan**, J B Parise. Tugtupite: High-temperature structures obtained from in situ synchrotron diffraction and Rietveld refinements. American Mineralogist, 2004; 89 (4)

* S.M. Anatao, **I Hassan**, J B Parise. Chromate aluminate sodalite, $Ca_8(Al_{12}O_{24})(CrO_4)_2$: phase transitions and high-temperature structural evolution of the cubic phase. Canadian Mineralogist, 2004; 89(4)

* N.O. Townsend and **Y. A. Jackson**, Synthesis of 9-methyl-1H-[1,4]thiazino-[3,2-g]quinoline-2,5,10-(3H)-trione, the B,C,D ring core of the shermilamine alkaloids, *Organic and Biomolecular Chemistry* **2003**, 1, 3557.

* R. U. Richards-Johnson, A. J. Lough and **I. A. Kahwa** *Acta Crystallographica 2003*, E59, m1022. [Aqua(N, N', N", N"'-tetrakis(2-hydroxyethyl)-1,4,7,10-tetrazacyclododecane)neodymium(III)] perchlorate monohydrate

* **I.A. Kahwa**, *Science* **2003**, 302, 1677. Developing World Science Strategies

* M. Bakir, S. A. Clarke, I. Hassan, **R. J. Lancashire** and M. Singh-Wilmot, *trans*-Bis(glycinato-k^{2}N,O)copper(II) 4-bromophenol solvate *Acta Crystallographica* **2004,** E60, m868.

* **W.H. Mulder,** Effect of medium relaxation on the acidity constants of electronically cited states obtained by the Förster cycle method, Journal *of Photochemistry and Photobiology A: Chemistry* **2003,** 161, 21.

* K.J. Donald, **W.H. Mulder** and L. v. Szentpály, Success and failure of polarized-ion models: Bending and atomization energy of groups 2 and 12 dihalides. *Journal of Chemical Physics* **2003,** 119, 5423.

* K.J. Donald, **W.H. Mulder** and L.v. Szentpály, Valence-state atoms in molecules. 7. Influence of polarization and bond-charge on spectroscopic constants of diatomic molecules. *Journal of Physical Chemistry A* **2004**,108, 595.

* **W.M. Mulder,** J. J. Calvente and R. Andreu, The electrocapillary effect at an electrode modified with an insoluble redox-active self-assembled monolayer. *Langmuir* **2004***,* **20**, 869.

* S. M. Antao, **W. H. Mulder**, **I. Hassan**, W.A. Crichton and J.B. Parise Cation disorder in dolomite, CaMg $(CO_3)_2$, and its influence on the aragonite + magnesite = dolomite reaction boundary, *American Mineralogist* **2004**, 89,1142.

* L.A.D. Williams, E. Vasques, W. Reid, **R. Porter** and W. Kraus Biological activity of a leaf surface extrudes extract of *Cleome viscosa* (Capparaceae), *Naturwissenshaften* **2003**, 90 (10) , 468.

* **D. C. Ramdon,** D. A. Dixon, **T. P. Dasgupta** Kinetics and mechanisms of the reduction of chromium(VI) by 2-mercaptoethanesulfonic acid in aqueous solution: difference in the mechanistic process of reduction with noncarboxylate thiols, *Inorganic Reaction Mechanisms* **2003** (5), 47.

* D.O. Collins, W.F. Reynolds and **P.B. Reese** New Cembranes from *Cleome spinosa*., *Journal of Natural Products* **2004**, 67, 179.

* G.D.A. Martin, W.F. Reynolds and **P.B. Reese** Investigation of the importance of the C-2 oxygen function in the transformation of stemodin analogues by *Rhizopus oryzae* ATCC 11145., *Phytochemistry* **2004**, 65**,** 701.

* P.L.D. Ruddock, D.J. Williams and **P.B. Reese** The reactions of palladium(II), thallium(III) and lead(IV) trifluoroacetates with 3 β-acetoxyandrost-5-en-17-one; crystal structure of the first trifluoroacetate bridged 5,6,7-π-allyl steroid palladium dimmer, *Steroids* **2004**, 69, 193.

PUBLIC SERVICE

Professor T. Dasgupta:

- Chief Editor, Jamaican *Journal of Science and Technology*
- Director, Mona Institute of Applied Sciences
- Executive Member, Natural Product Institute
- Member, BSJ Committee for designing Metrology Building
- Member, National Agricultural Health and Food Safety Coordinating Committee
- Member, Board of Editors, Inorganic Reaction Mechanisms.
- External Examiner, University of Guyana.
- Referee for *Inorganic Chemistry, Dalton Transaction*, *International Journal for Chemical Kinetics, West Indian Journal of Engineering*

Dr. W. Gallimore

- Member, Planning Committee, 18th Conference on Science and Technology

Dr. A. Greenaway:

- Member, National Ozone Commission
- Associate, Centre for Marine Sciences

Professor Y. Jackson

- Consultant, Tanaud International
- Regional Editor, MOLECULES

– Foreign Research Mentor for the Minority International Research Training Programme, Barry University, Florida

– Member, Board of Governors, Hampton High School, St. Elizabeth

Professor H. Jacobs:

– Member, Project Steering Committee for Enabling Activities for Jamaica to Develop and implement the National Implementation Plan for the Persistent Organic Pollutants (POPs) Convention

Professor I. A. Kahwa:

– Referee for: *J. Chemical Education, Inorganica Chimica Acta, New J. of Chemistry, Thermochimica Acta, Inorganic Chemistry, Photochemistry and Photobiology, West Indian J. Engineering and J. Coordination Chemistry.*

– Organiser, UWI Mona Policy Conference on Science, Technology and Innovation

– Member, Mathematics Review Committee

– Member, Board of Directors, International Centre for Environmental and Nuclear Sciences

– Member, Quality Review Teams for Chemistry at UWI St. Augustine Campus and Cave Hill Campuses

– Consultant, Asbestos abatement and management for several agencies

Professor R. Lancashire:

– University Representative, Board of the Jamaica Computer Society Education Foundation

– Executive Member, Jamaica Society of Scientists and Technologists

– Leader of IUPAC Task Group on EMR data structures

Dr. P. Maragh:

– Faculty Representatives, FPAS on WIGUT Executive

– Member, National Industrial Safety Committee, Bureau of Standards

– Member, Museums Advisory Board, Institute of Jamaica

– Treasurer, National Council for Indian Culture in Jamaica.

Dr. D. Minott-Kates:

– Member, Jamaica Bureau of Standards Coconut Water Technical Committee

– Member, Agro-Processing Resource Network

– Member, Scientific Research Council Board's Sub-Committee for the Food Technology Institute

– Member, National Agricultural Health and Food Safety Coordinating Committee

– President, WIGUT (Jamaica)

– Director, Better Process Control School

– Member, Advisory Board – Guiding Light

– Member, FRIENDS – Jamaica AIDS Support

Dr. W. Pinnock:

– Member, National Radiation Safety Council, Ministry of Health, Government of Jamaica.

– Member, Steering Committee for Food Irradiation, National Commission of Science and Technology, Office of the Prime Minister

Dr. R. Porter

– Member, Bureau of Standards Propane-Butane technical committee

Dr. D. Ramdon

– Member, Organizing Committee for Caribbean Advanced Proficiency (CAPE) Workshop 2003-2004.

Professor P. Reese

– Member, Equine Drug Testing Committee

– Member, Product Research & Development Committee, Scientific Research Council.

– Vice President, WIGUT (Jamaica)

– Member, Sabbatical Committee

– Member, Car, House and Consumption Loans Committee

– Member, "New Initiatives" Subcommittee, chaired by Prof. F. Hickling

– Reviewer for *"Journal of Natural Products"* and *"Phytochemistry"*

– Organising Secretary, Mona Symposium: Natural Products & Medicinal Chemistry.

Dr. N. Sadler-McKnight,

– Member, Natural Resources Conservation Authority.

– Member, Technical and Finance Committee, 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. M. Singh-Wilmot

– Member, Organizing Committee for Caribbean Advanced Proficiency (CAPE) Workshop 2003-2004.

DEPARTMENT OF GEOGRAPHY AND GEOLOGY

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

WORK OF THE DEPARTMENT

The Department implemented changes to its course offerings in both Geography and Geology which had been approved by AQAC at the end of the 2002/2003 academic year. These changes were designed to rationalize and streamline existing courses, in some cases merging Geography and Geology courses deemed to have some amount of overlap in their syllabi. At the end of the 2003/2004 academic year, more changes to the Geology undergraduate programme had been approved.

The first group of 14 teachers enrolled in the Geography specialism of the new BEd Secondary (Distance) Programme funded by the Ministry of Education registered for the two first-year Geography courses, one in each semester. They were 'taught' by distance mode and sat the final examinations in these courses in December and in April, respectively, and spent two weeks in July 2004 completing the coursework component of these courses on campus.

Two postgraduate students, Sherene James (Geology) and Karen Thomas (Geography), spent the year at the University of Liverpool in the United Kingdom as recipients of Commonwealth Split-Site Awards.

Eighteen students graduated in November 2003 with the MSc degree in Integrated Urban and Rural Environmental Management. In the current year 14 students are registered in this programme, which is coordinated by **Professor Elizabeth Thomas-Hope** in the Environmental Management Unit.

The inaugural mounting of the MSc in Water Resources Management, which was run by **Professor Jasminko Karanjac**, attracted eleven students.

Fourteen students, including five from Appalachia State University (USA), registered for the summer course GL30D: Analysis and Management of Natural Hazards and Risks, which was once again run by **Mr Rafi Ahmad**.

In July the Department welcomed Professor William Gould, University of Liverpool, who came as external examiner for Corin Bailey's Geography PhD thesis. As undergraduate external examiner for Human Geography, Professor Gould also reviewed examination scripts from the Semester 2 examinations, and held very useful discussions with staff.

The Marine Geology Unit, headed by **Professor Emeritus Edward Robinson**, commenced work on two projects funded by the Environmental Foundation of Jamaica. The first, funded to the extent of J$120,000, to examine offshore deposits of sand on the south coast shelf of Jamaica, for potential commercial exploitation, was completed in March 2004 and a report was submitted to the funding agency.

The second, a two-year study of beach erosion and other coastal changes in relation to hazards in selected coastal communities in Jamaica, began in March 2004, under the management of Professor Robinson. Funding for this project was J$5.9 million.

A one-year project to examine the sediment budget of the Rio Grande watershed and its effect on the beach sediments at St Margaret's Bay, Portland, received funding of US$24,000 from NEPA-USAID through Associates in Rural Development as a part of the Ridge to Reef Watershed Project. This project, a follow-up to work carried out last year, commenced in February 2004 and has been assisted by the acquisition of computer equipment from USAID. The co-chief investigators are **Professor Emeritus Edward Robinson** and **Dr David Miller**.

The Sedimentary Basin Resource Assessment (SEBRA) Project, directed by **Dr Simon Mitchell**, and supported by a grant from the Environmental Foundation of Jamaica, entered its third year. Some of the results obtained were presented at the Quarries Seminar in December 2003.

Dr Thomas Stemann, with principal investigator Dr S.K. Donovan (Nationaal Natuurhistorisch Museum, Leiden, The Netherlands) and Dr R. Portell (Florida Museum of Natural History, Gainesville, Florida),

worked on "The Pliocene reefs of Jamaica: implications for biodiversity and faunal turnover," focusing on the Hopegate Formation, Jamaica, under a National Geographic Society grant.

Dr Stemann also worked with principal investigator Dr Daryl Domning (Howard University, USA) on "The dawn of land and sea mammals in the West Indies: Seven Rivers, Jamaica" under another National Geographic Society grant.

Dr Balfour Spence continues to represent UWI on the Caribbean Disaster Management (CADM) Project, an initiative of the Caribbean Disaster Emergency Response Agency (CDERA) and the Japan International Development Agency (JICA). Through this project the Department has secured equipment valued at close to US$80,000 for use in the development of its programme in disaster management. Dr Spence has overall responsibility for community disaster management planning in the project.

Dr Spence received two research grants from the Japan International Cooperation Agency through CDERA. The grants are for conducting research on the relationship among disaster, development and poverty, and on the behaviour of residents of flood-prone areas during flood events. The research is being conducted in collaboration with **Dr Faisal Butt**.

Dr T. Katada of Gumma University, Japan, has been assigned as a JICA short-term education expert to the Department to collaborate with **Dr Spence** in drafting the programme content for a proposed MSc in Disaster Management to be offered by the Department.

The Department was grateful for the donation of two sets of journals, which will be placed in the University Library. A full set of the *Journal of Biogeography*, from the personal collection of the late Dr David Watts, Department of Geography, University of Hull, was donated to the Department by his widow. Professor Colin Clarke, of the School of Geography and the Environment, University of Oxford, donated the following sets of journals: *Geography* (from 1957), *Transactions, Institute of British Geographers* (from 1960), *Area* (from 1965), *Latin American Research Review* (from 1990), and *Bulletin of Latin American Research* (from 1967). Professor Clarke has also undertaken to keep these journals up to date annually.

The Department continued to administer the Earthquake Unit, the Unit for Disaster Studies, and the Environmental Management Unit.

RESEARCH IN PROGRESS

Dr Benedict Arimah

- Infrastructure spending in cities of developing countries.

Professor Wilma Bailey

- The impact of user fees for preventive care services on health-seeking and coping behaviour in Jamaica (IDRC-funded).
- The effect of the HIV/AIDS epidemic on the education sector in Jamaica (UNESCO-funded).

Dr David Barker

- Alternatives to the traditional yam stick method of staking yams.

Dr Faisal Butt

- Modelling groundwater flow in the alluvial aquifer of the lower Yallahs basin, St Thomas, Jamaica.

Professor Trevor Jackson

- Mineralogy of the black sands of the south coast of Jamaica.
- Pumice deposits in St Lucia and Dominica.
- Heavy mineral analysis of the Grand Bay Formation, Carriacou, Grenadines.
- Petrology of the pre-Soufrière volcanic rocks of St Vincent.
- Geochemistry of the Miocene bentonites of Jamaica.
- Petrology of the volcanic rocks of Antigua.

Dr Susan Mains

- Diaspora and transnationalism in relation to Caribbean identities and Jamaican migration in New York, London, Toronto and Kingston.

- Media images of undocumented immigration at the US-Mexico border.
- A documentary film on "Ackees, burgers, and chips: an ABC of Jamaican migration."
- A book manuscript on "Travelling home: diaspora dreams and stories of Jamaican migration."
- The role of monuments, cultural heritage, and public spaces in Jamaica.
- A short documentary film on "Site unseen: Kingston as border city."

Dr Simon Mitchell

- Sedimentology of Recent carbonate beach sediments in Jamaica.
- Lithostratigraphy and sedimentology of the Yellow Limestone Group, Jamaica.
- Lithostratigraphy and palaeogeography of the White Limestone Group, Jamaica.
- Sedimentology and palaeontology of the Red Chalk (with Dr C.J. Underwood, Birkbeck University, UK).
- Geology and stratigraphy of the Central Inlier, Jamaica.
- Sustainable development of sand mining and sediment budgets in Jamaican rivers (SEBRA Project).
- Palaeokarst in Jamaica (with Dr David Miller).
- Origins of sea cows (with Dr D. Domning, Howard University, USA).
- Cretaceous and Eocene echinoderms (with Dr S.K. Donovan, Leiden, The Netherlands).
- Taxonomy and biostratigraphy of rudist bivalves.
- Biostratigraphy and palaeoecology of Jamaican Cretaceous ostracodes.
- Taxonomy and evolution of the coleoidea.
- Palaeontology of sharks (with Dr C.J. Underwood)

- Geoarchaeology of Taino settlements in Jamaica (with Dr P. Allsworth-Jones)
- Geology and geochemistry of dolomite in the Caribbean.
- Strontium isotope stratigraphy of late Cretaceous rudists (with Dr T. Steuber)
- Carophytes of the Maastrichtian-Palaeocene transition, Jamaica and Puerto Rico (with M. Martinez, H. Santos and Dr Garcia).

Professor Emeritus Edward Robinson

- Use of historical air photographs, maps and satellite imagery to determine direction and rates of coastline change in Jamaica.
- Larger foraminiferal zonation for the Tertiary rocks of Jamaica.
- Taxonomy of the lepidocyclinids (larger foraminifera).
- Use of strontium isotope ratio dating for the Eocent-Miocene limestones of Jamaica.

Mr Remy Sietchiping

- Spatial analysis of HIV/AIDS/STI in the Caribbean.
- Modelling informal settlements in developing countries by means of GIS and cellular automata.
- Using remote sensing data to investigate land degradation and sedimentation in Péligre dam, Haiti.

Dr Balfour Spence

- Behaviour of residents of flood-prone areas during flood events (with Dr Faisal Butt, Virginia Clerveaux, and Dr Veront Satchell)
- Relationship among disaster, development and poverty in the Caribbean (with Dr Faisal Butt, Virginia Clerveaux, and Dr Veront Satchell)

Dr Thomas Stemann

- Structure of reef coral diversity in the Late Pliocene Hopegate Formation of Jamaica.
- Coral communities in the Late Cretaceous of Jamaica.

– The ecology of Late Pleistocene *Acropora* in Jamaica.

– Fossil vertebrates of the Jamaican Eocene (with Dr Daryl Domning)

Professor Elizabeth Thomas-Hope

– The role of environmental management in economic performance in the Caribbean in the second half of the twentieth century.

– Biodiversity and land management in small farming systems in Jamaica.

– International migration, including Caribbean skilled migration, transnationalism, remittances, irregular migration, and trafficking in persons. Policy implications of the new trends in international migration in the context of current patterns of globalization.

PAPERS PRESENTED

B. Arimah

- "Vulnerability to environmental health risks in developing countries" (poster). IHDP Open Meeting, Montreal, Canada, October 16-18, 2003.
- "Variations in home ownership in African cities." International Conference on Adequate and Affordable Housing for All: Research, Policy and Practice, Toronto, Canada, June 24-28, 2004.
- "What drives infrastructure spending in cities of developing countries?" City Futures International, Chicago, USA, July 8-10, 2004

W. Bailey

- (with C. Branche, J. Jackson & A. Lee) "Fatherhood in risk environments." Mona Academic Conference: Gender in the 21st Century, UWI, Jamaica, August 29-30, 2003.
- (with S. Lalta, G. Gordon-Strachan, E. Ward & A. Henry-Lee) "Linking researchers and policy makers: some challenges and approaches." Extension of the Social Protection in Health Seminar (PAHO/WHO), Bogota, Colombia, October 6-8, 2003.

- (with A. McCaw-Binns) "The HIV epidemic and the supply of educators and the demand for education in Jamaica." HIV/AIDS: The Power of Education (UNICA/UWI/ UNESCO Conference), Trinidad & Tobago, October 30-31, 2003.
- (with A. McCaw-Binns) "Barriers to accepting HIV/AIDS affected children into basic and primary schools in the KMA." UNESCO HIV/AIDS Seminar, Jamaica, March 19, 2004.
- (with A. McCaw-Binns) ""Barriers to accepting HIV/AIDS affected children into the school community." HIV/AIDS: Research Partnerships for Action, Jamaica, June 10-13, 2004.

D. Barker

- "Indigenous technical knowledge in Caribbean agriculture: yam farmers in central Jamaica." Annual Conference of the Caribbean Studies Association, St Kitts, May 2004.

T. Jackson

- (with R.E.A. Robertson & P. Scott) "High MgO basalts of St Vincent, West Indies." International Union of Geophysics and Geodesy, Sapporo, Japan, June 30-July 11, 2003.
- (with R.E.A. Robertson & P. Scott) "A new geological map of St Vincent, West Indies: beyond walls: multidisciplinary perspectives." School for Continuing Studies Conference, St Vincent & the Grenadines, 2003.
- (with S.K. Donovan, I. Brown & S. Wood) "Small is beautiful? Progress at the Geology Museum, UWI, Mona, since 1988." VII International Cultural Heritage in Geosciences, Mining and Metallurgy: Libraries-Archives-Museums, Leiden, 2003.

S. Mains

- "Life and debt, freedom not yet: consuming and viewing global bodies in Jamaica." Special Session on Integrating Economic and Feminist Geographies, Annual Royal Geographical Society/Institute of British Geographers Conference, London, UK, September 2003.
- "City cultures and Caribbean spaces: site(ing) stories." Text and Testimony Collective Conference, Bridgetown, Barbados, December 2003.

- "(Re)producing citizenship and space: film narratives and documenting dialogues with(in) the Jamaican diaspora." Special session on Jamaican film, Annual English and Film Conference – the Persistence of Form: Culture, History and the Aesthetic, Tallahassee, USA, January 2004.
- "Border crossing: a social geography of travel and Jamaican migration." Department of Geography, University of Toronto, Canada, February 2004.
- "Excavating emigration." Graduate seminar on Critical Issues in Caribbean Studies, Sociology Department, University of the West Indies, Mona, Kingston, March 2004.
- "Translating mobility: documenting diaspora and stories of Jamaican migration." Geography of Film Symposium, The Geography of Cinema: A Cinematic World, Mainz, Germany, June 2004.
- "Representing foreign: negotiating Jamaican migration between New York, London and Kingston." Special Session on Rethinking Migrants, Association of American Geographers Annual Meeting, Philadelphia, USA, March 2004.
- "Memory and migration: documenting the Jamaican diaspora." Annual Conference of the Caribbean Studies Association, St Kitts, May 2004.

S. Mitchell

- (with S. Khan) "Dynamic controls on grain size distribution on a tropical carbonate beach, Jamaica, W.I." Quaternary Coastal Morphology and Sea Level Changes, Puglia, Italy, September 2003.
- (with N. Miller) "The Sebra Project." The Quarries Seminar, UWI, Mona, December 2003.
- "Stratigraphy of the Cretaceous rocks of the Central Inlier, Jamaica." 21st Annual Symposium on Caribbean Geology: Caribbean Palaeontology and Biostratigraphy, University of Puerto Rico, Mayagüez, February 25-29, 2004.

- "Morphology, microstructure and stratigraphy of some small, late Cretaceous radolitid rudists from Jamaica." 21st Annual Symposium on Caribbean Geology: Caribbean Palaeontology and Biostratigraphy, University of Puerto Rico, Mayagüez, February 25-29, 2004.

R. Sietchiping

- (with R. Wyatt & H. Hossain) "Urban informal settlements within less developed countries: a simulation." Planning Institute of Australia, Tasmania, Australia, February 22-26, 2004.
- "How informal settlements grow: a modelling approach." Association of American Geographers Annual Meeting, Philadelphia, USA, March 14-19, 2004.
- "Where do we go from here: predicting informal settlements dynamics." Institute of Australian Geographers Conference, Adelaide, Australia, April 13-16, 2004.
- (with S. Mains & M. Clifford) "Socio-spatial perspectives on HIV/AIDS in the Caribbean." World Conference on Health Promotion and Education, Melbourne, Australia, April 26-30, 2004.
- (with R. Louis & J.P.M. Basquiet) "Utilisation de la télédetection dans l'étude de dynamique de la degradation des sols et de la sédimentation du lac Péligre, Haiti" (English title: "Using remote sensing to study land degradation and sedimentation in Péligre dam, Haiti"). Proceedings of the Journées Internationales de Télédetection, Ottawa, Canada, May 24-29, 2004.
- "Paradigm shift: improving future slum policies in developing countries using prediction." International Housing Conference, Toronto, Canada, June 24-27, 2004.
- "Using simulation and modelling techniques to inform housing policies in developing countries." European Network for Housing Research, Cambridge, UK, July 2-6, 2004.
- "Planning the unplanned: modelling informal settlements by means of GIS and cellular automata." International Planning History, Barcelona, Spain, July 14-17, 2004.

B. Spence

- (withE. Jones) "Potential impact of climate change and severe weather events on urban water resources in Jamaica." CDERA/IDB Seminar on Climate Change and Severe Weather Events in Asia and the Caribbean, Barbados, July 24-25, 2003.
- (with F. Butt & V. Clerveaux) "Flood hazard mapping and community disaster management planning." Inter-Regional Seminar on Flood Hazard Mapping and Its Use in Community Disaster Management Planning in the Caribbean and Central America, Barbados, February 16-17, 2004.

T. Stemann

- "Reef coral diversity in the Late Maastrichtian of Jamaica." Evolution and Phylogeny Session, 9th International Symposium on Fossil Cnidaria and Porifera, Graz, Austria, August 3-7, 2003.
- (with S.K. Donovan & R.W. Portell) "Late Pleistocene reef coral associations from the Hopegate Formation of northern Jamaica: were there coral communities in the Caribbean during the Eocene?" Geological Society of America, Northeastern Section/ Southeastern Section Joint Meeting, Tysons Corner, USA, March 25-27, 2004.

(with S.K. Donovan, R.W. Portell) "Macropalaeontology of the Hopegate Formation, Jamaica, an Upper Pliocene raised reef." Geology Society of America, Northeastern Section/Southeastern Section Joint Meeting, Tysons Corner, USA, March 25-27, 2004.

E. Thomas-Hope

- "Caribbean migration and development." Conference on Caribbean Issues, organized by the US State Department for US diplomatic staff and State Department advisers, Washington, DC, October 18-20, 2003.
- "New areas of research in Caribbean migration and their policy implications." 86th Session of the Council of the International Organization for Migration, Geneva, Switzerland, November 19-20, 2003.
- "Globalization and the future of Caribbean agriculture: alternative strategies and environmental implications." Royal Institute of International Affairs, London, November 25, 2003.

- "Caribbean migration and diaspore: from labour migration to transnationalism." UNESCO workshop on Con- ceptualizing Caribbean Migration and Diaspora, UWI, Mona, March 6, 2004.
- "Environmental education in Jamaican schools." Institute of Education, UWI, Mona, March 22, 2004.
- "Sustainable rural development policy." Chair, Planning Institute of Jamaica conference, Kingston, April 21, 2004.
- "Water management and sanitation in Jamaica." Session chair, NEST workshop on Water, Health and the Environment, Kingston, April 28, 2004.
- "Strategies and policies for watershed management." Annual retreat of the National Watershed Management Commission, Runaway Bay, Jamaica, May 7-8, 2004.
- "Human trafficking in the Caribbean." International meeting of the International Organization for Migration on Improving Data on Human Trafficking, Rome, May 27-28, 2004.
- "Belonging and the sense of home among Caribbean migrants." Session chair, Caribbean Studies Association, Basseterre, St Kitts, June 3-4, 2004.
- "Social and economic implications of migrant remittances for the Caribbean." Regional seminar on Migrants' Money Remittances: An Alternative for Latin America and the Caribbean, organized by the Permanent Secretariat of the Latin American Economic System and the Andean Development Corporation, Caracas, Venezuela, July 26-27, 2004.

PUBLICATIONS

Refereed

* **B. Arimah.** "Measuring and explaining the provision of infrastructure in African cities." *International Planning Studies*, 8, 3, 2003, 225-240.

* **B. Arimah.** "Nature, determinants and prospects for sustainable human development in the Arab region." In B. Laabas (ed.), *Arab Development Challenges of the New Millennium*, Ashgate, Aldershot, 2003, 429-457.

* **W. Bailey**, C. Branche & A. Henry-Lee. "Gender relations and conflict management in inner city communities in Jamaica: the importance of community participation." In J. Pugh & R. Potter (eds.), *Participatory Planning in the Caribbean: Lessons from Practice*, Ashgate, UK, 2003.

* A. Henry-Lee, **W. Bailey** & C. Branche. "Conflict, gender relations and the health of women." In S. Arber & E. Vilquin (eds.), *Social and Economic Patterning of Health among Women*, Paris, CICRED, 2003.

* R.B. Potter, **D. Barker**, D. Conway & T. Klak. *The Contemporary Caribbean*, Harlow Essex: Pearson-Prentice Hall, 2004 (520 pp.).

* S.K. Donovan, R. Pickerill, R. Portell, **T. Jackson** & D.A.T. Harper. "The Miocene palaeobathymetry and palaeoenvironments of Carriacou, the Grenadines, Lesser Antilles." *Lethaia*, 36, 3, 255-272.

* S.K. Donovan & **T. Jackson.** "*Quo vadis* the *Transactions*? Publishing strategy and the future of the Caribbean Geological Conferences." *Caribbean Journal of Science*, 40, 1, 2004, 1-7.

* **S. Mains.** "Teaching transnationalism in the Caribbean: toward an understanding of representation and neo-colonialism in human geography." *Journal of Geography in Higher Education*, 28, 2, 2004, 315-330.

* **S. Mains.** "Imagining the border and southern spaces: cinematic explorations of race and gender." *GeoJournal*, 59, 4, 2004, 253-264.

* **S. Mains**, A. Oberhauser, D. Rubinoff, K. DeBres & C. Pope. "Geographic perspectives on women: geography and gender." In G. Gaile & C. Wilmott (eds.), *Geography in America at the Dawn of the 21st Century*, Oxford University Press, Oxford, 2004, 738-760.

* **S. Mitchell.** "Morphology, microstructure and stratigraphy of some late Cretaceous radiolitid rudists from Jamaica." *Geologica Croatica*, 56, 2003, 149-171,

* **S. Mitchell, D. Miller** & R. Maharaj. "Field guide to the geology and geomorphology of the Tertiary limestones around

the Central Inlier, Jamaica." *Caribbean Journal of Earth Science*, 37, 2003, 39-48.

* **S. Mitchell.** "Sedimentary and tectonic evolution of central Jamaica." In C. Bartolini, R.T. Buffler & J.F. Blickwede (eds.), *The Circum-Gulf of Mexico and the Caribbean: Hydrocarbon Habitats, Basin Formation, and Plate Tectonics*, American Association of Petroleum Geologists Memoir 79, 2004, 605-623.

* **S. Mitchell, T. Stemann**, D. Blissett, I. Brown, W. O'Brian Ebanks, G. Gunter, **D. Miller**, A. Pearson, B. Wilson & W. Young. "Late Maastrichtian rudist and coral assemblages from the Central Inlier, Jamaica – towards an event stratigraphy for shallow-water Caribbean limestones." *Cretaceous Research*, 25, 2004, 499-507.

* K. Drobne, V. Cosovic & **E. Robinson. "**Velike miliolide zgornje krede in paleogena skozi prostor in cas." *Geologija*, 45, 2, 2002, 359-366.

* **E. Robinson.** "Changes along the coast of Vere, Jamaica, over the past two hundred years: data from maps and photographs." *Quaternary International*, 120, 2004, 153-161.

* K.J. Cunningham, J.L. Carlson, G.L. Wingard, **E. Robinson** & M.A. Wacker. "Characterization of aquifer heterogeneity using cyclostratigraphy and geophysical methods in the upper part of the karstic Biscayne aquifer, southeast Florida." US Geological Survey Water Resources Investigative Report WRIR 03-4208, 2004 (46 pp.).

* **T. Stemann.** "Coral reef diversity in the Late Maastrichtian of Jamaica." *Berichte des Institutes für Geologie und Paläontologie der Karl-Franzens-Universität Graz/Austria*, 7, 2003, 105.

* **E. Thomas-Hope** & **B. Spence.** "Jamaica." In H. Brookfield, H. Parsons & M. Brookfield (eds.), *Agrodiversity: Learning from Farmers across the World*, United Nations University Press, Tokyo and New York, 2003, 270-292.

* **E. Thomas-Hope.** "Poverty and irregular migration in the Caribbean." In G.J. Borjas & J. Crisp (eds.), *Poverty, Migration and Asylum*, Palgrave MacMillan, London, 2004, Chapter 14.

Non-Refereed

* **S. Mains.** "Developing film: media and geography roundtable." *Place and Culture: Cultural Geography Specialty Group Newsletter*, Spring 2004.

* **S. Mains.** "Teaching geography and gender discussion forum." *Geographic Perspectives on Women Specialty Group of the AAG Newsletter*, March 2004.

* **S. Mains.** "Translating film." *Baile 2004*, University College Dublin, Ireland, 2004.

* **E. Thomas-Hope.** "Shifting location and negotiating place: migration and gender in Caribbean migration." *Research Report to the Centre for Gender Studies*, UWI, Mona, 2003, 33 pp.

PUBLIC SERVICE

W. Bailey

- UWI representative, Board of the Jamaica Environmental Foundation.
- Chief Examiner, CAPE Geography.
- Convenor of the Geography Panel, CAPE.

D. Barker

- Editor, *Caribbean Geography*.
- Chairman, *Aqueduct Newsletter* subcommittee, SCR Club.
- Member, Management Committee, SCR Club.
- Chairman, Steering Committee, Jamaica Geographical Society.

T. Jackson

- Member of editorial board, *Jamaica Journal of Science and Technology*.
- Member, IUGS Commission on Geoscience Education and Training.
- Member, Caribbean Community Ocean Sciences Network.
- Member, Standing Committee, Caribbean Geological Conferences.
- Honorary member, Geological Society of Jamaica.

– Member, Geological Society of Trinidad and Tobago.

– Member, American Geophysical Union.

– Member, Association of Geoscientists for International Development.

S. Mains

– Board member, Geographic Perspectives on Women Specialty Group of the AAG.

– Editor, *Geographic Perspectives on Women Specialty Group of the AAG Newsletter*.

– Board member, Cultural Geography Specialty Group of the AAG.

– Reviewer, *GeoJournal*.

– Participant and documentarian, The Jamaican Diaspora-Reciprocal Relations-Way Forward Symposium, Kingston, Jamaica.

– Expert witness (invited by Brent Law Community Centre, UK), Asylum Hearing, Home Office, London, UK, 2003.

– Member, Fundraising Committee, Women in Film and Television, Jamaica, 2003.

S. Mitchell

– Chairman, Commission on Jamaican Lithostratigraphy.

– Member, Technical Working Group on Jamaican Beach Policy.

– Council member, Geological Society of Jamaica.

– Editor, *Caribbean Journal of Earth Science*.

– Editor, *Contributions to Geology* (UWI).

E. Robinson

– Member, Caribbean Academy of Sciences.

– Honorary Member and Member of Council, Geological Society of Jamaica.

– Member, American Association of Petroleum Geologists.

– Fellow, Third World Academy of Sciences, and member of the Selection Committee for the TWAS Prize in Earth Sciences.

– Member, Board of Directors of the Nature Preservation Foundation of Jamaica.

– Member, Editorial Board of the *Journal of the Institute of Marine Affairs*, Trinidad and Tobago.

R. Sietchiping

– Member, GIS Day Committee, UWI, Mona., November 2003.

– Member, Land Information Council of Jamaica.

– Member, essay and poster competition judging committee, Scientific Research Council.

T. Stemman

– President, Geological Society of Jamaica.

– Member, Field Trip Subcommittee, and Earth Science Week Subcommittee, Geological Society of Jamaica.

E. Thomas-Hope

– Chairman, Board of the Jamaica Social Development Network (now an NGO).

– Member, Tribunal for the NRCA Act of the Ministry of Land and Environment.

– Director, Jamaica Board of Engineers Foundation.

– Director, Luis Fred Kennedy Environmental Foundation.

– Member, Royal Institute for International Relations (London) Caribbean study group, preparing a volume on critical issues pertaining to the impact of current globalization on the Caribbean.

– Member, International Scientific Advisory Team of the People, Land Management and Environmental Change Programme of the United Nations University, Tokyo.

– Member, editorial advisory boards of *The Caribbean Journal of Agriculture and Natural Resources*, *The International Journal of Disability Issues*, and *Progress is Development Studies*.

– Journal referee for *Social and Economic Studies*, *Progress in Development Studies*, *Population Geography*, and *The World Health Organization Bulletin*.

CATEGORIES OF STUDENTS

Undergraduates: Geography

Course		Regd	Sat	Passed	%Passed
GG10A	Introduction to Human Geography	129	127	120	94
GG10B	Introduction to Physical Geography	137	132	80	61
GG20R	Geographical Thought & Research Methods	38	38	35	92
GG21A	Urban Geography	49	48	44	92
GG21B	Geography & Development	55	52	48	92
GG22A	Geosphere & Hydrosphere	60	59	49	83
GG22B	Atmosphere & Biosphere	48	48	40	83
GG31C	Tropical Agricultural Systems & Development	16	16	15	94
GG31F	Health & Society	14	13	12	92
GG31G	Geographies of Tourism	15	15	13	87
GG32A	Geomorphic Processes & Landforms	13	13	12	92
GG32E	Climate Change: Concepts, Causes & Issues	27	27	25	93
GG33B	Urban & Regional Planning	29	29	29	100
GG33F	Introduction to GIS & Remote Sensing	28	28	27	96
GG33H	Environmental Resource Management	28	28	28	100
GG33K	Disaster Management	32	32	32	100
GG360	Research Paper	36	31	27	87

Undergraduates: Geology

GL10A	Introduction to Earth Sciences I	63	60	55	92
GL10B	Introduction to Earth Sciences II	67	64	56	88
GL21A	Palaeontology	20	19	18	95
GL22A	Sedimentology	17	17	15	88
GL23B	Igneous Petrology	17	16	15	94
GL24B	Metamorphic Petrology & Petrological Methods	13	13	12	92
GL25A	Structural Geology & Geological Mapping	20	19	18	95
GL30D	Analysis & Management of Natural Hazards & Risks	14	14	14	100
GL311	Field Geology	16	16	16	100
GL32A	Caribbean Geology	16	16	15	94

GL33A	Engineering Geology & Hydrogeology	19	17	16	94
GL34A	Advanced Sedimentology & Fossil Fuels	12	12	11	92
GL35A	Advanced Palaeontology	8	8	8	100
GL39J	Marine Geology	13	12	12	100

Undergraduate Prizes Awarded

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

The Geological Society of Jamaica Scholarship was awarded to **Lorraine Richards**.

The Harry Kuarsingh Memorial Bursary was awarded to **Kirwin Ganga**.

Postgraduates: Environmental Management

Fourteen students were registered for the MSc degree in Natural Resource Management – Integrated Urban and Rural Environmental Management.

Eleven students were registered for the MSc degree in Water Resources Management.

DEPARTMENT OF LIFE SCIENCES

Dale F. Webber, BSc, PhD *UWI* **- Head of Department**

WORK OF THE DEPARTMENT

Teaching

The Department continued to enjoy the benefits of the restructuring of its final year program, over the last three years, to produce four clear Majors and two Options. The number of students registered in the Department increased significantly, with level I courses BB10A & B increasing by 20%, BL10L & M increasing by 34% and Preliminary Biology increasing by 16%. Registrations in advanced level Zoology major Level II courses were lower (18%) while Botany Major Level II courses increased by 16%. The increase in registrations for the new Environmental Biology and Experimental Biology shows strong support for the restructuring exercise.

The BEd Distance programme started in 2003, continued over the summer of 2003, with BL10L being offered in addition to the BL10M offered to last year's trial cohort. As was the case last year two senior graduate students **Metz Peterkin** and **Gale Persad** delivered the courses with **Dr. Ralph Robinson** acting as coordinator of the programme.

The Department successfully mounted a new MSc. in Plant Production and Protection (PPP) with 9 students who are all registered part time and should be graduating at the end of the 2004/05 academic year. **Dr. Phyllis Coates-Beckford** is the coordinator of the MSc. (PPP) programme. This is the second taught masters programme offered by the Department, as the MSc TEAM which started with 3 students in 2002/03 continued with a new cohort of 8 students in the 2003/04 academic year. This MSc. which

is coordinated by **Dr. Peter Vogel** was also delivered part time to allow registered candidates to maintain job related activities.

The visit of one of the Department's two External Examiners, **Professor Roger Marchant**, was an extremely beneficial exercise as he was able to comment on the courses, examinations, student performance and examiner performance all within one week of the completion of the examination process. This gave examiners the opportunity to discuss grades, issues and course objectives while Faculty and University examinations consultations were in progress, thus benefiting the students and the system immediately rather than some three to six months later when some of these benefits would no longer be available.

The annual Departmental Retreat examined several initiatives in teaching and research. The employment of multimedia technologies in teaching and graduate student training, the use of the internet in teaching and research, and the consolidation of the Department of Life Sciences as an integrated research entity all received strong support from staff. The establishment of an academically enhanced operating environment and the need for greater student involvement in practical-based projects in the Department were also approved. The desire for follow-up information on student placement, post-graduation, was recognized as a potential asset to the Department as it prepares its offerings to reflect national and regional needs.

The 16% budget cut faced by the Mona Campus loomed large throughout the retreat discussions and decisions were taken for implementation over the next academic year involving reduced staffing and income generation projects.

Outreach

The Department continued to be active in its outreach programmes with a strong link established with the community colleges which teach the Preliminary Biology Course at five locations around the island. The Department is not satisfied with the poor pass rates from some of these Community Colleges (one in particular where all students failed) and thus the outreach effort will be doubled in the 2004/05 academic year with a specific coordinator appointed.

Dr. Mona Webber & **Mr. Frederick Boyd** moderated the Joint Board for Teacher Education Double Option Biology exams. This opens the door for greater collaboration between the Teachers Colleges and the

Department of Life Sciences as we all endeavour to have teachers of science trained and enthused.

The marine life live exhibit (aquarium) in the Department of Life Sciences booth on Research Day 28 and 29th Jan, was extremely popular and proved a great crowd-pleaser. Special thanks are thus due to **Mr. Marlon Hibbert**, PRML. A quickly constructed Departmental DVD by **Dr. Mark Thomas** was also very popular as was the Life Sciences contribution of live butterflies to the Bookshop booth by **Dr. Audette Bailey**.

World Wetlands Day saw the Department providing expertise in three of the four national projects island wide, **Dr. Eric Hyslop** gave an introductory talk on the importance of wetlands to an invited audience at the opening of the Institute of Jamaica exhibition, **Mr. Marlon Hibbert** assisted in the mounting of a wetlands display in Port Antonio at the Ridge to Reef exhibition and **Dr. Dale Webber** gave the keynote address at the World Wetlands Day celebration in Negril at the Royal Palm Reserve.

Other notable outreach activities associated with the Port Royal Marine Laboratory were:

Jamaica Coral Reef Monitoring Network (JCRMN), Caricomp Training, Earth Day Activities (April) - **Mark Gold, Terrence Hall, Marlon Hibbert**; The National Ramsar Committee Membership- **Mona Webber, Marlon Hibbert**, Palisadoes and Port Royal Protected Area Committee, Planning Meeting Sustainable Operations of the Port Royal Diver's Chamber -**Marlon Hibbert** and Lime Cay Public Meeting – **Terrence Hall**.

Plant and vehicles

The Departmental Land Rover, which was used for high mountain expeditions, continued to be a major expenditure in terms of maintenance and was sold in May with the hope of purchasing a new mountain terrain vehicle with these and other funds to be identified. Through the offices of the Deputy Bursar the Department was able to replace its vehicle lost by theft which returns the departmental fleet to four (4) twin cabin light trucks, a Land Rover and a 29 seater bus. The second Land Rover (which was a gift from Cambridge University in 1996) and the oldest twin cabin light truck, are not road worthy and sale of these items are being pursued.

Through the efforts of the Principal and the Deputy Bursar, the Department was able to secure 30 insect proof herbarium cabinets to

bring the Herbarium to international standards as one of only two such repositories in the island. Further assistance resulted in the procurement of 25 Olympus microscopes essential to the teaching of advanced Biology courses which allowed the increase in numbers of some courses.

Port Royal

The Port Royal Marine Laboratory (PRML) under the direction of **Dr. Mona Webber** continued to be a pivotal part of the delivery of the Life Sciences academic programme with 8 undergraduate courses and 3 higher degree courses being taught from the facility and another 8 courses being supplied by field collections from the laboratory. Approval to commence general refurbishing of the buildings at PRML was gained from the UWI Bursary the first phase of which will involve the main teaching lab or "wet lab" and security issues. Refurbishing exercises completed over the year were in the areas of sanitary facilities by the Maintenance Department. Acquisitions at the PRML in the 2003/04 academic year include a 25 Ft Eduardono Scuba Boat - "Navicula" (retrofitted- Port Royal Staff) a 21 Ft used boat trailer (refurbished by Port Royal Staff), a Toyota Pickup 4x4 (1) and email connectivity (e-mail address: prml@uwimona.edu.jm). First Aid Kits (4), fire Hose and Reel (2), fire Extinguishers (4) fixed and (4) boat were also acquired through the University's consultants: Safety and Emergency Management Systems.

Staff Matters

The Department experienced a very active year which started with the appointment of **Dr. Dale Webber** as Head of Department effective August 1st 2003 for three years. Over the 2003/04 academic year **Dr. Mona Webber** and **Dr. Eric Garraway** proceeded on sabbatical leave and **Ms. Gale Persad** and **Dr. Marcia Mundle** joined the Department for a year as Sabbatical replacements. **Mr. Frederick Boyd** was appointed as a Lecturer on three year contract effective August 1st 2003 and effective the same date **Dr. Dwight Robinson** and **Dr. Paula Tennant** both had their contracts extended for a further three years. Also **Dr. Tennant** and **Dr. Byron Wilson** received their contracts with indefinite tenure. **Dr. Dwight Robinson** was promoted to cross the Merit Bar and **Dr. Kurt McLaren** was promoted to Lecturer from Assistant Lecturer.

With these gains the Department also lost **Dr. Sasikala Potluri** who resigned July 31st 2003. The Department wishes her the very best as she joins her husband **Dr. Devi Prasad** who resigned during the previous

year. The retirement of **Dr. Dunbar Steele**, the first Head of the merged Department of Life Sciences, and former Head of the Department of Zoology and the retirement of **Professor Brian Freeman** from the academic staff as well as the resignation of **Mrs. Alicia Lyn Sue Chin** and **Ms. Shernette Farquharson** from technical positions resulted in a significant loss in departmental expertise, however the rebuilding process continues. Following these departures there will be renewals as the Department advertised and should soon be welcoming two new Lecturers in Horticultural Science and Coral Reef Biology, two areas of great expectation in the coming years. **Dr. Karl Aiken** received his Ph.D. at graduation Ceremony November 7th 2003 along with one other Ph.D., **Dr. Audette Bailey** who was appointed Research Fellow effective March 2004.

Secretary **Ms Karlene Anderson** continued on no pay leave and was temporarily replaced by **Mrs Debbie-Ann Smith-Brown**. Ms Anderson returned to duties in January 2004. Scientific Officer, **Mr. Michael Buchanan** was also granted one year no pay leave from December 2003 and his duties have been admirably performed by **Mr. Wendel Christie**.

RESEARCH IN PROGRESS

Professor Emeritus Ivan Goodbody has found it necessary to relinquish all laboratory and field work. Nevertheless he has continued a fruitful collaboration with American scientists in documenting aspects of biodiversity on the Belize Barrier Reef. The most recent results of this collaboration will be published in a forthcoming issue of Atoll Research Bulletin published by the Smithsonian Institution in Washington D.C. Professor Goodbody has also continued collaboration with the Mona Institute of Applied Sciences in preparing a CD-ROM depicting images of Caribbean Ascidiacea for use by students and researchers needing to identify animals in this Class.

Mrs. Charlotte Goodbody has continued to curate collections of marine animals from the deep sea in the Department collections. In collaboration with a German scientist she has published the description of a new species of deep sea sponge collected from Jamaican waters.

Dr. Karl Aiken

- Research on fisheries interactions between fish trap and dolphin mammals in the Whitehouse area with a view to

formulating fisheries management measures (with Nichelle Oxford).

- Research on tilapia aquaculture (with Ben Sinclair).

Dr. Jane Cohen

- Effects of solarization and mulching on weed ecology and their effectiveness as weed management strategies in organic farming.
- Tree-crop interactions in contour hedgerow agroforestry systems
- Herbicidal effectiveness of household disinfectants (with Mr D. Hutton)

Dr. Kisan Vaidya

- Plant Breeding work is in progress in order to produce high yielding and photoinsensitive cultivar(s) of roselle (sorrel).
- Genetics of morphological mutations in roselle.
- Genetic studies in moth bean (Vigna aconitifolia), mung bean(Vigna radiata), and blue pea (Clitoria ternatea).
- Multiplication (initial increase of genetically pure seed) of Dolichos lablab and Cyamopsis tetragonoloba for future work.

Dr. Mona Webber

- Water quality monitoring in mangrove lagoons using plankton and traditional indices.
- Sponges of the Port Royal mangroves.
- Bivalves of the Port Royal Mangroves
- Change in mangrove root communities over time.
- Zooplankton secondary production in Discovery Bay.
- Zooplankton abundance and species at selected south coast banks.

Dr. Paula Tennant

- Development of papaya (Carica papaya L.) germplasm resistant to Papaya ringspot virus by genetic engineering and conventional breeding methods.
- Development of transgenic West Indian Sea Island cotton with resistance to insect pests.
- Evaluation of the diversity in Citrus tristeza virus and citrus viroids.

Dr. Dale Webber

- Environmental management and planning
- Artemia (brine shrimp) production
- Oceanography and modeling of coastal ecosystems
- Contructed wetlands for waste water improvement
- Water quality assessment in coastal environments

Dr. Mark Thomas

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

Dr. Ralph Robinson

- Human public health importance of rat lung worm infections that may result in meningitis in Jamaica.

Dr. Eric Hyslop

- Ecology and management of riverine systems
- Use of Benthic Macro Invertebrates as indicators in riverine systems

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

Dr. Byron Wilson

– 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.

Research Grants and Awards

Dr. Karl Aiken

J$1.25M from the Environmental Foundation of Jamaica

Dr. Mona Webber

2003 (November) – EFJ (Environmental Foundation of Jamaica) research grant for J$ 4,563,750. for the project: "The Mangrove Ecosystem- A Biodiversity Hot-Spot."

Dr. Byron S. Wilson

2003 Miami Metrozoo; for predator control study ($3750U.S.)

2003 Research & Publications Centre Fund, Mona Campus ($43,500JA)

2003 UWI New Initiative grant; for research on Jamaica's endangered forests and fauna ($16,000U.S.)

2004 Audubon Zoo (New Orleans); for predator control study ($1500U.S.)

2004 UWI New Initiative grant; for employing a field technician ($240,000JA)

2004 Conservation International; for research on the Jamaican Iguana ($5000U.S.)

2004 Houston Zoo Naturally Wild Conservation Fund; for research on Jamaican Iguana ($2500U.S.)

2004 International Iguana Foundation ($6500U.S., with P. Vogel)

Dr. Dwight Robinson

2003 JADF (Ja$3,387,500) Pest control of West Indian Sea Island Cotton

2003 UWI (Ja$750,000)

2003 CIDA Green fund (Ja$2,175,500) Pest control & management for Organic production of cabbages in Jamaica.

PAPERS PRESENTED

- **CA Waugh,** Lindo JF, Bishop K, Eberhard M & Robinson RD. (2004). *Angiostrongylus cantonensis* – an emerging infection in Jamaica. Proceedings of the International Conference on Emerging Infectious Diseases, Centers for Disease Control & Prevention, Atlanta, USA (February 28 – March 4, 2004).
- **CA Waugh,** Lindo JF, Bishop K, J. Eberhard M & Robinson RD. (2004). Report of an emerging zoonosis, *Angiostrongylus cantonensis*, in Jamaica. Proceedings of the Northern Caribbean University Science Symposium 2004 Jamaica (April 20, 2004).
- C.A. Waugh, J.F. Lindo, S. Fletcher, C. Cunningham- Myrie, M.L. Eberhard, J. Lorenzo Morales, R.D. Robinson. Report on current infections with *Angiostrongylus cantonensis* (Nematoda: Metastrongylidae) in rats and molluscs in Jamaica. European Multi-colloquium of Parasitology, Valencia, Spain
- S. Fletcher, C.A. Waugh, J.F. Lindo, J. Lorenzo-Morales, R.D. Robinson. Studies of the intestinal helminths of dogs from the Kingston Metropolitan Area, Jamaica, with special emphasis on *Ancylostoma* sp. European Multi-colloquium of Parasitology, Valencia, Spain
- L.P. Daley, D. Lewis, B.S. Wilson, P. Vogel, and **R.D. Robinson** (2004). Comparison of the enteric helminth fauna of two populations of Small Indian Mongoose in Jamaica. The Nature of the Islands Conference, Trinidad & Tobago, 15-18 August 2004.
- **RD Robinson,** Cecelia Waugh, John Lindo, Karen Bishop and Mark Eberhard (2004). *Angiostrongylus cantonensis* (Nematoda: Metastrongyloidae) infection: an emerging zoonosis. The Nature of the Islands Conference, Trinidad & Tobago.
- RD Robinson (2004). The GM debate must not neglect developing countries**.** II International Workshop of the Latin Amercican and Caribbean Bioethics Network. Havana, Cuba (September 2-3, 2004).

- Wilson, B. S. 2004. Conservation of reptile diversity in a Jamaican forest: experimental removal of the introduced Indian mongoose. The Nature of the Islands: Trinidad and Tobago, 15-18 August 2004.
- Daley, L.P., B. S. Wilson, P. Vogel, and R. Robinson. 2004. Intestinal helminthes of the Indian mongoose. The Nature of the Islands Conference, St. Augustine, Trinidad and Tobago, 15-18 August 2004.
- Small, H. Lue, K. Webber, D.F and Webber, M.K. 2003. Water quality and plankton of the Conch Fishery area at Pedro Bank, south of Jamaica. Association of Marine Laboratories of the Caribbean, Annual Conference, Trinidad, July 2003.
- Elliott, T. and Webber, M.K. **2003.** Temporal changes in mangrove root communities from contrasting habitats in the Port Royal mangroves, Kingston Harbour, Jamaica. Association of Marine Laboratories of the Caribbean, Annual Conference, Trinidad, July 2003.
- Hibbert, M. 2003. Seminar "Kingston Harbour in the Year 2025"
- Abdulkadri, A., Pinnock, S., and Tennant, Paula. (2004) Public perception of Genetic engineering and the choice to purchase Genetically modified food. Annual Meeting of the American Agricultural Economics Association, Denver, Colorado, August 1-4, 2004
- Tennant, Paula., Chin, M., Pinnock, S., Powell, M., Wheatley, A. O., Roberts, M., Minott, D., Jackson-Malete, J., and Gonsalves, D. (2004) Transgenic Carica papaya L. resistant to Papaya ringspot virus in Jamaica: Development and safety assessment. Institute of Food Technologists? Annual General meeting, Las Vegas, Nevada, July 12-16, 2004

PUBLICATIONS

Books

* Fermin, G., Tennant, P., Gonsalves, C., Lee, D., and Gonsalves, D. (2004) Comparative Development and impact of transgenic papayas in Hawaii, Jamaica and Venezuela. In Transgenic plants: Methods and Protocols, Vol. 286, Methods in Molecular

Biology, L. Pena, editor. Humuna Press, Totowa, New Jersey. pp 397-428.

* Wilson, B. S. 2003. Of mongooses and lizards, p. 113-119. *In* R. W. Henderson and R. Powell (eds.), Islands and the Sea: Essays on Herpetological Exploration in the West Indies. Society for the Study of Amphibians and Reptiles, Ithaca (New York). Contributions to Herpetology, volume 20.

* Wilson, B. S., R. Hudson, A. Alberts, R. Kerr, N. Thompson, R. Nelson, D. Lewis, and P. Vogel. 2004. Survival and reproduction of repatriated, zoo-reared Jamaican Iguanas: headstarting as a viable conservation strategy. Pages 220-231 *in* A.C. Alberts, R.L. Carter, W.K. Hayes, and E.P. Martins (eds.), Biology and Conservation of Iguanas. University of California Press, Berkeley.

Refereed papers

* Goodbody, C. and H. Lehnert 2004. *Aulospongus phakelloides* sp. n. (Demospongiae: Poecilosclerida: Raspailiidae) from deep water off Jamaica, W. I. Bull mar. Sci. 74 (1) 163-169.

* Goodbody, I. 2003. Kingston Harbour, Jamaica. An Overview. Bull. mar. Sci. 73 (2) 249-255.

* Goodbody, I. 2004. Natural History in Jamaica. Reflecting on the past and charting the future. *Jamaica Journal* 27 (2-3) 48-53.

* Hyslop, E. 2003. Addition to the freshwater malacofauna of Jamaica. Revista *de Biologia Tropical* 51 (1) : 262-263.

* Webber, D.F., Webber, M.K**.** and Williams, D. D. 2003**.** The relative importance of meteorological events and tidal activity in determining the circulation patterns and flushing time of Kingston Harbour. *Bull Mar Sci.* 73: 273-290.

* Dunbar, F. N. and Webber, M.K. 2003.Zooplankton distribution in a tropical embayment, Kingston Harbour, Jamaica. *Bull Mar Sci.* Volume 73: 343-360.

* Webber, M.K**.**, Ranston, E.R., Webber, D.F., Dunbar, F.N. and Simmonds, R.A. 2003. Changes in water quality and plankton in Kingston Harbour after 20 years of continued eutrophication. *Bull Mar Sci.* 73: 361-378.

* Persad, G.; Webber, M.K.; Hopcroft, R. and Roff, J.C. 2003.Annual density, biomass and production of gelatinous zooplankton at Lime Cay and Kingston Harbour. *Bull Mar Sci.* 73: 379-396.

* Webber, D.F.; Webber, M.K. and McDonald, K. 2003.Mangrove forest structure under varying environmental conditions. *Bull Mar Sci.* 73: 491 506.

* Bigg, G.R. & D.F. Webber. 2003. The impact of coastline change and urban development on the flushing time of a coastal embayment, Kingston Harbour, Jamaica. *Bulletin of Marine Science* Vol. 73 (2): 291-306.

* Green, S. O. and D.F. Webber. 2003. The effects of varying levels of eutrophication on phytoplankton and seagrass (*Thalassia testudinum*) populations of the Southeast coast of Jamaica. *Bulletin of Marine Science* Vol. 73 (2):443-456.

* Ranston, E.R. and D.F. Webber. 2003. Phytoplankton distribution in a highly eutrophic estuarine bay, Hunts Bay, Kingston Harbour Jamaica. *Bulletin of Marine Science* Vol.73 (2):307-324.

* Ranston, R.A. Simmonds, and D.F. Webber. 2003. The phytoplankton distribution in Kingston Harbour, Jamaica. *Bulletin of Marine Science* Vol.73 (2):325-342.

* Thompson, H. and D.F. Webber. 2003 The sand dune ecology of the Palisadoes, Kingston Harbour, Jamaica. *Bulletin of Marine Science* Vol.73 (2):507-520.

* Webber, D.F., and P.Wilson-Kelly. 2003. Characterization of sources of organic pollution to Kingston Harbour, the extent of their influence and some rehabilitation recommendations. *Bulletin of Marine Science* Vol.73 (2):257-272.

* Harvey, G. H., Ivan Goodbody and Karl A. Aiken 2003. The Artisanal thread herring fishery of Kingston Harbour: a review. *Bulletin of Marine Science* Vol.73 (2):398-420.

* Buddo, D., R.D. Steele, E. Ranston D'oyen. 2003. Distribution of the invasive Indo-Pacific green mussel Perna viridis in Kingston Harbour Jamaica. *Bulletin of Marine cience* Vol.73 (2):420-433.

* Goodbody, I. 2003. The Ascidian fauna of Port Royal, Jamaica I. Harbour and mangrove dwelling species. *Bulletin of Marine Science* Vol.73 (2):457-476.

Non-refereed papers

* Aiken, K. A. & G.A. Kong. 2004. Recent development in Jamaica's conch fishery. Proc. Gulf & Carib. Fish. Instit. 48:541-550

PUBLIC SERVICE

Dr. Jane Cohen

- Member of Alien Invasive Species Working Group
- Advisor, Banana Board Research Department

Dr. Kisan Vaidya

- Member, Gene Bank Committee, Jamaica.
- Member, Technical Committee, Jamaica Agricultural Development Foundation (JADF)

Dr. Mona Webber

- Scientific Editor, Special volume of Bulletin of Marine Science on Kingston Harbour.
- Member, Steering Committee for Sea Turtle Recovery Network, Hope Zoo.
- Member, American Society of Limnology and Oceanography (ASLO).
- Member, Association of Marine Laboratories of the Caribbean.
- Member, Caribbean Academy of Sciences, Jamaican Chapter.

Dr KA Aiken

- Member, Board of Directors Caribbean Maritime Institute
- Member, Select Committee on Economy & Production, Gordon House, Kingston

- Member (and Co-founder), Board of Directors, Jamaica Conservation & Development Trust
- Member, Board of Directors, Caribbean Coastal Area Management (CCAM) Foundation (since 1997)
- Member, Scientific Authority, Convention and International Trade in Endangered Species of Flora & Fauna (CITES), Jamaica

Dr Dale Webber

- Chairman, National RAMSAR committee
- Chairman, CL Environmental Ltd
- Immediate Past-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 Ralph Robinson

- Member, Board of Directors, Jamaica Agricultural Development Foundation.

Dr Peter Vogel

- Board Member, Scientific Authority
- Chairman, Jamaican Iguana Research and Conservation Group
- Member, Alien Invasive Species Working Group
- Member, IUCN West Indian Iguana Specialist Group
- Member, Executive Committee and Past President, Bird Life Jamaica

– Member, Scientific Advisory Committee, Blue and John Crow Mountains National Park

– Member, Advisory Board, Natural History Division, Institute of Jamaica

– Member, Society of Caribbean Ornithology

Professor Ivan Goodbody

– Member, Editorial Boards of Bulletin of Marine Science and of Caribbean Marine Studies.

STUDENTS AND COURSES

Performance in courses:

Course Code & Name	No. Reg	No. Sit	No. Pass	% Pass
BB10A Cells, Biomolecules and Genetics	285	284	193	68
BB10B Introductory Microbiology	280	272	178	64
BL05A Preliminary Biology I	162	155	75	46
BL05B Preliminary Biology II	163	149	99	61
BL10L Animal Diversity	173	173	121	70
BL10M Plant Diversity	158	153	130	82
BL20J General and Molecular Genetics	54	53	48	89
BL20K Evolutionary Biology	50	49	46	92
BL20L Diving Technology for Aquatic Scientists	10	10	10	100
BL20N Ecology	64	63	60	93
BL20P Biometry	60	59	46	77
BL30K Soil Biology	11	11	11	100
BL30M Mycology	12	12	11	92
BL31A Coastal Management	17	17	17	100
BL33D Freshwater Ecology	21	21	20	95
BL31E Marine Ecology I: Biological Oceanography	17	17	12	71
BL31F Marine Ecology II: Benthic Communities	14	14	14	100
BL38A Virology	20	20	18	90
BL39C Research Project	8	8	8	100

BL39D Caribbean Biodiversity	19	19	17	89
BL39E Conservation Biology	20	19	18	90
BT21B Seed Plants	51	51	43	84
BT22A Plant Physiology	50	49	48	96
BT31A Phycology	15	14	14	93
BT33A Ecology, Agroforestory and Sustainable Development	8	8	8	100
BT34A Principles of Plant Breeding	9	9	8	89
BT37Q Plant Health	10	19	18	95
BT38B Plant Biotechnology	8	8	6	75
Z20G Functional Organisation of Animal I: Maintenance System	51	49	44	86
Z20H Functional Organisation of Animals II: Coordination, Protection and Movement	48	48	43	90
Z30A Sensory and Neuromuscular Physiology	28	27	26	93
Z30B Metabolic Physiology	28	27	26	93
Z30G General Parasitology	27	27	27	100
Z30M Immunology	37	37	29	78
Z31C Fish Biology	10	19	19	100
Z31F Fisheries & Aquaculture Technology	11	11	11	100
Z32C Insect Biology & Systematics	11	11	11	100
Z32F Pest Management	16	16	16	100

Prizes Awarded

The following students were formally recognized for quality academic performance.

Preliminary Biology	**IIiya Yejide Hamilton**
Introductory Biology	**Lucine M. Edwards** **Sean C. Swaby**
Level II Zoology	**Marc E. Phillpotts**
L.B. Coke Plant Physiology Prize	**Kimberly-Ann Byfield**
Vincent McKie Zoology Prize	**Autrene N. Buchanan**

Graduate Programme Enrolment

MPhil programme	44 full time, 27 part time
PhD programme	4 full time, 9 part time

MSc Plant Production & Protection	9 part time
MSc Tropical Ecosystem Assessment & Management	8 part time

Award of Higher Degrees

Master of Philosophy

Nadia Ferguson	Supervised by Drs. Mona & Dale Webber
Christine Kirkwood	Supervised by Dr. Mark Thomas
Damian Nesbeth	Supervised by Dr. Eric Hyslop
Philip Rose	Supervised by Dr. Dale Webber
Kaydene Williams	Supervised by Dr. Phyllis Coates-Beckford
Peter Wilson-Kelly	Supervised by Dr. Dale Webber
Cesna McCain	Supervised by Dr. Mona Webber
Primrose Campbell	Supervised by Dr. Mona Webber
Celia Jackson	Supervised by Dr. Mona Webber

Doctor of Philosophy

Karl Aiken	Supervised by Prof. Brian Freeman
Audette Baile	Supervised by Dr. Eric Garraway

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

Professor Ronald E. Young, BSc, MSc *UWI,* **PhD** *St. And*
– Acting Head of Department

WORK OF THE DEPARTMENT

The Department had a year of highs and lows. Among the notable successes was the elevation to Professorships of **Drs. Wen Bin Zhang** and **Alexandra Rodkina.** Mrs Lila Rao and Mrs Gunjan Mansingh were admitted to pursue the one-off, PhD programme in Information Science being offered by the MSB and have started attending. Dr. Ezra Mugisa was awarded a Research Fellowship to carry forward his MORRESA project (**MORRESA** = **MO**na **R**epository of **RE**usable **S**oftware **A**ssets), with his teaching duties assumed by Mr. Eyton Ferguson. Professor Mervyn Curtis resigned as Head of Department and left at the end of the year, upon termination of his contract. Concerns over the breakdown of civil relationships in the Mathematics Section prompted a Faculty Review and major overhaul of Faculty in the Section. The Dean, Professor Young was appointed to act as Head in the interim with the assistance of the Deputy Dean, Dr. (now Professor) Ralph Robinson.

Mr. Ashley Taylor, having completed the work for his PhD thesis, has returned to the Department, whilst awaiting the defence. He continues, however, to retain an affiliation with Georgia Tech University where he is involved with a major project related to his thesis work. A new batch of 5 students was admitted to the MSc in Biostatistics and, when it emerged that the planned total assumption of the programme at Mona, could not be effected, funds were identified through the University of South

Carolina to bring in lecturers to deliver some of the courses and to allow the students to complete the remaining courses and initiate their research projects at South Carolina. The students have now returned to the Mona Campus and are completing their projects. The programme has now been extensively revised, with increasing emphasis on the biomedical and epidemiological aspects, and it has been proposed that coordination be shifted to the TMRI who had provided the original impetus for the programme. The input from Mathematics will remain important. The MSc in Computer Science offered by the Computer Science Section in collaboration with the MIAS registered 30 students and has been progressing satisfactorily with the involvement of specially recruited lecturers as required.

The Computer Science Section instituted the **Karl Robinson Award** for the first time in 2004 in memory of the late the Dr. Karl Robinson who was the Head of the Computer Science Section at the time of his death. This award will be given annually to the final year student with the best academic performance. The award for 2003/2004 went to Cecil Reid.

The weekly seminar programme in both sections of the department continued to exhibit vigorous activity involving both lecturers and graduate students. Dr. Jonathan Farley Visiting Associate Professor at MIT and the recipient of the Harvard Foundation 2004 Distinguished Scientist Award, visited the Department in March and gave two talks on *Linear Extensions of a Ranked Poset, Enumerated by Descents: A Problem of Richard P. Stanley from 1981* and on *Breaking Al-Qaeda Cells: A Mathematical Analysis of Counter-terrorism Operations (A Guide for Risk Assessment and Decision Making)*. Dr Farley was also the keynote speaker at the Faculty Awards Ceremony on March 25, where he spoke on *The Prayer of Queen Dido: Preparing for West Indian Leadership and Global Dominance in Science, Industry, and Academia*. He also took the opportunity to conduct a class with one of the undergraduate groups in mathematics.

The vacant chair in Computer Science was advertised but no suitable applicants were identified. Arising out of this, it was agreed that the Department should host a workshop including the Computer Science and related faculty from the other campuses in order to define a unified University vision of what should be the major objectives of Computer Science regionally and locally, how our programmes in Computer Science should be orientated and how we should be organising to meet the objectives identified. A suitable time for holding this workshop has not yet been agreed on between the campuses.

Two of Dr. Ezra Mugisa's graduate students, Errol Dennis and Richard Pyne (PhD candidates) attended a conference in Austria in February 2004. They presented papers at the IASTED International Conference on Applied Informatics. Dr. Daniel Coore attended a conference in Boston in May 2004 and presented a paper on the topic: *'Towards a Universal Programming Language for Amorphous Computing'*. This is to appear in the Proceedings of the NECSI International Conference on Complex Systems 2004 (ICCS2004) (Special issue of InterJournal), New England Complex Systems Institute, Boston, MA.

Dr. Daniel Coore organised a track on Amorphous Computing for a Conference on 'Conventional Programming Paradigms' scheduled for September 2004 in France.

ABSTRACTS/CONFERENCE PRESENTATIONS

Dennis, Errol Hugh and **Ezra K. Mugisa**. Identification of Static Structures of Reusable Software Architectures. Proceedings of the IEEE SoutheastCon 2004, Greensboro, North Carolina, March 2004, IEEE 2004.

Pyne, Richard A. and **Ezra K. Mugisa.** Essential Elements of a Component-Based Development Environment for the Software Supermarket. Proceedings of the IEEE SoutheastCon 2004, Greensboro, North Carolina, March 2004, IEEE 2004.

Coore, Daniel. Towards A Universal Programming Language for Amorphous Computing. Presented at NECSI International Conference on Complex Systems 2004 (ICCS2004). Boston, MA. May 2004.

PUBLICATIONS

Refereed

* Dennis E.H. and **E.K. Mugisa**. Reusable Software Architecture for an Accounting Information System, in M.H Hamza (editor) – Proceedings of the IASTED International Conference on Software Engineering, Innsbruck, Austria, February 2004, pp. 275-280. ACTA Press 2004.

* Pyne R.A. and **E.K. Mugisa**. The Software Supermarket: A Catalyst for Component-based Software Development, in M.H. Hamza (editor) – Proceedings of the IASTED International Conference on Software Engineering, Innsbruck, Austria, February 2004, pp. 269-274. ACTA Press 2004.

* **Rodkina A.** & Nosov V. On Stability of Some Non-linear Scalar Differential Equations. *Dynamic Systems and Applications*. Vol. 12. 2003. Pp. 285-294

* **Rodkina A.**, Nosov V. and Gomez J.M. On Application of Kharitonov's Theorem to Analysis the Stability of Journal Bearings. *Functional Differential Equations*. Vol. 10. No 3–4. 2003. pp. 555-561.

* **Rodkina A.** and Schurz H. A Theorem on Asymptotic Stability of Solutions of Non-linear Stochastic Difference Equations with Volterra Type Noise. SACTA, Vol. 6, No 1, 2004, Pp. 23-24.

* **Rodkina A.** and Schurz H. Global asymptotic stability of solutions to cubic stochastic difference equations. *Advances in Difference Equations***.** Vol. 3. 2004). Pp. 249-260.

* **Rodkina A.** & Mao X. On Asymptotic Behaviour of Solutions to Non-linear Difference Equation with Nonmartingale Type Noise. Chapter 4 in a book *"Advance in Mathematics Research",* Vol. 6, Nova Science Publishers, 2004. Pp. 101-126.

* **Zhang, Wen-Bin.** High Order Mean-Value Theorems for Multiplicative Functions via Halasz's Method. Annales Univ. Sci. Budapest, Hungary, Sect. Comp. 22 (2003), 395-402.

* **Zhang, Wen-Bin.** Corrigendum: Mean-value Theorems of Multiplicative Functions on additive arithmetic semi groups, Mathematics Z., DOI: 10.1007/Soo 209-004-0675-7, (2004).

DEPARTMENT OF PHYSICS

Donald Walwyn, BSc, PhD *UWI* **– Head of Department**

WORK OF THE DEPARTMENT

Teaching

With the exception of one undergraduate course, the general pass rate was good or satisfactory. Student assessment ranged from very good to satisfactory

Research

The Department's research activities continued to be led by the work of the Climate Modeling Group. The Group continued projects involving (i) The Threat of Dengue Fever – Assessment of Impacts and Adaptation to Climate Change in the Caribbean, (ii) Diagnostics and Prediction of Climate Variability and Human Health Impacts in the Tropical Americas, (iii) Developing the Caribbean El Nino News Network – CENNN and (iv) The structure and properties of synoptic systems that affect the Caribbean.

Research directed at developing solutions for GPS tracking, based on features of the GSM cellular network, operating in Jamaica, became more focused – concentrating on innovative approaches to error correction.

Research continued exploring ways to make the photovoltaic process more efficient in the Jamaican context. Research was initiated seeking ways to reduce the complexity of Coded Orthogonal Frequency Division Multiplexed Radio Transmissions.

Research in Progress

Dr. A.M.D. Amarakoon

– Climate variability/change impacts on agriculture, and renewable energy.

Mr. Lawrence Brown, Miss Cassandra Rhoden and Professor A. Chen

– Downscale global model results for use in the region.

Prof. A. Chen, Miss Cassandra Rhoden, Miss Jody-Ann Minott, Mr. Rainaldo Crossbourne, and Dr. Michael Taylor

– Investigate the link between Climate and Health (dengue fever in particular) and Climate and Agriculture (sugar cane yield).

Mr. Ronaldo Crossbourne, and Dr. Michael Taylor

– To develop a Caribbean Climate database.

Dr. L. Myers and Miss Darlene Fields

– Investigating the suitability of available photovoltaic technology to the Jamaican environment

Dr. Lucien Ngalamou and Mr. L. Buchanan

– The development of software tools for the design of Programmable Logic Controllers

– The design of a Petri Nets-to-Fuzzy Sets conversion for Discrete-Event Systems.

Dr. Andrew Russell

– Texas Instruments and their DLP technology

Dr. Andrew Russell, Prof. Alan Oppenheim and Mr. Sourav Dey

– "Digital pre-compensation for faulty D/A converters" project (an extension of PhD research)

Dr. Andrew Russell and Mr. Richard Hemmings

– Non-linear pre-distortion algorithm for an ultrasonic audio transducer using Simulink.

Dr. Joseph Skobla, Mr. Ryan Turner, Mr. Leonardo Clarke, and Mr.Glen McFarlane

– The Global Positioning (GPS) Micro-tracking System

– UWI GPS Tracking System

Miss Taniecia Stephenson, Dr. Michael Taylor, and Prof. Anthony Chen

– Investigate the synoptic processes which determine the climatology of the Caribbean rainy season, and how these are altered by the El Nino Southern oscillation phenomenon

Miss Taniecia Stephenson, Dr. Michael Taylor, Miss Jacqueline Spence and Prof. Anthony Chen

– Investigate the dynamics of the primary Caribbean dry season and how it is conditioned by sea surface temperatures in the tropical and Pacific oceans.

Dr. Michael Taylor, Miss Soyini Aida Ashby and Miss Tannecia Stephenson

– Create prediction models for seasonal rainfall in the Caribbean and Jamaica using global climate indices as predictors.

Dr. Donald Walwyn, Miss Yahnique Barrett and Miss K. Munroe

– Investigating the application of orthogonal frequency division multiplexing (OFDM) to broadband wireless access problems in the Jamaican environment.

PAPERS PRESENTED

- **Chen, A.A. W. Bailey and C. Heslop-Thomas** "Human dimensions of climate change in the Caribbean – taking stock and moving forward." Open Meeting of the Global Environment Change Research Community, Montreal, Canada, October 16-18, 2003.
- **Owino, A., A, A. Chen, and C. Rhoden**, "Climate Change Scenarios for the Caribbean." Communities and the Impact of Climate Change Conference. Winnipeg, Canada, March 2004.
- **Owino, A. and C. Rhoden,** "Use of Modeling and Scenario Tools." Regional Workshop on Integrating Natural Hazard Impact Assessment into Environmetal Impact Assessment (EIA). Barbados, February 11-12, 2004
- **Skobla J., R Turner, L Clarke,** and **C. Scarlett,** "Contribution to Error Correction GPS Tracking System", IMEKO 2nd

International Symposium on Measurement, Analysis and Modeling of Human Functions, Genova, Italy, June 2004

- **Spence, J., M.A. Taylor, and A.A. Chen**, "The effect of concurrent sea surface temperature anomalies in the tropical and Atlantic on Caribbean rainfall". 1st International CLIVAR Conference, June 2004, Baltimore, USA.
- **Stennett, R., and C. Rhoden** "Use of Modelling and Scenario Tools." Regional Training Workshop on Integrating Natural Hazard Impact Assessment into Environmental Impact Assessment (EIA). Barbados, February 11-12, 2004.
- **Stephenson, T., and A.A. Chen**, "Modes and Circulation Features of the Dry and Early Wet Rainfall Seasons for the Caribbean" Poster. 1st International CLIVAR Conference, June 2004, Baltimore, Maryland, USA.

PUBLICATIONS

Refereed

* **Amarakoon, A.M.D., Anthony Chen, Samuel Rawlins and Michael Taylor** Climate Variability and Patterns of Dengue in the Caribbean. AIACC Notes, 2(2), p. 8, November 2004; http://www.AIACCPROJECT.org

* **Amarakoon, A.M.D. . A.A. Chen, S.C. Rawlins and M.A. Taylor** Dengue epidemics – its association with precipitation and temperature, and its seasonality in some Caribbean countries (16 pages) 49th Annual CHRC Council and Scientific Meeting, Grenada, April 21-24, 2004; WIMJ Supplement, 53 (2) p.60, 2004; ISBN: 0043-3144 WIMJAD

* **Amarakoon, Dharmaratne, Roxanne Stennett and Anthony Chen** Climate Variability and Disease Patterns in Two South Eastern Caribbean Countries (15 pages). CEF-2, Trinidad, May 31-June 4, 2004

* **Rawlins, S.C, A. Chen, M. Ivey, D. Amarakoon and Karen Polson** The impact of climate change/variability events on the occurrence of dengue fever in parts of the Caribbean: a Retrospective study for the period 1980-2002 (15 pages). 49th Annual CGRC Council and Scientific Meeting, Grenada, April

21-24, 2004; WIMJ Supplement, 53 (2), p. 54, 2004; ISBN: 0043-3144 WIMJAD

Non-Refereed

* **Dey, Sourav, Andrew I. Russell and Alan V. Oppenheim** Digital pre-compensation for faulty D/A converters.

* **Myers, Leary, Fields, Darlene and Hall, Conroy** "Development of Photovoltaics in Jamaica" CEIS Update Vol. 18, No.2, June 2004

* **Russell, Andrew I., and Paul Beckmann** Sampling Rate Conversion US Patent Number 6,665,694

* **Russell, Andrew, Alan Oppenheim and Sourav Dey** "Digital pre-compensation for faulty D/A converters" presented at ICASSP conference in Montreal May 2004.

* **Skobla, J**., "GPS and Electronics" Science, Technology and Innovation UWI Leading Nation," UWI Proceedings, 2004

* **Skobla, J., and Mr. L. Clarke,** "A Microcontroller Cellular Based Communication Network for a GPS Error Correction System", IEEE Proceedings, AEROSPACE, March 6-13, 2004.

* **Skobla, J., and Mr. R. Turner**, "A Mapping Solution for GPS/GIS in Kingston, Jamaica", IEEE Proceedings, AEROSPACE, March 6-13, 2004

* **Skobla J., and Mr. G. McFarlane** "GPS Based Marine Communicator", IEEE Proceedings, AEROSPACE, March 6-13, 2004

PUBLIC SERVICE

Dr. A.M.D Amarakoon,

– Examiner, Year 1 and 2 Physics, Joint Board of Teacher Education

Prof. A.A. Chen

– Fellow, Royal Meteorological Society

- Country Representative for Jamaica, Inter-American Institute for Global Change Research
- Member, National IGBP Committee
- Member, International Solar Energy Society, American Association of Physics Teachers, American Meteorological Society, Jamaica Society of Scientists and Technologists.

Dr. L. Myers

- Member, Board of Directors and Deputy Chairman of the Scientific Research Council
- Chairman, Product Research and Development Sub-Committee
- Member, Board of Directors, Spectrum Management Authority
- Chair, Human Resources Sub-Committee
- Member, National Energy Strategy and Forecasting Committee
- Judge, IEEE student competition at the IEEE conference Ocho Rios 2003

Dr. Andrew Russell

- Member, Moorlands Camps Committee
- Member, Board of Trustees, Jamaica Youth for Christ
- Consultant, Digital Signal and Image Processing for Texas Instruments Inc., Plano, Texas
- External Examiner, for two courses taught at C.A.S.E

Dr. J. Skobla

- Consultant, Bureau of Standards, Jamaica – GPS Time Dissemination

Dr. M.A. Taylor

- Member, American Geophysical Union
- Board member and Proposal Co-Author: Environmental Stewardship Committee of the Jamaica Baptist Union.
- Alternate Country Representative, Jamaica, Inter-American Institute for Global Change Research

Research Grants

US$5,000 to support graduate research in climate variability from the Inter-American Institute for Global Climate Change Research. The grant was facilitated through the CRN73 project on 'Climate Variability and Its Impact in the Mexican, Central American and Caribbean Regions.'

CATEGORIES OF STUDENTS

Undergraduate:

Course		No. sat exam	No. passed	Pass rate %
P04A	Preliminary Physics A 89	76		85
P04B	Preliminary Physics B 89	74		84
P14A	Introductory Physics A	150	96	64
P14B	Introductory Physics B	127	108	85
P23E	Modern Physics 1	10	8	80
P23F	Optics & Oscillations 9	7		78
P23H	Electricity & Magnetism & Solid State Electronics	14	12	86
P24F	Signals and Systems	36	50	72
P24G	Electric Circuit Analysis	27	21	78
P24H	Communications Systems	53	48	91
P24J	Analog Electronics	23	19	83
P24K	Digital Electronics	46	32	70
P24L	Solid State Electronic Devices	35	29	83
P25F	Materials Science 1	14	13	93
P33G	Physics of Climate	17	14	83
P33H	Fluid Dynamics and Renewable Energy	14	12	86
P33J	Electromagnetism and Solid State Physics	15	11	73
P34F	Digital Signal Processing	39	38	97
P34G	EM Transmission and Propagation	25	25	100
P34H	Digital Communications	40	38	95
P34J	Microcontroller Applications	30	30	100
P34K	Microprocessors	22	19	86
P34L	Instrumentation	14	12	86
P34P	Electronics Project	9	9	100

First Class Degrees with Majors in Electronics and/or Physics were awarded to **Ms Jodi-Ann Lai** and **Melissa Sturridge** as well as Messrs **Chad Andrade**, **Dwight Linton, Jahmai O'Sullivan, Cecil Reid** and **Adrian Walwyn**.

Two Postgraduate students completed their MPhil degrees. They are:

– Mr. Trevor Hall whose title was "**Relationships between Jamaican September, October and November Rainfall**

and Hurricane Predicting Parameters" and his supervisor was Professor Anthony Chen.

– Miss Jacqueline Spence whose "**Examining the effect of concurrent sea surface temperature anomalies on Caribbean rainfall."** Her supervisor was Dr. Michael Taylor.

Four (4) students were awarded the MSc in Digital Technology degree

Prizes Awarded:

The Departmental Prizes for academic performance in Level 2 courses were awarded to **Messrs. Chad Andrade** and **Cecil Reid.**

The Departmental Prize for academic performance in Level 1 courses was awarded to **Mr. Dale Ross**.

The Francis Bowen Bursary for Physics was awarded to **Ms. Jodi-Ann Lai**.

The Michael Tharmanahthan Memorial Bursary was awarded to **Ms. Melissa Sturridge.**

The First Place Poster Award went to **Ms. Tannecia Stephenson** for poster presented at CLIVAR Conference, Baltimore, 2004.

Best Publication, FPAS went to **Dr. M.A. Taylor** and **Professor A.A. Chen** at UWI Research Day Awards January 2004 for paper "Influence of the Tropical Atlantic versus the Tropical Pacific on Caribbean Rainfall."

Research Fellowship was awarded to **Dr. M.A. Taylor,** August 2003.