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This publication of award-winning research projects is proof beyond a shadow of doubt that UWI is transforming itself into becoming a more research-driven institution. Our researchers are deeply engaged in knowledge generation needed for economic growth and development of the region and improved quality of life for all. These scholars work assiduously in their search for answers to the many problems that confront us and impede our efforts to be innovative and competitive in today’s world.

This booklet documents The UWI’s impressive probe into important cultural phenomena; invasive pests that threaten our food supply; climate change and its effects on our agriculture; biodiversity problems; pregnancy-related issues; tropical diseases that plague our people; adequate and secure food supplies, HIV/AIDS programmes, the teachings of eminent social scientists, the operations of small businesses, ICT research and much more.

It is in full recognition of the need to facilitate new discoveries that The UWI uses this occasion to salute its intellectual giants whose stellar achievements constantly expand the frontiers of knowledge and scholarship. As these frontiers expand it is my hope that the next generation of scholars will be inspired to advance knowledge and discovery as today’s awardees have demonstrated.

The leadership of The UWI resolves to make the research agenda a priority, even in face of our resource constraints. It is our relentless goal to excel in our current research output and to sustain our reputation until our impact and reach are felt locally, regionally and globally.
FACULTY OF

HUMANITIES

&

EDUCATION
“Emancipation as Empowerment: Blacks in Jamaican Vestries, 1850-1865”

The article examines the political process by which free blacks and former enslaved men, in the first fifteen years of the second half of the nineteenth century (1850-1865), sought and won election to the vestries and common councils of the towns of Kingston, Spanish Town and Montego Bay, and those of Metcalfe, Port Royal, Portland, St. Andrew, St. David, St. John and St. Thomas in the East.

From 1667 parish vestries were the political institutions through which Jamaica was locally governed and were constituted of twelve elected members, qualified by their property, ten of them vestrymen, and two churchwardens, together with the ex officio members, the Custos, the Magistrates and the Rector of the Anglican Church.

During the slavery period, in the absence of a civil service, the vestries administered the affairs of the parish, levied taxes on the stock on estates (slaves and cattle), appointed and paid the very few public officers and exercised, through patronage, influence on the very small number of white male parishioners qualified by property to be electors. Indeed, up to emancipation, the vestry was a bastion of white power.

However, as emancipation approached, Jamaica’s ruling white minority strategically made common cause with other slave owners, notably the increasingly affluent Jewish merchant class and the better-off free coloureds. Accordingly, in 1831, the male population of free blacks, free coloureds and the Jews were granted full civil rights, and emancipation in 1838 extended these rights to former enslaved males.

Blacks in Jamaica saw no future for themselves under public institutions that were exclusively controlled by whites. Indeed, the black politicians asserted that emancipation had ‘invested’ them ‘with the rights of British Freemen’ and they struggled for civil rights and political inclusion in the post slavery period, despite a restrictive gender and property franchise that barred most freed people from formal political activity. Those freedmen who qualified for the franchise participated enthusiastically in the island’s politics since the privilege to vote was an important badge of freedom and the surest way to promote their interests. However, since none of the former enslaved qualified for membership of the Assembly because of the very steep property qualifications, their ambitions for political office could only be satisfied at the lower level of the vestry where any freehold voter qualified for election as a vestryman. Thus, it was in the vestries that the freedmen’s passion for political inclusion found its most forceful expression.
The article assesses the results of the black activists’ campaigns in relation to the topography of the parishes, and to the effects of the international economy on sugar and coffee estates. Decline in the value of these products meant that land was sold in small lots to blacks who thus became qualified by their newly acquired property. In enough numbers in a parish they could change the racial complexion of the vestry, which in the early post slavery period mirrored the varied fortunes of the plantation economy and the emergence of a new mostly black peasant class. Thus, parishes where sugar estates, coffee plantations and livestock pens maintained their respective dominance (Clarendon, Hanover, Manchester, Trelawny, St. Ann, St. Catherine, St. Elizabeth, St. James, St. Thomas-in-the East, Westmoreland and Vere), blacks had little sustained impact on the composition of the respective vestries, though in the important towns of Kingston, Montego Bay and Spanish Town, alliances with Jewish retailers and progressive free colours enabled some blacks to successfully infiltrate vestry politics.

In contrast, the research demonstrates that by the 1850s, in parishes where sugar and coffee economies declined (Metcalfe, Portland, Port Royal, St. David and St. John), black artisans, retailers and small settlers gradually infiltrated the vestries and successfully wrestled with the planter class for political sway. Indeed, by 1865 up to sixty black men had been elected as vestrymen.

The article examines in great detail the characteristics of those who successfully, for the most part, asserted their claim to be members of the vestries. They were black men who were free before Emancipation, including Maroons, and the former enslaved blacks holding freehold titles to land varying in size and occupation: bakers, tailors, carpenters, blacksmiths, shoemakers, tinsmiths, masons, preachers, teachers and retailers of liquor. Carefully examined too are the alliances of the newly enfranchised blacks with other political aspirants, Jewish retailers and progressive colours, the antagonism of the whites and the wealthier free colours towards the efforts of the blacks to be elected.

The article delineates the activities of black political organizers, telling how, when and where they succeeded or failed. Importantly, among these political activists were blacks based in Kingston who acquired freehold property in the neighbouring parishes which enabled them to extend their political influence into those areas. Three of the black political organizers - Samuel Clarke, a carpenter, Thomas Harry, a shoemaker, and William Kelly Smith, a printer - were detained under martial law as “political prisoners” during the period of vicious suppression of the Morant Bay rebellion. Thereafter, the introduction of crown colony government in 1866 snuffed out all expressions of representational politics and the vestries were swept away, depriving the blacks of the institutional framework to exercise and assert their new political privileges.

The detailed research underscores the complex and inclusive politics in Jamaica in the immediate post slavery period, successfully refuting one tendency in the historiography to view the black freedmen as being
politically apathetic or uninterested in the affairs of state that impacted the quality of their lives.

The article is a significant addition to our knowledge of Jamaican society and politics during the crucial and formative post slavery period.

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Have you ever wondered why there are now so many ‘Bling’ funerals? And why some obviously poor people spend so much money on the dead? Does it have any relationship to our culture?

This researcher, Dr Donna Hope, visited several prominent ‘Bling’ or celebrity dancehall funerals and others not so prominent but just as bling and spectacular, during the period 1999 to 2008. Two prominent Bling dancehall funerals at which she took notes, photographs, made recordings and did mini-interviews to capture the details of this type of funeral activity in Jamaica, were those of dancehall icons William “Willie Haggart” Moore in 1999 and Gerald “Bogle” Levy in 2005. Dr Hope also participated in the traditional wake, setup and funeral proceedings at rural and urban funerals for ordinary Jamaicans of different age groups, to compare and contrast the various types of funerals taking place in Jamaica at this time.

Changing Culture, Changing Funeral Practices

As Jamaican society and culture move into the 21st century, many traditional cultural practices are undergoing change. The rise of new or additional cultural practices in the mourning and funeral setting is one such change. Bling/dancehall funerals are radically different from the traditional and accepted forms of sober mourning that have long been identified as socially appropriate. They are full of fashion and style, colour, noise, vibes, dancehall and non-traditional music and riotous displays of material wealth (real or imagined). The dearly departed is branded and immortalized on buttons, book markers, t-shirts, posters and in the colourful and bashment montage of colour photographs that are a must for most funeral programs today. Many Bling/dancehall funerals ignore, partially or totally, the traditional Christian rites and rituals, and introduce more secular or worldly practices into the mix.
Celebrating Life in Death

Celebrations of one’s life at death have long been a part of Jamaica’s working-class culture. It is common in many communities, rural or urban, for poor individuals to be given fantastic and expensive funerals that are far different from the life they lived, often at the expense of their “foreign” children or relatives or even the local politician. Dr Hope’s research found that for many ordinary and poor Jamaicans, ideas about wealth, celebrity and superstar status are created and spread on the backs of many new and changing cultural practices, including the graphic and spectacular displays at Jamaica’s Bling/dancehall funerals.

Yet, even while they may seem new and different, Bling/dancehall funerals are related to the traditional and what some described as “boring” funeral rites, including setup and wakes, in the same way a child is related to his or her parents or grandparents. But they are far different – pulling together African retentions, North American influences and the materialist superstardom that is one component of dancehall culture – because the excitement and bling of dancehall culture provides fleeting opportunities for many individuals to create fantasies of being superstars and celebrities, which sometimes become real. As a part of this journey to celebrity status the relationship between life on stage and the activities during the final staging of activity on earth – the funeral – [is also important and] has become a critically important stage for the life and death of many individuals in today’s Jamaica.

The role of traditional culture and its obvious transitions in 21st century Jamaica is a critical and challenging area for researchers, policymakers and even parents. As such, it is important for researchers to understand how and why ordinary individuals are encouraged to work out their identities in a society where people are ranked based on their class; and to relate this to how power is shared and identified among different classes in Jamaica.

Dr Hope’s work effectively captures the changing forms of funeral activity and contributes significantly to an understanding of the cultural and social meanings that underwrite these spectacular Bling/dancehall funerals. It provides one critical point of reference for individuals and researchers who seek to provide meaningful responses to, and strategies for change in, the state of impoverishment faced by many of Jamaica’s urban and rural poor.

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The book Dancehall: From Slave Ship to Ghetto is the only publication to date that has documented the institutional, industrial and cultural significance of Jamaican dancehall in local and transnational contexts. A large part of the research on dancehall culture is contained in generic histories of reggae which have mostly documented icons and their musical contributions.

By looking at over 400 years of New World history, DanceHall reveals a complex web of cultural practices, politics, rituals, philosophies, and survival strategies that link Caribbean, African and African diasporic performance. This book establishes that even as Dancehall’s popularity grows around the world, a detailed understanding of dancehall performance space, lifestyle and meanings is missing. Author Sonjah Stanley Niaah relates how dancehall emerged some sixty years ago from the marginalized youth culture of Kingston’s ghettos and how it remains inextricably linked to the ghetto, giving its performance culture and spaces a distinct identity of being marginal yet central to national identity.

Dancehall as Industry and Institution
Consistent with approaches at both the regional and national levels to advance creative industries as a priority for development, Dr Sonjah Stanley Niaah has championed the collection of data about this growing and important industry. Phase one of her research - which is documented in Dancehall - reveals how dance movements, the system of events and their uses, norms, and ritual practices, link dancehall to other musical styles, such as the blues, kwaito and reggaetón. Dancehall is part of a legacy of celebration that reaches from the dance shrubs of West Indian plantations and the early
black churches, to the ballrooms of Manhattan. This phase of the project, which maps Black Atlantic performance geographies, stretches across the Caribbean, United States, Puerto Rico and South Africa to construct a detailed portrait of dancehall in local, regional, and transnational contexts. She reveals how dancehall travels across national boundaries through new media and touring mechanisms used among creators and perpetuators of dancehall performance practice.

The book documents that many have found their livelihood in producing and consuming dancehall music and culture. With over 6000 directly employed, up to 43,000 persons supported by it, dancehall is arguably one of the biggest industries in Jamaica. Its infrastructure is impressive and as an institution in its own right it is both understudied and underutilized. There are
and performative legacies and traditions of dancehall. DanceHall will also increase cultural awareness and development, while building a platform for intercultural exchange and development of strategies for engaging creative industries locally and internationally. Importantly, the materials generated in all phases of the author’s research into Jamaica’s music and culture will form part of the database available through the still nascent Jamaican Music Museum of the Institute of Jamaica.

Significant policy implications crucial for national development have emerged from the research, including the need to assess the culture of violence in the wider Jamaican context as well as institutionalized by the state: the review of legal frameworks that exploit and hinder the advancement of creative industries and creative work; demarcation of zones for venues, and licences for the range of entertainment events, with a view to advancing efforts to sustain identities and livelihoods as criteria for development.

Finally, DanceHall combines cultural geography, performance studies and cultural studies to examine performance culture across the Black Atlantic. It creates new disciplinary spaces for the study of culture which is productively engaged by the author, revealing mature debates around sexuality, violence, street life and cultural identity in a postcolonial Jamaican context.

Why a Study of Dancehall?
The Creative Economy Report (2008) recognises the role of culture in the fight against poverty and suggests that work be immediately oriented towards investment in infrastructure to support creative work and possibilities for the arts, innovative development of cultural policy and research. Arguably, cotton, nuts and coffee beans are not the future’s weapons against poverty; these are performances, compositions and other works of art. Today creative industries are the most dynamic sector in world trade, representing a total export value of nearly 425 billion dollars in 2005. Developing countries are still grappling with how to harness resources from such industries or even how to facilitate the further development of cultural traditions and enterprise. While there

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Have you ever wondered who is a real Jamaican man? And why so many men are interested in Badmanism? Why is there so much talk about Badman, Gunman and Shotta in dancehall? Why are so many men “dressing like girl”? And why are there so many new male dancers and dance groups in dancehall?

Since 2002, this researcher, Dr Donna P. Hope, has been taking notes, conducting interviews, making recordings, taking photographs and making many many visits to dancehall events as part of her in-depth examination of how Jamaican masculinities were being discussed and transformed in dancehall and working-class culture. She also wanted to understand how Jamaican working-class men were being identified by both men and women, as well as how these men were identifying themselves in Jamaican culture and in dancehall culture.

Man Ah Man?
Jamaican society and culture provide road maps as part of an ongoing process to teach young boys and adult men how to become “real men”. Jamaican families, peer groups, media, schools, churches, legislation and even language, all contribute to cementing and projecting the “correct” ways of being a “real man” in Jamaica. Indeed, there are several tenets of how to be male that are held up in traditional Jamaica and these have become very rigid and cast in stone for many working-class men. For example, a man must be strong, in control and in charge. He must not be afraid of anyone and must “can defend it” – not by “tracing,” which is a “woman ting”, but by fights, beatings, stabbings and even shootings.
Further, a “real man” must have intimate relations only with women and provide visible evidence of his fertility, productivity and virility – children – whether he can take care of them or not. Being able to provide or at least show some wealth at different levels is also important, so material things like cars, jewellery, clothing and the ability to spend money is critical. There are also several taboos – things that a real man should not and cannot do – as they will contaminate, reduce or totally eliminate his manhood. These include acting emotional, dressing “like a girl” and having intimate relations with other men.

**Identifying Different Types of Dancehall Males**

Dancehall culture’s extreme and graphic lyrics and posing build on these social and cultural notions of masculinity that come from the belly of Jamaican culture to promote and highlight who is a real, hardcore Jamaican man. Dr Hope identifies what she calls five prominent masculine debates in dancehall music and culture – Ole Dawg or promiscuous heterosexuality, where a man must have sexual relations (and children) with many women; BadMan/Shotta or (gun) violence, where the Badman who can defend it or who is a real gunman or Shotta is one of the most prized versions of masculinity in dancehall; Chi Chi Man or anti-male homosexuality, where “bunning ah fiya” on male homosexuals and male homosexuality is crucial in the preservation of real hardcore masculinity; Bling Bling or conspicuous consumption and posing, where men with material wealth and the ability to showcase this in conspicuous ways become superstars in their own right; and the newest and most recent addition: Fashion Ova Style, which is a fashioned and styled dancehall version of the “real hardcore man” that is related to the North American and European metrosexual, where men spend greater and greater amounts of time and money on their clothes, hairstyles, jewellery, skin – oftentimes rivalling women in their desire to look good and to take over dancing and posing in dancehall’s videotlight.

Researchers and policymakers have been concerned about Jamaican masculinity over the last three decades and some work has been done to try and engage with and understand the process of being a man in Jamaica. Dr Hope’s latest research, set out in great detail in her award-winning book Man Vibes, unravels some key factors involved in the cultural process of male identity formation in the working classes. It also provides another avenue on the road map for analysts, researchers and policy makers who try to find answers to the current problems with male development and socialization.

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Claudette Williams

The Best Research Publication: Books

The Most Outstanding Researcher
“The Devil in the Details: Cuban Anti-Slavery Narrative in the Postmodern Age”

A popular theme before emancipation, the subject of Caribbean slavery continues even today to inspire national debates. One recent indicator of the presence of the past in the Americas is the renewal of calls for reparation and apologies for the forced transplantation of Africans and the subsequent exploitation of their labour in Europe’s empire-building project. Traditional postcolonial studies have been dominated by generalizations about slavery, its practices and personalities. However, new perspectives of the slave experience have been emerging in recent years.

As part of a shared historical experience, slavery transcends the linguistic and political peculiarities that separate the Anglophone Caribbean from its French and Spanish-speaking neighbours. Cuba boasts a rich tradition of fictional narratives on the slavery theme. In the nineteenth century progressive white Creole writers composed numerous stories and novels protesting the evils of slavery. These compositions have been studied for decades by regional and international scholars. Many of these studies have reflected nationalist biases. For the most part the Cuban response has been generous, celebrating the revolutionary political significance of these writings but ignoring some of their counter-productive elements. On the other hand, reviewers of an Afro-centric persuasion have viewed the white Creole accounts with suspicion at best, and at worst have diminished or denied their pedigree as a form of protest against slavery.

A Lens of a Different Colour

The Devil in the Details: Cuban Anti-slavery Narrative in the Postmodern Age, authored by Professor Claudette Williams, uses a lens of a different colour to resolve the conflict between these two interpretations and to produce readings of these old books for new times. In expanding and deepening previous research on the subject, this study suggests other ways of understanding well-known narratives from the period, in addition to shedding light on compositions which have received little attention. Using a variety of literary tools, the author re-energizes the study of this body of literature, paying attention to both the frequently overlooked constructive achievements and the well-advertised shortcomings in each text. The research draws upon the historical studies of Cuban and Caribbean scholars, but goes beyond a narrow socio-historical interpretation by employing psychological concepts and literary and cultural theories.
**Key Difference**

The reference to “details” in its title signals one key difference between the approach used in this book and that of others published on the subject since the 1970s. In a close examination of six narratives the author pursues subtle elements – silences, gaps, voicelessness, ventriloquism – and various indirect strategies that the novelists use to undermine the ideas that sustained slavery. Many studies of these narratives have turned the spotlight on the slave characters, leaving the representations of the enslavers mainly in the shadows. But Williams’s analysis of the evidence demonstrates that for the novelists the enslavers were of equal and sometimes greater interest than the enslaved who were their victims. Of particular value in Williams’s account is the disclosure of the complexity of the enslaved-enslaver relationship as presented by the writers. She concludes that by casting the enslavers in the role of slaves themselves, enthralled by their neuroses, paranoia and insecurity, the writers were making a powerful antislavery statement. Similarly, the novelists have been criticized for promoting only submissive slave images. Williams’s book corrects this perception by drawing attention to the instances of psychological resistance and controlled defiance on the part of the slaves in these works.

**Dismantling the Stereotypes**

The Devil in the Details dismantles the stereotypes, myths and misconceptions that surround these stories and illuminates certain blind spots in earlier appraisals of the texts. The author’s postmodern approach uncovers the diversity, contradictions and ambiguities in these fictions which, as she explains, are “narratives of resistance and surrender, cowardice and heroism, adaptation and alienation, defeat and survival.” Multiple and sometimes contradictory meanings are unearthed in these stories whose message had for a long time been seen as singular and uncomplicated. There has been a tendency to collapse all the narratives into a single category and to speak about them in the same breath. But The Devil in the Details reveals that the writers represented slavery as a diverse and multifaceted institution and they treated slave and slave owner alike as complex human beings with different temperaments and motivations, [who were] liable to change over time.

**Caribbean-wide Relevance**

The Devil in the Details is a specific invitation to reassess the literary contribution to the antislavery cause in one colonial Caribbean society. However, the analytical model that it proposes is of general relevance to new understandings of the wider Caribbean experience. As a model that advocates a balanced appraisal of the entire region’s history and its postcolonial reality, it can facilitate the process of shaping and redefining Caribbean identities in the age of postnationalism and globalization.

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Marceline Collins-Figueroa

The Research Project with the Greatest Business/Economic/Development Impact
Jamaica has a high biological diversity and is rated as the fifth most diverse island in the world with regard to its endemic plants (plants that grow only in Jamaica), and the highest in the Caribbean in respect of its endemic land birds. Its flowering plants, reptiles, amphibians, insects and terrestrial molluscs are diverse. It also has a wide variety of terrestrial, aquatic and marine ecosystems: dense wet forests, dry savannahs, caves, rivers, wetlands, sea grass beds and coral reefs. These ecosystems provide provisioning services such as food, water, shelter and space to the diverse flora and fauna of the island. They also provide regulating services (e.g. climate, flood and disease regulation and water purification), supporting services (e.g. nutrient cycling, soil formation) and cultural services (e.g. spiritual, aesthetic, educational and recreational). Moreover, many people believe that biodiversity has intrinsic worth.

Many plant and animal species in Jamaica are listed as threatened or endangered, mainly because of human activities such as unsustainable harvesting and consumption of resources, habitat loss, pollution, introduction of invasive alien species, and other activities that lead to global climate change. Given this threat to biodiversity, Dr Marceline Collins-Figueroa decided to work towards appreciation, conservation and restoration of biodiversity in teachers’ colleges. Although biodiversity was studied in science and social studies curricula, it was often limited and abstract, so Dr Collins-Figueroa felt that there was need for a hands-on approach to biodiversity education across disciplines and sectors in the colleges.

The Project
Representing the UWI’s Institute of Education/Joint Board of Teacher Education, Dr Collins-Figueroa used the opportunity of a call from the Environmental Foundation of Jamaica to bid successfully, together with the Jamaica Environment Trust, for funds to implement biodiversity education in teachers’ colleges across Jamaica. The project was implemented in early childhood and primary education programmes in eight teacher education institutions. It aimed to integrate biodiversity content and to build skills, competencies and values across all disciplines, in extracurricular activities such as in clubs, and in the day-to-day operations of the colleges, with an emphasis on the conservation and sustainable use of biological resources.

Cross-Curricular Approach
Guided by a project coordinator from within each college, lecturers and students chose a theme in biodiversity around which they planned action projects. They integrated numerous concepts from their theme into numerous disciplines. At St. Joseph’s Teachers’ College, for example, lecturers across seven disciplines collaborated around vegetable gardening, integrating the theme into classwork and coursework.
assignments, as well as an action project of planting, growing and reaping vegetables for sale and use in the college canteen. The students created tyre gardens of vegetables that they took to their practice schools, especially where there were no green spaces.

Action Projects
In addition to teaching and learning resources, each college community developed outdoor action projects through the involvement of faculty, students, and often, ancillary and administrative staff. At the end of the second year of the project, a record was made of the projects: Bethlehem College - a herbal garden; Church College – a herbal and vegetable garden with supporting compost and plants labelled; CASE - a bird sanctuary; Edna Manley College - a cage house with habitat for swallowtail butterflies; Moneague College – a shade house in which fern plants were cultivated for in situ conservation of sections of Fern Gully and plants labelled; Sam Sharpe College - an embryonic nature park; Shortwood College – a herbal garden; St Joseph's College – a vegetable garden with supporting compost. These project areas were used as teaching and learning sites for numerous disciplines. Through the processes of developing them, participants learnt about the conditions and requirements for specific species to thrive and survive and developed the competence to impact biodiversity.

Teaching, Learning and Assessment Strategies
A variety of teaching and learning strategies was used, including college grounds and off-campus studies: observing and identifying organisms, the interrelationships among them, their distribution and diversity, and how human activities affected them. Debates on the effects of economic activities on the natural environment, and critical analysis of how the natural environment is represented in literature texts, dominated language arts. Music, dance and visual arts classes delved into representations of the
college’s chosen theme in visual and performing art forms and the lesson plans of student teachers. Biodiversity in mathematics involved counts of organisms, working out densities of species, measurements in gardening plots, statistical computations, and reporting of data. Documentation often utilized technology for displays: power point presentations and videos. Interest in the use of medicinal herbs propelled all the first year students of Bethlehem College to survey the species of medicinal herbs that were used by people in Malvern. This led to community members supplying the students with samples of herbs which the students used to propagate a herbal garden. They researched the uses of the herbs and developed a roving exhibit on medicinal herbs, which they shared at exhibitions in other colleges.

Research
As the project director facilitating workshops with teacher educators and through visits to the colleges, Dr Collins-Figueroa collected data to document the approaches and strategies used in biodiversity education in the colleges. Data on educators’ and students’ views and practices in cross-curricular integration and action projects were sought through face-to-face interviews, student focus group interviews, field notes from observations, and journals. Notes were also taken at meetings in which educators from all the colleges met to reflect on project implementation. Teacher educators also documented their experiences in case studies that have contributed to our understanding of the strategies needed for successful implementation of cross-curricular work and whole college approaches through infusion. These studies sensitized educators about the interests and tremendous capacity of student teachers to be innovative and organized. Educators were struck by the sustained involvement of the students in project activities outside the classroom and beyond the requirements of their courses. Interviews with students revealed that the project afforded them the opportunity to explore nature and to plant and reap vegetables for the first time in their lives. Some who graduated after the first year of the project returned to the colleges to support the ongoing work and to tell of their contributions to agricultural biodiversity at their schools.

Challenges
The disciplinary cultures and interests of educators and their lack of a tradition of constructing local knowledge often dimmed their recognition of the benefits of such a project to their own discipline, curriculum delivery, and student learning. In addition, lack of support from some college administrators, and a perceived lack of time because of “packed curricula” also diminished the achievements in some colleges. Moreover, any outdoor project involving the natural environment was prone to setbacks due to drought, hurricanes, pests, diseases and praedial larceny. Despite the challenges, however, committed leadership of the coordinators in the colleges and their passion and moral purpose, enabled many to strike a balance between competing demands, and to engage students in taking responsibility for lessening the gap between their everyday lives and the college curriculum.

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FACULTY OF
Pure & Applied Sciences
DAVIDE BATIĆ
THE BEST RESEARCH PUBLICATION: ARTICLES
AND COLLABORATOR
In the paper “Fuzziness at the horizon” written together with Dr. Piero Nicolini (University of Frankfurt, Germany) the researchers proved that non-commutative geometry inspired black holes are stable when perturbed with matter. The relevance of this result is very high since it shows that Non-commutative Geometry as a candidate theory of Quantum Gravity can solve the instability problem of classical black holes emerging from Einstein’s theory of gravitation. Finally, their findings are extremely relevant for the international scientific community since mini black holes are expected to be created in upcoming experiments aimed at discovering the Higgs boson at the Large Hadron Collider in Switzerland.
Jamaica at the Forefront of Scientific Research

One of the unsolved puzzles in science occupying the minds of the leading scientists is to find the quantum version of the geometrical Einstein's gravitational theory. The present work is a step taken towards solving this frontier problem. The benefits for Jamaica in general and the scientific community in this country in particular are manifold. The participation in such important projects would bring Jamaica to the forefront of scientific research all over the world. This issue is of utmost importance for the development of any country. For Jamaica the involvement of postgraduate students in such ventures will allow them later on to find postdoctoral positions in leading scientific institutes of the world and bring back the knowledge and technological know-how for further development of youth and science in this country. Apart from that, training in rigorous analytical methods will surely reflect in the creative development of young minds and Jamaican society in general.
The Article Receives Lots of Attention

The paper “Fuzziness at the horizon” is published in Physics Letters B in 2010. Physics Letter B is an international peer-reviewed journal with a very high impact factor (5.083).

Published on the 3rd of July 2010, the publication has been already cited 11 times in only five months in several international journals as can be seen at the link


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Tannecia Stephenson | Jayaka Campbell
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AND COLLABORATOR

The Best Research Publication: Articles
“Future Climate of the Caribbean from a Regional Climate Model”

Planning for the Future
So, as a government minister you want to put in major infrastructure that will stand the test of time (or at least the next one hundred years); or as an agro-entrepreneur you want some advice to enable you to choose wisely your long-term investment crop. Or you are in the health service and you want an idea of how to deploy resources in years to come based on which disease – dengue, asthma or malaria - will be more prevalent; or maybe you are a water supplier and you want to know whether you should be thinking of more or less wells going into the future. The common thread is climate! And the common question is: “So what will it be like fifty, sixty, ninety years from now?”

In order to answer the question, computer models have to be run. These models are based on the laws of physics, but also take into account storylines (or scenarios) about how the world will develop technologically, economically, and population-wise. Under different storylines, the models give a picture about how the temperature, rainfall, humidity, pressure (and many other meteorological parameters), might change over the world as the century progresses. Pretty neat! But there is one problem: because the models have to be run over the entire globe they miss some smaller but very important details, e.g. the small islands of the Caribbean region! So what to do?

Finding Solutions
One solution, as done by the Climate Studies Group, Mona (CSGM) located in the Department of Physics, was to run a more refined version of the ‘big computer models’ over just the Caribbean alone, and in such a manner that the Caribbean islands could be seen. Along with collaborators from Barbados, Cuba and Belize, the PRECIS model (where PRECIS stands for Providing Regional Climates for Impact Studies) was run over the Caribbean region to find out what the climate of the Caribbean will be like at the end of this century. This was the first time anybody was attempting this for the region. So, based on the results, the group should be able to answer the questions: “Will the Caribbean be hotter or cooler? wetter or drier?”

Under the global warming storylines, everywhere in the Caribbean will be a hotter place – significantly hotter too - by two to five degrees. And there won’t be much relief by moving higher up the hills, as higher altitudes will warm too. At the same time, the Caribbean will also very likely be drier (up to thirty percent drier), especially between June and October. That means less rain during the months when we normally receive our most rain! But that does not necessarily mean we will get no rain at all. In fact, when we do get rain it will likely be more intense, but over
fewer days, according to the model.
So, as a government minister, agro-
tenrepreneur, health service provider, or water planner, the research has provided some information to guide you in making your long-term decisions. Sure there are uncertainties and yes, there is more work to be done to get a better picture of the future. But for now you have a first guess at what the future climate of the Caribbean will be like, and isn’t that better than having no guess at all?
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"Climate Change, Drought, and Jamaican Agriculture: Local Knowledge and the Climate Record"

This research is focused on Southern St Elizabeth which is a major source area for domestic food within Jamaica. Despite a semi-arid climate in a rain shadow zone the area is Jamaica’s principal vegetable producing region and supplies urban areas and tourist hotels. Farmers have developed agricultural methods to cope with low rainfall, and produce fruit and vegetables by utilizing mulching and improvised irrigation systems. Over the last 20 years, this area (like other regions of Jamaica) has been impacted by increasing climate variability and by a flood of cheap, imported food imports following trade liberalization.

Understanding Drought & Climate Change in St. Elizabeth

The purpose of this study is to reach a basic understanding of drought and climate change in southern St Elizabeth. The approach is to integrate local farmers' knowledge of their farming systems, their perception of drought and their efforts to cope with drought, into the physical characteristics of drought derived from remotely sensed precipitation data. Local knowledge and perceptions are investigated through a questionnaire survey of sixty farmers in St Elizabeth. The physical characteristics of drought are examined through statistical analysis and modelling of satellite precipitation and vegetation vigour time series.

Farmers Concerned about Drought

The survey results confirm that most farmers are concerned about an increase in drought occurrence. In the absence of detailed actual precipitation data from local weather stations, estimates of rainfall for St Elizabeth were derived from satellite imagery and statistical modelling. Estimates of local precipitation over a twenty-year period support farmers’ perceptions and suggest that severe drought events are becoming more frequent. The satellite precipitation time series also suggests that the early growing season is becoming drier compared to the primary growing season, especially since 1991. This recent divergence in growing season moisture conditions provides scientific support for the farmers’ observations that drought is becoming more prevalent. There are important subtleties in these perceptions which affect farmers’ decision-making, such that farmers’ perceptions of drought are not driven by magnitude and frequency of dry months alone, but rather by the notable differences between growing seasons and the implications for the timing of their farming activities. Thus, any development of drought adaptation and mitigation policy and plans must not focus solely on drought; it must also compare moisture conditions between months and seasons to be effective.

The research has a number of integrated elements and components which underline the significance of collaborative research between UWI researchers and other universities. The work on local farming systems in southern St Elizabeth is part of the doctoral research of one of the authors (Donovan Campbell). The research initially focused on the impacts of natural hazards on farming, but evolved into a study of the impacts of climate change and economic trade liberalization, and the vulnerability and adaptations to change of farming systems and farming communities.
The questionnaire data for this paper was funded through a small research project funded by Graduate Studies and Research. This project involved working with one of the paper’s co-authors (Duncan McGregor) and resulted in several international conference presentations and two additional peer-reviewed publications. Our American university counterparts are a group of physical geographers working on climate change in the western Caribbean Basin. They became involved after exposure to our ideas and results at a UWI conference organized by the Department of Geography and Geology. We developed the idea of comparing and integrating the results of our farm surveys with their precipitation data estimates in the study area, and organized a field visit to southern St Elizabeth for their team.

Problems with Domestic Food Production

Over the last two decades, domestic food production in Jamaica has been beset by a series of external processes and events – dismantling of trade barriers and trade liberalization and a succession of calamitous natural hazards which may be linked to climate change. Several periods of drought, of which the most recent El Nino-related event 2009-10 was the most serious, plus a devastating sequence of hurricane and tropical storm events, have caused serious damage to the agricultural sector. In the last couple of years the Jamaican Government has managed to confront WTO rulings on food imports to establish mechanisms that afford a measure of support for Jamaica’s beleaguered small farm sector. Together with other measures, there has been a measurable decline in food imports. However, the flood rains associated with tropical storm Nicole in September 2010 and a resultant surge in food imports are a timely reminder that the vulnerabilities faced by farmers have two external sources: the economic environment and the physical environment.

More Research Needed

Much more research is needed on how Jamaican agriculture can adapt to climate change, and to explore possible mitigation strategies, at both the national and local level. This research illustrates one potentially useful avenue by focusing on rural sustainable livelihoods and small-scale domestic food production systems. By investigating farmers’ perceptions of drought and attempts to adapt to changing weather patterns, it is possible to identify and distinguish between coping measures that are within the farmers’ abilities and resource capacities, and measures that will require external interventions by government and/or aid agencies. These research ideas can be extended to other facets of climate change (such as hurricanes, tropical storms and flood rains), and to other agro-ecological zones in Jamaica.

The Research Provides Valuable Information

The researchers have demonstrated at the local level that research into climate change and the vulnerabilities and resilience of farming communities can usefully combine the work of environmental scientists with human geographers focusing on local farming systems and sustainable livelihoods. Farmers and farming communities must be integral partners in such research enterprises. The field methodologies used by geographers at UWI, which involve in-depth and detailed field research and spending many weeks living in these communities, is critical towards building local understanding, trust and mutual respect between local people and university-based researchers.

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The Most Outstanding Researcher
Post-Harvest Science
During the last decades, the demand for fresher, higher quality attribute, and safer fresh fruits and vegetables increased considerably and has consequently promoted research on new and modern technologies for preservation of fresh produce and the extension of shelf-life. However, the continuous metabolism of the fresh harvested crops limits their application, and sometimes results are not those expected. To expand the use of new processes in the post-harvest industry, combinations of these technologies with traditional or emerging preservation techniques are being studied. The use of new techniques in combination with other preservation technologies presents a number of potential benefits to the preservation of fresh produce.

Recently, researchers introduced the concept of ‘omics’ to investigate the post-harvest behaviour of fresh crops. The technology ‘metabolomics’ - based on the “metabolite profiling of the system biology” - was introduced to investigate the metabolome variation during the post-harvest life of fresh crops. By understanding the metabolome, the researchers could identify the undesirable compounds and their biosynthesis pathways. This would lead to the development of physical and/or natural inhibitors of these metabolites. By inhibiting the biosynthetic pathway of these metabolites, the deterioration process will be slowed down and the shelf-life extended “naturally”.

Shelf-Life Preservation
Fresh produce, particularly tropical fruit, is usually held for periods between harvesting and marketing so as to match the market demand. However, during storage the produce is exposed to severe environmental and atmospheric conditions, mainly high temperature, and these unfavourable conditions affect their physiology and biochemistry. During this period also, high metabolism is considered the main cause of changes in quality, water and weight losses, decay and other disorders. Fresh plants and produce are aerobic organisms and rely on oxygen to survive. Moreover, plants and stored crops experience environmental stresses, attacks (from microorganisms and pests), occasionally low oxygen availability (hypoxia) and (less frequently) total absence of oxygen (anoxia), due mainly to environmental factors such as bad stacking during transportation, inadequate storage or packaging, or anatomical structure of some tissues. The biochemical and physiological responses of tropical fruits, mainly those found in Jamaica, are not documented; knowledge of their physiological parameters would be helpful for post-harvest technologies, thus ensuring good and long preservation of the shelf-life of the produce.
Tropical Crops
The values for physiological parameters of many Jamaican fruits as well as for many other tropical fruits and vegetables, including respiration rate (RR), ethylene production, fermentative index (FI), the Q10, Vm and apparent Km (app Km) (Menten-Michaelis equation) and their variations with storage times and conditions, and environmental stresses constitute the basic knowledge for the post-harvest handling and management of crops. Without these data, it would not be possible to design, handle and store the fresh produce adequately and assure its conservation, because it is highly perishable. Jamaica, like other tropical regions, has potential for agricultural produce and many fruits are found. However, these fruits are grown as “wild” and no data on their physiological and biochemical parameters seem readily available in the current literature, either in or outside the island. A few referenced papers reported on the hypoglycine and lipids of Ackee, and the storage of Carambola (starfruit) under various temperature conditions; apart from these, there is a dearth of studies on these fruits, while none investigated the physiological parameters cited above.

Post-harvest Technologies for Preservation of Tropical Crops
The development of storage technologies and their application require knowledge and determination of physiological parameters i.e. respiration, anoxia and effects of gas composition, to predict gas exchanges of tissues and the behaviour of the commodities during storage, and to match their packaging films or controlled atmosphere respiratory requirements. This knowledge will help to improve storage and to extend the post-harvest life of the commodities. The application of adequate techniques to extend the shelf-life of the fresh produce will also lead to the preservation of their quality attributes - mainly their biochemical and nutritional qualities. Producing much is good, preserving what is harvested is better, since the losses in the developing countries reach 40% due mainly to inappropriate handling and ignorance of the post-harvest behaviour of the fresh products. Modified Atmosphere (MA) combined with refrigeration, and other chemical treatments such as essential oils chlorination, ethanol vapour, (EOs), hot water, jasmonate…etc, will be experimented to develop appropriate methods of shelf-life extension of tropical crops.

Research Outcomes
The results would not only fill the gap in this field, but also provide the basic information for regional (Tropics) technologists to develop appropriate handling and storage conditions for such produce. Moreover, the knowledge of the physiological parameters and the biochemical variation of fruits during post-harvest life will make more easy the development of agricultural practices; improve post-harvest handling, thus ensuring better shelf-life, preserving the nutritional attributes of the fruits, reducing losses and achieving quality marketing. Because fruits and vegetables are nutritious foods, considered to have major health benefits, they also contribute greatly to the economical life of rural populations. The final goal is to achieve the best agricultural and post-harvest practices and improve the economical situation of the farmers.

To date, this work has been the subject of five international presentations (Lisbon and Jamaica), one chapter of a book on Ackee (in press) and two submitted papers.

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The Most Outstanding Research Activity
“Studies on Two Alien Invasive Pests of Citrus spp. and the Development of Control Measures against Them”

There are several pests of the citrus industry in Jamaica. Among these are presently two invasive species of butterflies, one of which - native to Cuba - migrated here and was first observed in the island in 1945. How it reached our shores is still not known but as is sometimes the case when new species arrive and do not have the natural enemies found in their native habitats, this butterfly has become the predominant citrus feeding Swallowtail butterfly on the island. While this butterfly, *Heraclides andraemon*, has firmly established itself, the two beautiful endemic Citrus Swallowtail butterflies that are native here and found only in Jamaica - *Heraclides thersites* and *Heraclides melonius* - have become scarce, and the latter is believed to be threatened to the point of extinction.

*Heraclides andraemon* feeds on the young leaves of all the species of citrus grown on the island, and has the potential to destroy seedlings by consuming all their leaves. Larger trees can withstand their feeding but the yield of fruits from trees with extensive feeding by the butterfly will be affected.

The Development of a Control Method against *Heraclides andraemon*

A breakthrough in the development of a method of control of the first invasive pest occurred in 2001, when it was observed laying on a different, previously un-investigated host plant. An intensive study of the feeding of the butterfly on this new host plant and its laying behaviour, led to the discovery of the critical chemical which determines the host plant on which the butterfly lays its eggs. By using the chemical when the butterflies are ready to lay, it was found that they could be manipulated to lay more than 90% of their eggs on a desired host, and to limit their laying on any of the citrus seedlings freely provided, to less than 5%.

Repeated experiments confirmed this level of control over their laying pattern and that it therefore was possible to alter their natural tendency to lay on citrus. Moreover, and very significantly, the butterflies maintained this altered laying behaviour into the next generation.
The Importance of the Discovery

The citrus industry is very important to the countries in this region. In Jamaica, the industry was valued at approximately US$21 million in 2003/2004, and employed some 25,000 persons. In the Dominican Republic, the crop was valued at approximately US$30 million, and some 3,000-4,000 families depended on the industry for their livelihood. In the USA, the value of the crop in Florida was determined as exceeding US$1.5 billion in 2002, and that of the total USA, which would include the crops in Florida, Arizona, California and Texas, was worth approx. US$2.6 billion in 2004.

Information obtained locally revealed that one of the major citrus companies spent about J$2 million annually in its control of this pest. It may be possible for the researchers to market their technology to the neighbouring countries of the region where Heraclides andraemon occurs. The cost of the plant extracts used in the methodology are less expensive than synthetic pesticides and there are a number of ecological advantages to this method. Firstly, being plant extracts, the chemicals used are not expected to remain in the environment for a long period of time but would be subject to chemical degradation much more easily than the synthetic pesticides. Secondly, it is more likely that the plant extracts would be specific in their mode of action and the other insects, such as beneficial ones, may not be affected. Further experiments would have to be done to confirm this. Thirdly, since this methodology uses the natural chemical that the butterfly uses in its laying behaviour, it is unlikely that they would develop a resistance to the method.

The Arrival of a Second Alien Invasive Swallowtail Butterfly

During the period of these investigations into the feeding and laying behaviour, and later control, of Heraclides andraemon, it was reported that a distantly related species from the Far East was observed for the first time in the western hemisphere, in the Dominican Republic in 2004. By 2005 the butterfly was reported in Puerto Rico, and by 2006 in Jamaica. This was the invasive pest Papilio demoleus L. (Lepidoptera: Papilionidae). This butterfly has the reputation of being a pest able to colonize vast new areas and to be devastating to local citrus crops. It has been spreading across the island and was first observed on the UWI, Mona Campus in 2007, and has since become the most prevalent Citrus Swallowtail butterfly on the citrus trees on campus.

The Development of a Control Measure against Papilio demoleus

With the arrival of this new alien invasive pest, it was decided to test the same methodology. It was found that the critically important chemical in influencing Heraclides andraemon’s choice of host plant on which it would lay, was similarly important in this newly arriving species. In one of the first experiments, it was found possible to manipulate the laying of this species so that more than two-thirds of its eggs were laid on a non-host plant by inducement and less than a third of its eggs on the citrus plants that were
freely provided at the time of their laying. There was also the desirable
effect that all the eggs that were laid
on these non-host plants, hatched into
larvae that could not survive on the
non-host plants and died soon after.

Further research into the mode of
action as poisons, of some of the
constituents of the plant extracts used
has led to the development of extracts
that kill more than 95% of the larvae
of both species. In addition, further
research has also led to extracts that
show significant repellant effects, and
could be added to the arsenal for the
control of these pests.

Additional Considerations of
the Importance of Methods of
Control
In addition to the USA, Brazil is a
world leading citrus producer. The
newly arriving *Papilio demoleus*
has not yet been observed in either
of these two countries. It is quite
possible that if it is observed in
either of these major citrus producing
countries, the UWI methodology may
become very marketable there. It is
also a significant advantage to have
developed a control method so early,
when the pest would not yet have
established itself, and the control
measures described above are likely
to be extremely effective.

Other Considerations
The two endemic species of Citrus
Swallowtails of Jamaica that have
been severely threatened, especially
with the arrival of *Heraclides andraemon*, are quite beautiful in
appearance. The arrival of a second
invasive species is likely to result in
their further demise.

Of the series, only one of the Jamaican
endemics, *Heraclides thersites*,
have males and females which have
different appearance. *Heraclides
thersites* is a relatively large butterfly,
62 mm. in width as compared to
*Heraclides andraemon*, which is 45
mm. in width.

The endemic Jamaican Citrus Swallowtail that is extremely rare and be-
lieved possibly at the point of extinction is *Heraclides melonius*.

With the control of the two alien invasives, it may become possible to see
more of the local endemics once again.

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The Research Project Attracting The Most Research Funds

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This project grew from a 2007 MacArthur Foundation grant that focused on the conservation of the Black River Lower Morass (BRLM) and the Cockpit Country. A renewal grant from MacArthur, together with a recent award from the Forest Conservation Fund, is allowing the investigators to expand that research and also conduct analyses of two other important natural areas – the John Crow Mountains and the Hellshire Hills. The overall goals of the project are to assess the current status of the island’s most important remaining forested habitats, understand past patterns of anthropogenic disturbance, and make recommendations for conserving the biodiversity within and the ecosystem services provided by these critical natural areas.

Importance of the Cockpit Country and the Black River Lower Morass

The Black River Lower Morass (BRLM) and the Cockpit Country are reservoirs of endemic diversity and provide essential ecosystem services to a large part of Jamaica. The Cockpit Country is the largest tropical moist forest over limestone in the Caribbean, and therefore plays an essential role in carbon sequestration; in addition, Cockpit Country provides water for 40% of the Island, and its tributaries feed other important sites, such as the BRLM. Thus, the conservation of these areas is important for combating the impact of global climate change, maintaining biodiversity, and providing essential services to the communities that depend upon them.

Environmental Problems in the Black River Morass

The BRLM is the largest freshwater wetland in the Caribbean. However, it has lost approximately 80% of its original (natural) habitat, and the remnant patches of swamp forest are now threatened with imminent extinction. These remaining patches constitute the only Amazonian type swamp forest habitat in Jamaica, and therefore are considered to be the most critically endangered habitat type on the island, and probably in the Caribbean generally. Conservation of the swamp forest is challenged by on-going human impacts (e.g., tree cutting, fires) and is compounded by the establishment of two exotic plant species that are at different stages of invasion. The aquatic component of the morass is dominated by six invasive fish species and an invasive crayfish species (the ‘Alien’). Thus the BRLM represents a “novel ecosystem” that should be managed to:

1) conserve the few remaining intact habitats, such as the unique but critically endangered patches of swamp forest,
2) maintain the integrity of the peatland so that it can continue to act as a long-term sink for carbon dioxide, and
3) provide other ecosystem services, such as safe fresh water, and nursery habitat for economically important species such as shrimp and commercially valuable fish.
Global Climate Change and the Jamaican Environment

Another immediate consideration is global climate change. The maintenance of forest cover and biodiversity is the most effective means of combating the effects of climate change. Yet in Jamaica, scant attention has been directed at the maintenance of forest cover. Habitat assessments have been few, and for three of the four target sites, the most recent habitat assessments were conducted 12-40 years ago. This is because habitat assessments are time-consuming and expensive. With a recommended return time of every 5 years for surveys, the Forestry Department lacks the resources and manpower to effectively monitor our forested environments. Therefore, we do not know the current status of any of our native tree species or their habitats.

Additionally, large areas of the BRLM are at or below sea level, and the impact of sea level rise on the vegetation and the surrounding human communities has never been investigated. Moreover, a habitat management plan has not yet been drafted for the BRLM. In addition, recent ecological and landscape level data (within the last 10 years) were not incorporated in the most recent habitat management plan for the Cockpit Country, nor were ecosystem services data available to those analyses. Hence, a significant constraint faced by management organisations is the lack of up-to-date biological/ecological and ecosystem services information.

Climate Change will Affect the Services Humans Extract from the Environment

While the current project has clarified the extent to which habitats in the Cockpit Country and the BRLM are being lost or degraded, other critical information is unavailable. For example, only scant quantitative information on ecosystem services is available for either of these sites. Not surprisingly, neither site has been subjected to an ecosystem valuation, nor have the impacts of habitat degradation and global climate change on ecosystem services been assessed.
Research Focus
Therefore, the main thrust of the proposed work is to build on current initiatives by continuing the assessments of the Black River Lower Morass, Cockpit Country, Hellshire Hills and John Crow Mountains at the landscape and local levels, and by quantifying and valuating the services provided by these ecosystems. A major component of this effort is the provision of training for Jamaicans (and individuals from the wider Caribbean) in the use of traditional and emerging technologies for collecting data at the landscape and local levels, and in the valuation of ecosystem services. The research team also plans to develop a decision support system (DSS) that will incorporate diverse data and provide a valuable tool for managers and conservation practitioners seeking to assess the possible outcomes of various future scenarios.

Preventing Extinctions of Jamaican Plants and Animals
The overarching objectives are simple: prevent extinctions, maximize the quality and sustainability of ecosystem services, and mitigate the impacts of climate change, especially sea level rise. Humans depend on the same environment as the native species; if these are threatened, all are threatened. And Jamaica’s native and endemic species are most assuredly in trouble. The researchers hope to conduct research that will help inform future efforts to safeguard what is left of the country’s natural resources.

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Mona Webber

The Research Project With the Greatest Business/Economic/Development Impact
“The Mangrove Ecosystem: A Biodiversity Hot-Spot”

Mangrove areas provide habitat and food for numerous marine and land dwelling species of plants and animals. These areas, commonly called swamps, are also vital in stabilizing land and protecting our coastal areas from storm surges caused by hurricanes. The Environmental Foundation of Jamaica funded project titled “The Mangrove Ecosystem: A Biodiversity Hot-Spot” had as its overall objective, contribution to the conservation and preservation of mangrove ecosystems through research and public education about the importance of mangrove areas.

Exposing the Public

The project aimed to achieve this by exposing the public to the rich biodiversity and ecological value of Jamaica’s mangroves through displays which highlighted and presented biodiversity information in a format that was readily understood by the public (students, teachers, naturalists). The project drew on work already done. on ascidians by Ivan Goodbody, bryozoans by Marcia Creary, sponges by Celia Jackson and zooplankton by Mona Webber. New research was generated on algae by Krystal Karjohn and general fauna by Rachel Pal, Tamia Harker, Tovia Elliott and Sacha Todd.

The goal of documentation of the biodiversity and its presentation in an easily understood format was realised by the production of poster displays (Plate 1) and a seven volume field guide introducing the mangrove system and its main groups of organisms. The field guide is used by persons touring the Port Royal mangroves and was also produced as an interactive CD-Rom, which has been distributed to over 100 schools across Jamaica. The seven-volume field guide is available as a d-space document and has the distinction of achieving the greatest readership (323 ‘hits’) of the UWI d-space at Mona documents. The mangrove species included in the seven-volume guide are presented as aquarium displays and held in reference collections at the Port Royal Marine Lab for visitors and researchers to see and use in reference to the animals seen while on tour of the mangroves.

UWI graduate and undergraduate students have been trained in the identification of, and in the methods relating to, the study of particular species. Their type-specimens and samples are available to other researchers for use as reference materials as they study the biodiversity.

The UWI Documents its Work

Eleven new UWI publications, theses and research project reports have been produced as a result of this project. However, the major achievement is that of public education and outreach. The Port Royal Marine Laboratory was in the past occasionally used by schools and colleges for the purpose
of taking students into the surrounding habitats. The demand for mangrove tours however has increased 10-fold. The project-generated posters and field guides complement the tours and provide very effective teaching tools. Annual number of visitors exceed 1000, with peak periods being January to May (558 visitors) and September to December (464 visitors). Visitors come from institutions such as teachers’ colleges (Shortwood, Mico, CASE); primary schools (Alpha, Franklin Town, New Providence); high schools (Godfrey Stewart, Queens, Camperdown, Oberlin, Wolmers Girls, Kingston Technical); preparatory schools (St Jago, Mona; Hillel); and from Northern Caribbean University, Portmore Community College, Villa Road Primary & Junior High, Peter’s Rock Christian School.

The live display of mangrove lagoon communities mounted at the Port Royal Marine Laboratory in aquaria to complement the field guides was the genesis of the newly established University of the West Indies, Environmental Foundation of Jamaica, Port Royal Marine Laboratory, Biodiversity Centre opened in January 2010.

Permanent Outreach Facility
Thus the Mangrove Biodiversity Hot-Spots project has led to the development of a permanent outreach facility to display, not just mangrove biodiversity, but the diversity associated with the range of habitats in the Palisadoes and Port Royal protected area. The UWI/EFJ/PRML Biodiversity Centre houses wet and dry displays of mangrove habitats and organisms along with seagrass and coral reefs. This shows the inter-relatedness of these coastal systems. The indoor display has interactive zones and aquarium exhibits and is complemented by an outdoor facility which includes the typical dry-limestone cactus and sand dune coastal habitats transmitting into a mangrove tree/forest habitat with flowing water connected by a boardwalk. The Biodiversity Centre is designed to accommodate visitors to the Port Royal Marine Laboratory, and permanently houses and presents, in an attractive manner, the biodiversity associated with mangroves as well as other habitats.

The development of the UWI/EFJ Biodiversity Centre has become the focal point for the environmental education thrust of the Port Royal Marine Lab and the Department of Life Sciences as we respond to the University’s mandate of serving Jamaica and the Caribbean in the areas of wise use of the environment, environmental management and education. In addition to being a teaching resource, the Biodiversity Centre has the potential to become an eco-tourism destination in the Port Royal area.

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FACULTY OF

MEDICAL SCIENCES
Leslie Gabay | Minerva Thame | Michael Boyne | Marvin Reid

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The Best Research Publication: Articles

AND COLLABORATORS
“Growth, Body Composition and the Onset of Puberty: Longitudinal Observations in Afro-Caribbean Children”

What is Puberty?
Puberty is the period during which a child’s body becomes an adult body capable of sexual reproduction. It involves a series of physical changes that lead to the maturing of genital organs and the development of secondary sex characteristics (which are the physical features associated with adults, e.g. pubic hair).

Secular Trends in Puberty
Worldwide, the age of onset of puberty has decreased. In girls, the age of the onset of menses (i.e. menarche) declined in North America and Europe from age 17 years in the mid-19th century to about 14 years in the mid-20th century. Similar trends also occurred in the age of onset of breast and pubic hair development. There are sparse data on puberty in boys, but the age of onset may also be declining. The cause of this trend is not clear, but it could be due to improved nutrition, increased socio-economic status and increased fatness in children.

Puberty in Caribbean Children
There are few data on puberty in Afro-Caribbean children. The only data available suggest that the age of onset of menarche has decreased from 14-16 years in the 19th century to 13 years in the 1970s. At the same time, the prevalence of overweight and obesity in Caribbean children is high and may be increasing. Much of the increase in obesity rates in developing countries has been attributed to increased consumption of high-calorie processed foods. Thus, it is possible that these dietary changes and increasing fatness in Caribbean children could contribute to an earlier onset in puberty. However, it is not clear what specific growth patterns could influence puberty. Possible patterns include growth restriction during foetal life and rapid growth in childhood.

Examining Puberty and its Determinants in Jamaican Children
We hypothesized that in a population from a developing country such as Jamaica, where obesity rates are increasing, faster childhood growth rates would be associated with more advanced puberty. We therefore examined the effects of birth size, and growth rates during infancy and childhood on the stage of puberty in 259 healthy Jamaican children from the Vulnerable Windows Cohort Study.

The Vulnerable Windows Cohort Study is a longitudinal observational study which was established in 1992 at the TMRI to determine the relationship of maternal size and foetal/childhood growth on the risk of cardiovascular risk factors. The children’s anthropometry (i.e. weight, height, skinfold measurements, waist circumference) was measured at birth, at 6 weeks, 3 monthly to 2 years and then every 6 months. Body fat was also measured at age 11 years using a bioelectrical impedance machine. Puberty was measured on a 6-monthly basis starting at about age 8 years. That is, pubic hair growth and breast development was assessed using a standardized protocol. Testicular size was measured with an orchidometer.
We assessed socioeconomic status and the menstrual history of the girls with a questionnaire.

**What Researchers Found**

At age 11 years, 36% of girls and 26% of boys were overweight, while 14% of girls and 10% of boys were obese. In the girls, breast development (i.e. thelarche), pubic hair development (i.e. pubarche) and menarche occurred at approximately ages 9, 10 and 12 years respectively. By age 8 years, about a third of girls started to develop breasts and 12% started developing pubic hair.

Pubarche in boys occurred at age 11 years when the testicular volume was about 3 millilitres. Birth size was associated with testicular size, but not pubarche, thelarche or menarche. Children who grew faster during infancy and childhood had more advanced pubarche. Faster growth was not associated with menarche.

Children with more fat at age 8 years were more likely to have advanced puberty at age 11 years. Lean mass at age 11 years, but not fat mass, was associated with more advanced puberty. Girls of higher socioeconomic status had earlier pubarche and menarche. However, socioeconomic status had no impact on puberty in boys. Boys, but not girls, who had more advanced puberty had larger waist circumference.

**The Implications of the Findings**

Previously there were little data on puberty for clinicians to use when evaluating Caribbean children. This longitudinal study provides normative data on the onset of puberty in Afro-Caribbean children. Faster growth during infancy and childhood is associated with more advanced puberty apart from menarche. It is not clear how faster growth can influence the timing of puberty, but several hormones (such as IGF-I and leptin) have been implicated. Body composition may provide a clue, although its role in the timing of puberty is controversial. Some investigators have reported that critical levels of body fat are required to initiate puberty in girls. Our data support this “critical fat hypothesis,” but for both sexes. So, children who have more fat at an earlier age have an earlier onset of puberty. Once puberty starts, the amount of lean mass then increases significantly. The increase in waist circumference in boys may convey more cardiovascular risk in later life.

In summary, these findings support the hypothesis that faster growth throughout childhood is associated with earlier sexual maturation. These data will have increasing importance if the obesity epidemic continues to affect Jamaican children.

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The Best Research Publication: Articles
"Retained Placenta in Homozygous Sickle Cell Disease"

The Placenta
The placenta is an organ that connects the developing foetus to the womb, allowing nutrients and oxygen to pass to the foetus, and waste from the foetus to be eliminated via the mother’s blood supply. When the baby is born this organ separates from the uterine wall and is expelled from the womb. The period of time between the birth and this expulsion is known as the third stage of labour and usually takes between 5-15 minutes.

Retained Placenta
If the placenta remains within the womb for 30 minutes or more, this is referred to as a retained placenta. This can have serious complications for the mother, including severe bleeding which may be life threatening. A retained placenta is known to be more common in women who have had many babies, have had previous infections of the womb, induced or preterm labour, a small placenta, previous surgery involving the womb, and the use of drugs, like oxytocin, which enhance labour.

Sickle Cell Disease
This is a common genetic condition resulting from the inheritance of abnormal haemoglobin genes from both parents. It is associated with abnormal red cells which are quickly destroyed in the circulation and which may block blood flow, causing damage to the tissue supplied. Complications of the disease include
anaemia, jaundice (yellowing of the whites of the eyes), severe pains in the bones close to the joints (painful crisis), serious chest problems and stroke.

**Pregnancy and Sickle Cell Disease**

The disease may also affect pregnancy and women with SS disease (the more severe form where the sickle cell gene is inherited from both parents) are more likely to lose the baby at every stage of pregnancy (one-third end in spontaneous abortions) and to have babies with low birth weights. Other complications in pregnancy also include an increased risk of urinary tract infections and increased painful crises and acute chest syndrome, especially in the last three months and immediately after delivery. The risk of death in mothers with SS disease associated with pregnancy is 100 times greater than in the normal population. It is clear therefore that pregnancy in mothers with SS disease holds risks for the mother and for the developing foetus. The extent of these risks has been further documented by the current study which shows that a significant increase in retained placenta also occurs in these mothers.

**An Important New Finding**

Much has been learnt about sickle cell disease in Jamaica from the Jamaican Sickle Cell Cohort Study which is based on the close follow-up of all cases of sickle cell disease diagnosed among 100,000 consecutive non-operative deliveries at Victoria Jubilee Hospital screened between 1973 and 1981. These persons are now aged up to 37 years and their response and performance in pregnancy has been closely documented. Review of this experience indicated that a retained placenta was much more common among SS mothers than among the normal mothers also followed as controls in the study. However, the significance of this finding was limited by relatively small numbers, because only 52 SS patients were available. This study has now been expanded to include 174 mothers with SS disease who were delivered at the University Hospital between 1992 and 2005. The results are conclusive in showing that 18% of SS mothers have a retained placenta compared with 3% in the normal mothers. Further analysis showed that the only clear factor related to a retained placenta was the presence of SS disease in the mother.

**Another Potential Danger of Pregnancy in Sickle Cell Disease**

This finding should alert obstetricians to another potential danger for women with SS disease and their doctors should closely monitor the third stage of pregnancy in their care of women with SS disease.

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THE BEST RESEARCH PUBLICATION:
ARTICLES

72
Teenage Pregnancy
Teenage pregnancies are associated with a high prevalence of low birth-weight and of premature infants. The premature babies have many problems, which may affect their survival. The teenagers are still growing and it is possible that they cannot supply sufficient nutrients to support both their own growth and that of the foetus. The adult woman has completed her growth and hence she is not faced with that problem.

An Important Question
One question we were interested in asking was whether the pregnant teenage girls were capable of providing sufficient glucose to meet the need to ensure optimal growth of the foetus. This glucose production is important, because, unlike the mature human, the foetus can only use glucose and amino acids as the source of energy for growth. So the pregnant mother has to increase the amount of glucose that she is producing, especially when she is not eating, like during an overnight fast.

Important Nutrients
The pregnant mother has to make a sufficient amount of glucose not only for herself, but for the growing foetus. Adult women are able to do this by increasing the amount of glucose that they produce from a process called gluconeogenesis. This glucose is made when the protein they eat breaks down to form amino acids during brief periods of fasting. It is thought that during pregnancy there is an increase in the rate at which women break down protein to form amino acids to supply nutrients for the foetus. The taller and heavier the women are the more protein they are able to break down; hence a greater supply of nutrients for the foetus. However, some pregnant teenage girls are small in size and do not have as much body protein to break down to produce the necessary requirements to make new glucose.

Importance of Weight Gain
We as well as others have reported that pregnant teenagers gain more weight than do their adult counterparts during pregnancy. We have also shown that most of this weight gain was in lean body mass, suggesting that pregnant teenagers may require more amino acids than adult women to support the increased protein synthesis associated with their own growth plus the growth of their reproductive tissues and the foetus. Hence, as pregnancy progresses, unlike their adult counterparts, pregnant teenagers may not have sufficient building blocks to support increased gluconeogenesis.
Comparison of Adults and Teenagers
This study aimed to find out whether teenage girls between 13 and 17 years were able to increase the amount of glucose they produce after a brief period of fasting, to the same extent as the adult women. Because foetal energy demands are met exclusively from oxidation of glucose and amino acids, it is possible that the growing teenage girls give birth to a smaller baby because they cannot provide the extra glucose and amino acids needed for optimal foetal growth.

In the study the amount of glucose the adult women produced was measured and compared to the amount of glucose the teenage girls produced. These measurements occurred in early pregnancy at approximately 12 to 13 weeks of pregnancy and again later in pregnancy at approximately 27 to 28 weeks.

Pioneer Research
It was found that both the adult women and the teenage girls increased the amount of glucose they produced, but the adult women made more. The adult women increased the amount of glucose produced by increasing gluconeogenesis, suggesting that they had a sufficient supply of amino acids to maintain the increase in newly synthesized glucose. In contrast, the teenage girls did not make new glucose through gluconeogenesis, and the amount of glucose fell after an overnight fast. Instead, they produced their glucose by breaking down glycogen stored in the liver, a process called glycogenolysis. It would appear as if the teenage girls did not have sufficient amino acids to make new glucose, so they made new glucose in the short-term by breaking down glycogen. The liver has only a limited amount of glycogen, which can be used up completely after several days of fasting. This has several implications for teenage girls in developing countries, especially where famine occurs or where there are high rates of food insecurity.
Importance Of This Study
These findings imply that pregnant teenagers should not go for long periods of time without eating. Pregnant teenage girls who are exposed to long periods of fasting due probably to the unavailability of food put themselves and their foetuses at risk. Teenagers should take extra precautions to be sure they are eating sufficiently during pregnancy.

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The Most Outstanding Researcher
“Healthy Mother, Healthy Baby”

It is well known that the nutritional state of a woman prior to and during pregnancy affects the nutrition and growth of her baby in the womb. This is important as she has to supply nutrients to her baby in the correct quantity and by the correct method. This varies throughout pregnancy, as the demands of the baby in the womb change as pregnancy progresses.

**Two Important Nutrients for Growth of a Baby Inside the Womb**

The pregnant mother has to supply the growing baby inside her with enough glucose (sugar) and building blocks of proteins (amino acids) for adequate growth. To meet the increased need for glucose, the pregnant woman uses some basic building blocks of proteins (amino acids) and converts them to the needed glucose. Therefore as pregnancy progresses the need for glucose and amino acids increases to supply baby’s demands for growth. After a brief period of not eating, the level of amino acids in the blood of the pregnant woman is significantly lowered and this suggests that there is a close relationship between the supply of amino acids by the mother and the demand for these nutrients by the growing baby. This seems to be even more so for the amino acids needed to produce glucose.

**Nutritional Challenges of Teenage Mothers**

A teenage mother has an added burden: she must supply enough nutrients for the growth of the baby inside her as well as for her own growth, as she, unlike an adult mother, is still growing. She therefore requires a greater supply of amino acids to support her own growth as well as the growth of her baby; hence as pregnancy progresses, she may not have sufficient building blocks to support increased glucose production.

**Question Asked**

These studies aimed to ask the question whether pregnant teenage girls would be able to increase the conversion of amino acids to glucose to the same extent as the pregnant adult women. We also explored whether the pregnant teenage girl as she progressed in her pregnancy would be able to meet the energy needs of her baby. Additionally, glycine, an important amino acid, may not be produced at the required rate in the latter half of pregnancy. We believe all these would result in the teenage mother giving birth to a smaller baby than her adult counterpart because she cannot keep up with the increasing demand for glucose and glycine as pregnancy progresses. To test this, the rate of glucose and glycine production was measured in pregnant adult women and in teenage girls in the early and the later stage of pregnancy.

**Teenage Mothers Meet the Energy Demand of the Growing Baby Differently from Adult Mothers**

Both the adult women and the teenage girls increased their glucose production from early to late pregnancy, but the adult women...
produced more glucose than the teenage girls. The method by which the adult women produced their glucose was via converting amino acids to glucose, indicating that they had more amino acids available to do this. The teenage girls, although they had an increase in glucose production, also had a fall in the rate at which they converted amino acids to glucose. They however increased their glucose by breaking down glycogen stores in the liver to produce new glucose. This suggests that the teenage girls did not have enough amino acids available to use for production of glucose. This was further supported by the finding that glycine levels decreased in the teenage mothers between early and late pregnancy, whereas the levels increased in the adult women.

**High Risk Groups and Pregnancy**

**Pregnancies in Women with Homozygous Sickle Cell Disease**
The underlying health of the mother can affect the growth of her baby; an increased metabolic demand from an illness in the mother can affect the well-being of the baby inside her. Compared with controls, women with sickle cell disease had had later onset of their menstrual period, had been older at the start of their first pregnancy and experienced more spontaneous losses. Babies of women with sickle cell disease had a lower gestational age and lower birth weight. A new and an important finding has been that women with sickle cell disease had significantly more retained placentas than women without SS disease. This may lead to more bleeding after delivery and hence another potentially dangerous complication for the women with sickle cell disease.

**Teenage Pregnancy**
Teenage pregnancy still remains a major health concern worldwide. It is associated with a high prevalence of low birth weight infants and premature births which will affect the rates of the number of babies that will survive after birth.

**Body Composition in Pregnancies of Adolescents and Mature Women**
Teenage girls have significantly lower maternal size and body composition in early pregnancy compared to adult women. These differences are seen throughout the entire pregnancy. However, with good antenatal care, the
teenage girls were able to gain more weight and lean body mass in their pregnancy, which had a positive effect on the newborn’s measurements.

**Weight Retention after Pregnancy in the Teenagers**
Teenage girls were found to retain more weight after their pregnancy, compared to the older women; and the weight which they retained was mainly fat. These findings suggest that teenage girls may be at greater risk for the development of obesity in later life.

**Importance of these Studies**
This work will facilitate a greater understanding of the close link between nutrition, the health of the mother and the health of the baby in high risk groups, and will allow for targeted interventions which will improve the chances of a mother delivering a healthy baby.

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Rainford Wilks

The Most Outstanding Researcher
“HEART DISEASE AND DIABETES MELLITUS RESEARCH IN JAMAICA”

Heart disease is a major cause of illness and death in Jamaica, the Caribbean and developing countries worldwide. There is a need to better understand the extent of the problem and the factors which increase risk.

Genes: Identifying Ancestry and Markers of Heart Disease Risk
Working with Colin McKenzie and colleagues in the Tropical Metabolism Research Unit (TMRU) and with collaborators from several USA and Canadian Universities, we pooled our data from epidemiology studies done in Spanish Town over the last 17 years, with data from several other sites across the world to examine:
• The mixture of the ancestry in populations of uncertain origin by examining their genes
• The association between genetic markers and nutritional status, particularly obesity and fat mass, in African- and African-derived populations.

Using the most current molecular biology techniques, and pooling data from several ethnic groups, the research team was able to eliminate poorly performing markers, derive estimates of levels of admixture in populations and identify markers which provided information about the ancestry of peoples. We were also able to use these techniques to differentiate closely related populations. In addition, our Jamaican data from Spanish Town have been able to contribute to earliest investigations of genetic studies to identify traits and diseases in African-derived populations. So far we have not been able to confirm or refute the associations seen in European-derived populations, but several markers - in particular those related to height and body mass index (BMI), previously confirmed in European populations - have shown some similarities in our African-derived sample. These studies demonstrate the importance of research to the basic understanding of diseases of public health importance in Jamaica.

Markers of Heart Disease Risk in Jamaica: The “Metabolic Syndrome” and Obesity
In studies using data from our Spanish Town community study (adults) and from youths born in 1986, the team was able to provide the first estimates of the frequency of the “metabolic syndrome” (a combination of elevated blood pressure, elevated blood glucose, central obesity and abnormal serum lipids), a recognized risk factor for heart disease, in Jamaica.

Among 1870 participants, age 25-74 years in the Spanish Town survey, we have shown that the “metabolic syndrome” is common, affecting one-fifth of adults, and is significantly more frequent among women. Increasing age among men and women as well as low education among men appeared to increase the risk of the “metabolic syndrome”. Among the
youths, 839 participants 18-20 years were studied, and while the “metabolic syndrome” was infrequent, some components, in particular central obesity (16%) and abnormal lipids (low HDL-cholesterol, 47%) were very frequent, putting this group at increased risk of heart disease. These data demonstrate the need to intervene in these populations, particularly in the young, if we are to reduce the epidemic of heart disease in our populations.

The research team conducted a national survey of over 1300 participants 15-19 years and showed that overweight is frequent in our population, affecting 21% of youths, and was associated with increased consumption of sweetened beverages. High waist circumference was present in 10%, was more frequent in females and was associated with low levels of fruit and vegetable consumption. This study strongly suggests that measures to reduce the consumption of sweetened beverages and increase fruit and vegetable intake can reduce the burden of excess body fat among adolescents.

Diabetes Mellitus and Heart Disease
In studies led by Marshall Tulloch-Reid on diabetes mellitus in youth we investigated how the current epidemic of obesity affects diabetes in youth. Hitherto, Type 2 diabetes mellitus was primarily a disease of adulthood. In a study of 58 youth with DM, 22% were found to have Type 2 diabetes mellitus and obesity was the strongest associated factor. These youth with Type 2 diabetes mellitus were more obese, had higher blood pressures and abnormal serum lipids which put them at higher risk for heart disease. This study confirms a pattern seen worldwide and strongly suggests that reducing obesity could lead to a reduction of Type 2 diabetes mellitus in youth and thus reduce the risk of heart disease in later life. In another study the team showed that heart disease was present in 60% of persons admitted to the University Hospital of the West Indies with diabetes mellitus during 2005. This confirms the strong association between diabetes mellitus and heart disease and suggests that the latter could be reduced with better control of diabetes mellitus.

Women Fail to Recall the Risk Associated with HTLV1 Infection
HTLV1 is a virus transmitted by sexual intercourse and from mothers to children primarily during breast feeding. Women can reduce the risk of HTLV1 transmission by their breast-feeding and sexual practices.

In collaboration with MPH student Carol Jones-Cooper and Public Health Epidemiologist Kenneth James of the Department of Community Health and Psychiatry, women who had been the subject of an intense intervention to reduce maternal-fetal transmission of HTLV1 in 1996-2000 were revisited to ascertain the extent of their retention of the advice given to them at that time. One hundred and fourteen of the original 194 women were located but only 80 agreed to be investigated. The study showed that just over a half recalled that HTLV1 was a sexually transmitted disease, less than a half recalled the diseases associated with HTLV1, while almost 90% continued to have unprotected sex. This suggests that women will need to have their health education reinforced at more frequent intervals if risky practices are to be avoided.

Professor Rainford Wilks & Clinical Epidemiology in the Caribbean
Under the direction of Professor Wilks, the research portfolio of the chronic disease research group in the Epidemiology Research Unit includes national surveys of youth and adults; cohort studies of youth and adults and the beginnings of some interventions to ameliorate childhood obesity in rural Jamaica. In the last 5 years Professor Wilks has attracted research funds amounting to approximately US$378,323.91 and J$45,759,141.00 and in the last year he has attracted grants totaling US$24,903.00 and J$1,481,000.

In the year under review Rainford Wilks co-authored eleven manuscripts and was senior author on 6 of these papers. Five of these manuscripts appeared in high impact international journals and five were published in the West Indian Medical Journal.

Professor Wilks leads a team of researchers which continues to inform the country, region and the world on the heart disease epidemic in developing countries. These data have been taken up by local and regional policy makers. In Jamaica, the Ministry of Health and the National Health Fund have used these data to develop policies and programmes to improve lifestyle and increase subsidies on medications for those already affected by the relevant diseases. Several islands in the region and researchers as far away as Pakistan have adopted the research instruments used in our surveys. More recently the ERU has been accepted into the International Clinical Epidemiology Network which bodes well for its international impact.

In the immediate future the ERU will strengthen and deepen collaborations in the region, develop more international collaborations and become more involved in testing interventions that can ameliorate the heart disease epidemic affecting developing countries.
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The Research Project Attracting the Most Research Funds
Jamaica’s Paediatric, Perinatal and Adolescent HIV/AIDS (JAPPAAIDS) Programme

A Collaboration between the University of the West Indies, Mona and The Ministry of Health in Jamaica

The Ministry of Health and the University of the West Indies have been working together successfully since September 2002 to prevent the passage of HIV (which causes AIDS) from mothers who carry the virus, to their unborn babies. The Ministry of Health and The University of the West Indies have also been working together to provide medicines, treatment and care for mothers and children and youth who have the HIV or AIDS in Kingston, St Andrew and St Catherine. Over five years, the successes have been a fall in the number of babies getting HIV from their mothers, from 30% to less than 2%. Furthermore, significantly fewer mothers, children and babies are getting sick, or dying from HIV infections and AIDS.

Because of these successes, the MOH requested the UWI to lead the management of Jamaica’s Programme for the Prevention, Treatment and Care of HIV/AIDS in Pregnant Women, Infants, Children and Young People through a two-year grant of J$58,352,335 M (about US$700,000) from the Global Fund for AIDS, TB and Malaria. This programme is called the Jamaica Perinatal, Paediatric and Adolescent HIV/AIDS Programme (JaPPAAIDS) and has been in effect since mid-2009 in several places in Jamaica, such as Victoria Jubilee Maternity Hospital, Comprehensive Health Centre, University Hospital, Spanish Town Hospital, Bustamante Hospital for Children, May Pen Hospital, Mandeville Regional Hospital, Black River Hospital, St Ann’s Bay Hospital, Sav-La-Mar Hospital and Cornwall Regional Hospital.

The treatment and care of the mothers and children (babies) is being provided by the general health staff at the island’s hospitals and clinics, assisted by the programme director as well as a specially hired and trained programme coordinator working with eight nurse managers, a psychologist, data manager, data entry clerk and an administrator. All of these persons are hired by the University, fully funded by the MOH/Global Fund, but are assigned to the UHWI and the many hospitals and/or clinics island-wide. This team continues to develop an island-wide database to gather important information from the patients and the programme to track the success of the programme interventions and outcomes for reporting and research purposes. Eight 1-2 day conferences have been hosted this year all over the island by the team, to train the regional healthcare teams.

Most important, this island-wide programme involves teaching, clinical patient care, operational research as well as community outreach and public service, which
are all in keeping with the UWI’s mission statement.

The programme has three main components, which concentrate on the women (perinatal), the children (paediatric) and the youth (adolescents), as follows.

The Jamaica Perinatal HIV/AIDS Programme includes revision of the national guidelines for preventing vertical transmission of HIV/AIDS; leadership and training of the healthcare team to prevent mother to child transmission of HIV/AIDS; island-wide roll out of a method for rapid recognition of HIV infection babies by the age of 4 months, which is supported by the Clinton Foundation; care and treatment of pregnant women - working closely with obstetricians and members of the healthcare teams in various hospitals and clinics; data collection, management and reporting to include demographic, obstetric, HIV-related interventions and outcomes data and monthly data reporting of expenditure and Perinatal HIV outcomes to the Ministry of Health (MOH).

The Jamaica Paediatric HIV/AIDS Programme includes revision of the national guidelines for the prevention, identification and management of babies who are born to HIV-infected mothers and also the HIV-infected infant and child; leadership and training of the healthcare team to prevent, treat and care for HIV-exposed and HIV-infected infants and children; patient management at various sites managed by nurses, in collaboration with paediatricians, social workers, pharmacists and other healthcare professionals; data collection, management and reporting to include demographic, clinical, paediatric, HIV-related interventions and outcomes data and monthly data reporting of expenditure and Paediatric HIV outcomes to MOH.
The Jamaica Adolescent HIV/AIDS Programme includes leadership and training of the healthcare team to prevent, treat and care for HIV-infected adolescents and youth; a weekly clinic at the University Hospital of the West Indies (UHWI) to care for HIV-infected Adolescents and Youth, aged 8 to 24 years – later to be expanded to Montego Bay/Cornwall Regional Hospital and other sites; development of a model for healthy lifestyles, HIV risk reduction and behaviour modification in adolescents with HIV and youth who are at risk for developing HIV/AIDS; adolescent HIV case management by nurses, in collaboration with paediatricians, psychologists, social workers, pharmacists and other healthcare professionals; data collection and management including demographic, clinical, HIV-related interventions and outcomes as well as pregnancy, disclosure, sexual history, condom use, contraceptives, sexually transmitted diseases, education, vocation; development of adolescents peer support groups and monthly data reporting of expenditure and Adolescent HIV outcomes to MOH.

Working together, the team hopes to accomplish its mission of stamping out HIV infection in children while making life better for mothers, children and families who are affected or infected by HIV/AIDS throughout the island of Jamaica.

Key members of the Jamaica Paediatric and Perinatal HIV/AIDS (JaPPAAIDS) Programme are as follows:

**Celia Christie-Samuels**, Professor of Paediatrics (Infectious Diseases, Epidemiology and Public Health) and Principal Investigator/Director of the Jamaica Paediatric, Perinatal and Adolescent HIV/AIDS (JaPPAAIDS) Programme.
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Social Sciences
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The Best Research Publication: Articles
“The Academic Economist as Public Teacher: Lessons from Lewis and the Caribbean Policy Discourse”

Academics as Public Teachers
Across the Caribbean, countries and the communities that make them up are beset by economic, social and political problems. In as far as academic economists and other social scientists conduct research on these problems, there is an expectation that they will produce ideas that can help to bring about solutions. The question is therefore posed: how can universities better ensure that the efforts of the academic economists have a more positive impact on the lives of the people who live in the communities which they serve? In other words, how can academics be better public teachers?

Assessing Lewis’s Academic Career
To address this question, Mark Figueroa has studied the career of W. Arthur Lewis, who is undoubtedly the most successful academic economist from the Caribbean. The surprising result is that despite Lewis’s work on diverse issues relating to economics, politics and society, spanning a half century starting in 1935, it is difficult to identify areas where his specific suggestions were integrated into policies actually implemented by Caribbean governments. This stands in contrast to the impact that he had on the two regional institutions which he led: the University of the West Indies (UWI) and the Caribbean Development Bank (CDB). It was Lewis who, for example, as Vice Chancellor guided UWI away from its original colonial conception as an elite residential college serving just 800 students.

Lewis’s Contribution to the Policy Discourse
The results of this study are published in “The Academic Economist as Teacher: Lessons from Lewis and the Caribbean Policy Discourse,” which appears in Social and Economic Studies, Volume 58, Numbers 3 and 4 (2009). Drawing on over 30 works produced by Lewis, much of the article discusses Lewis’s career and the ideas he had on what had held back the development of the Caribbean
and the measures that could be taken to advance its economy. Illustrations are given with respect to his views on industrialization, acquiring capital for the financing of Caribbean development, agricultural policy, the containment of production costs to ensure the competitiveness of Caribbean production and the importance of education of the mass of the people and of stimulating their participation in development. His views on regional economic and political integration are also highlighted, but space only allows a listing of his many other concerns with respect to social and political development.

Incentives and Structures for Knowledge Transfer
The time spent on the details of Lewis’s career and the ideas that he promoted help to refute some of the mistaken views regarding Lewis that suggest that he failed as a public teacher because his ideas were embodied in failed policies. Despite the length of these sections the main point of the article is presented in the shorter sections that deal with the lessons that can be derived from Lewis’s career. Academics do not have adequate incentives to focus on their role as public teachers and universities do not have the structures in place to facilitate the transfer of knowledge from those who develop it through their research to those who can use it, whether in policy formation or in improvement of their daily lives.

Balancing the University’s Role
Whereas it is important that universities retain their character as semi-autonomous institutions for the promotion of scholarship in which academics can pursue curiosity driven research, it is important that appropriate channels of communication are established with the communities which they serve. Some would have universities become the research arms of the state or commercial enterprises and believe that it is through this approach that relevant research will be produced. This is a very narrow view as it is not always possible to see the utility of research that is being undertaken at a particular time, and the unexpected application of the results of curiosity driven research has demonstrated its utility time and time again. What is required is that we strike the correct balance. Although many universities have made progress along these lines in recent years, much more needs to be done. The contrast between the quality of Lewis’s ideas and the extent of their impact demonstrates that universities need to do more to ensure that there are better means of getting the knowledge they develop to those who can make use of it.

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“ReThinking Caribbean Agriculture: Re-Evaluating Lewis’s Misunderstood Perspective”

Neglected Lessons on Agriculture
When Mark Figueroa discovered that the 40th Annual Monetary Studies Conference was to be held in St Kitts in 2008 under the theme “Economic Transformation in a Post Independence Caribbean: What Can We Learn from Sir Arthur Lewis?” he knew he had to attend, as his research over many years has shown that one of the main points that the Caribbean has not learned from Arthur Lewis was that a transformed agriculture was essential to the region’s economic development.

The conference was a double opportunity to make this point and get persons thinking more clearly about the importance of agriculture. The rapid increase in prices between 2006 and 2008 that saw many basic foods more than doubling in price was fresh in people’s minds. This should have made them receptive to a discussion on agricultural policy. In addition, the fact that the conference was dedicated to the insights from the Caribbean’s most successful economist, Arthur Lewis, should have made everyone willing to hear what he had to say on this important topic.

A Transformed Agriculture is Essential
Unfortunately, agriculture has been as much neglected in the Caribbean as have Lewis’s ideas on the topic. Many people have seen agriculture as a backward dying endeavour that should only be undertaken by those who cannot do better. Yet, if we stop to think about this, it is easy to see that nothing could be further from the truth. Agriculture is one of the most basic necessities, as without it there is no food to eat. So that the notion that agriculture would be replaced by more modern sectors in the economy is nonsense. There will always be a need for agricultural production. What is necessary is that we replace what is an old-fashioned agriculture that produces very little and affords farmers a low standard of living, with a cutting edge agriculture that is very productive and makes all of those who work in that field prosperous.
Sir William Arthur Lewis
Collected Papers 1941-1988 Volume III
The presentation at the 2008 conference led to the publication of the 2009 article “Rethinking Caribbean Agriculture: Re-evaluating Lewis’s Misunderstood Perspective” which appeared in the Journal of Business, Finance and Economics in Emerging Economies volume 4 number 2 (this is freely available on line). In the article, Lewis’s ideas on agriculture are traced from his earliest available writings in 1935 as a 20-year old student at the London School of Economics in England right up to his mature reflection on development written in the mid-1980s. In this way, the article demonstrates that at the core of Lewis’s ideas was the need to raise the productivity of domestic food production.

In the Caribbean, Lewis saw industrialization and the development of a productive service sector as essential. This was because alternative employment was needed for those in agriculture. There were too many persons on the land and land distribution was not the solution as there was simply not enough land available to support the agricultural population. So as long as farmers only had access to inadequate plots of land they could not earn a satisfactory income. His advocacy of industrialization as a means towards creating a productive agriculture was confused with a view that suggests that the solution was to get out of agriculture into industry. On the contrary, he felt that the agricultural and industrial revolutions needed to work together and feed on each other.

A Relevant Legacy of Agricultural Policy
There is much in Lewis’s legacy that is still relevant to contemporary Caribbean agriculture. First among these was his vision regarding the possibility of socially and technologically transformed agriculture providing satisfying livelihoods for its workers and relating in a productive way to other sectors such as tourism and agro-processing. To achieve this he proposed what he called a land reform package that embodied a range of measures. These included the provision of alternative employment for persons in agriculture; the consolidation of the land holdings of those who remained and the establishment of farms that were optimal for the kinds of crops in which they were engaged.
He made it clear that the solutions were not all technical and that the state would have to deal with the social issues that have caused detrimental power imbalances to persist in the sector. State action would remain essential in the areas of research, education and extension with a policy designed to meet the needs of the different sub-sectors and farm operators of different sizes and technological development. There is no suggestion that Lewis provides a readymade plan for action, but what this article demonstrates is that if we are to develop a multifaceted policy that can attract an adequate number of bright young people into the job of transforming agriculture, we need to do some serious rethinking along the lines that he proposed.

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“Export Initiation in Small, Locally Owned Firms from Emerging Economies: The Role of Personal Factors”

The small size of the home market in the Jamaican economy forces all firms to enter into international business if they are to grow and survive. International business activities, however, carry many risks and also require a large amount of resources. These resource requirements are generally beyond the reach of small firms, especially those that are independently owned and are not a part of a larger enterprise. However, these small firms generally find creative ways to overcome the limitations they face in resource constraints. The owners of these firms generally possess some important characteristics which form a source of competitive advantage for the firm. The aim of this research was to find out which characteristics are most crucial to help the small firm overcome their resource limitations and engage in international business through exporting, in order to ensure their survival.

What was Done?
The research started by conducting interviews with small, locally owned firms that are engaged in exporting and those that have the potential to export but are not doing so, in both the manufacturing and agricultural sectors of the Jamaican economy. Having interviewed these firms, the researcher then identified variables which captured the personal attributes of the owners of the firms. The data was then analyzed using the logistic regression model as the main tool.

What was Found?
The results from the study revealed that behavioural factors such as the owners’ foreign travel experience and the owners’ previous job experience are more important than demographic factors such as age and educational level of the owner.

Implications for Policy
The results can be used as a guide for public policymakers to design training programmes and educational centres to encourage specific entrepreneurial behaviour that is germane to export market entry. Training should be focused on shaping an international entrepreneurial orientation such as risk taking, pro-activeness and innovativeness. Inculcating these behaviours in the owners of small firms will see more of them engaging...
in international business through the exporting channel in order to ensure their survival and growth. With more small firms going this route, the implications for the local economy is tremendous, as it has the ability to reduce the mortality rate of small firms.

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EXPORT INITIATION IN SMALL, FAMILY-OWNED FIRMS FROM EMERGING ECONOMIES: THE ROLE OF PERSONAL FACTORS

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1. Introduction

In small, open economies, all firms have to compete within the international market if they are to become internationally competitive. The main source of the domestic market is where economic benefits flow from operational and international markets. This is critical for them to achieve economies of scale, reduce costs and compete effectively in international markets.

Therefore, if these firms are to succeed and grow, they will have to compete in the international market. This is particularly true in the rapid expansion of trade and the rapid expansion of international trade (Rosenbush, 2007; Mandl, 2007). Therefore, as globalization of markets continues, these small firms will seek to enter international markets.

Upon the rise of internationalization and integration, the need to integrate internationally, a more complex relationship between exporting firms and other exporting countries has developed. In the past, internationalization processes were more likely to be the result of a country's ability to internationalize.
“High Quality Research in Caribbean Thought”

Academic Caribbean Economists have now been writing for three-quarters of a century. The question is posed: what can we learn from a review of their work? In his continued work on Caribbean economics, Mark Figueroa demonstrates that there are significant lessons to be learnt. These are set out in two articles focusing on the St Lucian Economist, W Arthur Lewis: “Rethinking Caribbean Agriculture: Re-evaluating Lewis’s Misunderstood Perspective” and “The Academic Economist as Public Teacher: Lessons from Lewis and the Caribbean Policy Discourse”.

Correcting Erroneous Views about our Thinkers

In both of these articles there is an effort to correct false impressions that some later critics of Lewis have left regarding his work. In the first case, the impression that Lewis overlooked or undervalued agriculture; and in the second, that Lewis advocated specific policies (especially relating to industrialization) that led to the implementation of inappropriate policies by Caribbean governments. The correction of erroneous views about a leading Caribbean thinker that have gained widespread currency within the region has its own value. It is important for the self-esteem of our people that we do not undervalue the achievements of those who develop innovative ideas, as it is such ideas that are going to assist us in resolving our problems.
Yet pointing to the fact that erroneous views are prevalent has a greater significance. It cautions us to ensure that in dealing with contemporary ideas we take care to understand what is being said. Within the Caribbean policy discourse, differences are often generated; not so much by the presence of widely divergent views but more so by a predisposition to disagree. This often leads to a breakdown in communication and/or a failure to arrive at a consensus, as emphasis is placed on areas of disagreement even in situations where the actual balance is in favour of points of agreement. Frequently there is a failure to listen clearly to what is being said and/or to misrepresent the views of opponents; and the work of Lewis is a case in point.

Lessons for Agriculture
The first article reflects on the central role which agriculture (especially domestic food production) played in Lewis’s ideas, and considers the continued relevance of his policy perspective in this field. This article demonstrates that the five decades during which Lewis contemplated issues relating to agriculture were far from wasted. Given the continued concerns about the future stability of global food prices, a rethink of Caribbean agriculture is timely. What is unfortunate is that there are policies which Lewis advocated early in his career that are yet to be implemented in a thorough-going manner. An understanding as to why his suggestions were not adopted, and a new resolve to ensure that the same mistakes are not made again, are “take-away” lessons from this article.

Lessons for the Academy
The second article reflects on Lewis as an academic who saw his role as that of a public teacher. That is, someone who did not pursue the study of economics for its own sake but with a view to seeing how he could better educate his fellow citizens, including those responsible for the development of public policy. It suggests ways in which universities need to change both in terms of the incentives that they provide for academics to act as public teachers and of the structures that they provide for the transfer of knowledge generated by research, to those members of the community who can make use of this knowledge.

The Value of History
These articles once more demonstrate the value of the study of history, including the history of ideas, which is a maturing field within the Caribbean, where people have been considering their circumstances for centuries and Caribbean academics have been working for many decades. Mark Figueroa has concentrated much of his research focus within the area of Caribbean economic thought and continues to demonstrate the very practical lessons that can be learnt for the present from carefully crafted reflections on the past.

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Hopeton Dunn

The Research Project Attracting the Most Research Funds
Have you ever wondered how the cell phones, internet-based computing and new web applications are affecting or benefiting people in Jamaica and the wider Caribbean? Professor Hopeton Dunn and a team of researchers have been trying to find out over a two-year period. The Jamaica component is part of a larger regional research programme, funded by the International Development Research Centre (IDRC) of Canada.

Professor Dunn is conducting a major island-wide Internet user survey in Jamaica – the first of its kind in the region. The study, now in an advanced stage, will examine, among other things, how children, age ten years or older, use the Internet. This will help educators understand how to deploy online learning or homework assignments to youth. It will look at how older citizens use the Internet, whether for entertainment or for work, and how they finance their engagement with this technology. In contrast to the mobile phone penetration of over 100% of our population, it is felt that internet usage in Jamaica is relatively low. The last research investigation suggested that this level was below 30% of households. This large, unprecedented Internet household survey will tell us exactly how much progress the country has made in Internet penetration, given new mobile applications such as the fourth generation (4G) of mobile technologies offered by Digicel. It will also expose the difference in usage patterns between urban and rural citizens, as well as the needs and attitudes to the technologies by persons with disabilities.
The research design and questionnaire for the new Broadband survey were developed through an intensive process of international and regional collaboration with inputs from the International Telecommunications Union (ITU), the Observatory for the Information Society in Latin America and the Caribbean (OSILAC), the Caribbean Telecommunications Union (CTU) and the Department of Electrical and Computer Engineering, UWI, St. Augustine.

The Statistical Institute of Jamaica (STATIN) has been contracted to conduct the island-wide fieldwork aspects of the survey, to be completed by February 2011.

**Rethinking ICT Policy Making**

Another aspect of the research involves talking to people in groups and interviewing experts all over the Caribbean about how decisions are made when policies are to be developed. This multi-country regional study on the ICT policy-making process is being conducted with a view to improving delivery of more meaningful policy outcomes. Called Rethinking ICT Policy Making and Regulatory Processes in the Caribbean: Research on Improving Policy-making and Regional Harmonization, the study involves the conduct of multiple in-depth interviews, focus-group sessions and public seminars in Jamaica, Barbados, Trinidad and Tobago and five other Eastern Caribbean countries on ICT policy-making, as well as benchmark studies on best practices globally.

**Youth and ICT Research**

Young Jamaicans and Caribbean people are a central part of the research programme. It includes an important support component for young and emerging ICT research scholars and for active engagement with high school students interested in issues of ICTs and the environment. Two regional competitions form part of the project and have already been announced.

Under the Caribbean Young ICT Researchers’ Competition, candidates will be selected for sub-funding with priority assigned to proposals that involve significant filed research work. The proposals must also contribute to the development of ICT policies and improved indicators for the region. The research must be pro-poor in orientation and based strongly on relevance to Caribbean development. The proposals will be assessed by a selection committee, made up of senior academics, researchers and innovators from the region, as well as invited experts from external academic networks. Winners among emerging Caribbean ICT researchers will receive research grants, computers, study fellowships, smart phones and will also be assisted with publication opportunities.
The high school essay competition aims to provide an opportunity for students across the region to produce outstanding compositions on selected aspects of communication as it relates to the environment in the Caribbean. This competition seeks to select the best youth compositions from among able students across the high schools of the region. The response to date has been tremendous. Winners will be given financial support, scholarships and digital work tools towards accomplishing their research objectives.

Appreciation
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The MSB is most appreciative of the funding provided by the IDRC of Canada to help make these important research projects possible. Research funding for the Jamaica component was in the sum of J$30.7 million (US$356,000).

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