FACULTY OF PURE AND APPLIED SCIENCES
MONA

Year ending July 31, 2004

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

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

**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**

<table>
<thead>
<tr>
<th>Department</th>
<th>No of Courses</th>
<th>Total Credits</th>
<th>Enrolment</th>
<th>Mean No./Course</th>
<th>Load/Staff Member</th>
</tr>
</thead>
</table>
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.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Level of Degree</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>First</td>
<td>32</td>
<td>10.9</td>
<td>27</td>
</tr>
<tr>
<td>Upper Second</td>
<td>92</td>
<td>31.4</td>
<td>87</td>
</tr>
<tr>
<td>Lower Second</td>
<td>88</td>
<td>30.1</td>
<td>90</td>
</tr>
<tr>
<td>Pass</td>
<td>32</td>
<td>10.9</td>
<td>37</td>
</tr>
<tr>
<td>Fail</td>
<td>49</td>
<td>16.7</td>
<td>46</td>
</tr>
<tr>
<td>Total Sitting</td>
<td>293</td>
<td>100.0</td>
<td>287</td>
</tr>
<tr>
<td>Total Registered</td>
<td>1224</td>
<td></td>
<td>1280</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Graduate</th>
<th>REGISTERED</th>
<th>GRADUATING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001/02</td>
<td>2002/03</td>
</tr>
<tr>
<td>MSc</td>
<td>86+56*</td>
<td>82+73</td>
</tr>
<tr>
<td>MPhil</td>
<td>178</td>
<td>181</td>
</tr>
<tr>
<td>PhD</td>
<td>42</td>
<td>61</td>
</tr>
<tr>
<td>Total:</td>
<td>306</td>
<td>324</td>
</tr>
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</table>

*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.

<table>
<thead>
<tr>
<th>Graduate</th>
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<tbody>
<tr>
<td>Department</td>
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<tr>
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</tr>
</tbody>
</table>

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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 No. External No.
                              (J$eq.)* Grants (J$eq.)* 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

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<thead>
<tr>
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<tbody>
<tr>
<td>Preliminary</td>
<td>296</td>
<td>332</td>
<td>397</td>
</tr>
<tr>
<td>Introductory</td>
<td>406</td>
<td>496</td>
<td>533</td>
</tr>
<tr>
<td>Advanced</td>
<td>751</td>
<td>725</td>
<td>845</td>
</tr>
</tbody>
</table>
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’


Dr. Sandra Jarrett received US$ 2,420.89 from Research and Publications in support of her project, “Synthesis of 2 Amino-4-Vinyl thiiazoles, 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 UWT’.


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 γ-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

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) cyanobridged 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


• ‘The development of poly-pyridyl-like molecular sensors’, Prairie 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

- “Interactive Web Page Development with CHIME and JAVA” at the Department of Chemistry, Bristol University, UK, in July 2003.

Dr. Paul Maragh


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


PUBLICATIONS

Refereed


* 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, $\text{Ca}_8(\text{Al}_2\text{O}_3\text{)(CrO}_4)_2$: phase transitions and high-temperature structural evolution of the cubic phase. Canadian Mineralogist, 2004; 89(4)


* M. Bakir, S. A. Clarke, I. Hassan, R. J. Lancashire and M. Singh-Wilmot, *trans*-Bis(glycinato-k²N,O)copper(II) 4-bromophenol solvate *Acta Crystallographica* 2004, E60, m868.


* 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.

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:
– 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**

**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
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).

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

– 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.


• “What drives infrastructure spending in cities of developing countries?” City Futures International, Chicago, USA, July 8-10, 2004

W. Bailey


D. Barker


T. Jackson


S. Mains


• “(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.


• “Memory and migration: documenting the Jamaican diaspora.” Annual Conference of the Caribbean Studies Association, St Kitts, May 2004.

S. Mitchell


R. Sietchiping


B. Spence
• (with E. 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.


E. Thomas-Hope


• “Caribbean migration and diaspor: from labour migration to transnationalism.” UNESCO workshop on Conceptualizing Caribbean Migration and Diaspora, UWI, Mona, March 6, 2004.


PUBLICATIONS

Refereed


* 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.


Non-Refereed


**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.
- 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 in Development Studies*.

### CATEGORIES OF STUDENTS

#### Undergraduates: Geography

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#### Undergraduates: Geology

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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 Ascidiae 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
– Constructed 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


- 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


• Hibbert, M. 2003. Seminar “Kingston Harbour in the Year 2025”


PUBLICATIONS

Books


Refereed papers


**Non-refereed papers**


**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

STUDENTS AND COURSES

Performance in courses:

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**Prizes Awarded**

The following students were formally recognized for quality academic performance.

- **Preliminary Biology**
  - Iliya 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 = MOna Repository of REusable Software Assets), 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 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

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.


**PUBLICATIONS**

**Refereed**


**DEPARTMENT OF PHYSICS**

Donald Walwyn, BSc, PhD **UWT – 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

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 Taniece 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


International Symposium on Measurement, Analysis and Modeling of Human Functions, Genova, Italy, June 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](http://www.AIACCPROJECT.org)


- **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

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

* Skobla, J., “GPS and Electronics” Science, Technology and Innovation UWI Leading Nation,” UWI Proceedings, 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:**

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<th>Course</th>
<th>No. sat exam</th>
<th>No. passed</th>
<th>Pass rate %</th>
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<td>P04B Preliminary Physics B</td>
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<td>P23F Optics &amp; Oscillations</td>
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<td>P25F Materials Science 1</td>
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<td>P33G Physics of Climate</td>
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<td>P33H Fluid Dynamics and Renewable Energy</td>
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<td>P34F Digital Signal Processing</td>
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<td>P34G EM Transmission and Propagation</td>
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<td>P34H Digital Communications</td>
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<td>P34P Electronics Project</td>
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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 Tharmanathan 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.