

Fifty Years of Civil Engineering at St. Augustine: The First Decade (1961-1971)

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Abstract: *The Department of Civil Engineering (Department of Civil and Environmental Engineering since 2003) has come a long way from a modest beginning with less than ten students and only three staff members in 1961. Since its inception, it has produced over 1,000 graduates in Civil Engineering who are, and have been, responsible for the design, construction management and maintenance of infrastructure in the Commonwealth Caribbean. Moreover, a number of its alumni have risen to prominent positions locally and internationally. Simply put, it has gradually transformed itself from a modest Civil Engineering Department into one of the leading centres of advanced instruction in this study field in the Commonwealth of Nations. The objective of this paper is to present a brief account of its formative years.*

Keywords: Caribbean, Civil Engineering, Education, History, University

1. Introduction

The motivation for writing a history of the Department of Civil Engineering (since 2003 Civil and Environmental Engineering) comes from three different sources. First, is the exhortation of late Hunter Rouse, a renowned professor of Hydraulic Engineering at the Iowa Institute of Hydraulic Research of the need to, and importance of, properly documenting the historical development of an institution, lest the on documentation on which such a history must be based disappears (Rouse, 1982). Second, there are the books on the history of prominent academic institutions, such as Imperial College (Gay, 2007), Cambridge University (Leedham-Green, 1996) and California Institute of Technology (Goodstien, 1991), and on the Department of Civil Engineering at Imperial College (Brown, 1985), which are of immense value for anchoring and continuing the academic reputation of said institutions. Third, are the haunting words of Nobel Laureate in Literature, V.S. Naipaul, who wrote: “Without writing, without literature, the past constantly ate itself up.” Naipaul further explains that in the absence of a recorded past the very inheritors of that past are left with an incomplete understanding of themselves, or misunderstandings of themselves and their traditions; while others (outsiders) misunderstand and/or represent them to the world (Naipaul, 1998).

Although the building and design of bridges and the design and maintenance of waterworks are indispensable parts of modern life, the role of a Civil Engineer remains

somewhat obscure to many people. If this is so today, it was even more so in the 1950s and 1960s, when the Civil Engineer was even more an enigmatic character on the West Indian landscape. In 1961, when the Department of Civil Engineering, hereafter referred to as the Department, was first established at the University College of the West Indies, many West Indians were unfamiliar with the discipline of Civil Engineering. In fact, as many engineers who began their studies or careers in the 1960s would explain, to the average West Indian, the engineer was simply “an Englishman,” “a white man”, and as such, his mystique, in the social milieu of the last days of colonialism, was heightened (Phelps, 2007; Julien, 2008; Suite, 2007).

There was a chronic shortage of qualified West Indian Civil Engineers in the West Indies of the 1950s and 1960s. Polls taken in 1955-1956 showed that there were only 370 engineers working in the West Indies; and most of these were expatriates working on contracts. Moreover, 240 West Indian engineering students were registered in universities abroad (UNESCO, 1969, pp.9-10). Engineering, however, was not the first career choice among West Indian men at this time. Medicine and Law seemed to be far more attractive to people who wanted to pursue studies in one of the professions.

Yet, in the physically and socially developing pre-Independence West Indies, the need for local engineers was becoming increasingly apparent. Expatriate Engineers hired on a contractual basis were costly (UNESCO, 1969, pp.10). Moreover, it is questionable

how comfortable many would have been with accepting contracts which necessitated relatively long periods of residence in the West Indies, no longer under British Crown; with (to the mind of the foreigner) questions surrounding its future economic, political and social stability outside of British rule. The need for civil engineers of the West Indies, and resident in the West Indies, was long recognised. The rapidly expanding social and economic development that was taking place in many countries of the pre-Independence West Indies made that need even more pressing. Islands such as Trinidad and Jamaica were growing economically and as such their infrastructural needs were also growing. Engineers were required to spearhead these changes.

This paper describes the gradual transformation of the Department from a fledgling institution of 10 students in 1961, into one of the leading centres of advanced instruction in its field in the Commonwealth of Nations. It specifically examines the foundational decades of the Department's existence in the 1960s and 1970s. It is part of an ongoing research project into the History of Civil Engineering in the University of the West Indies and the wider West Indian community. Regarding The University of West Indies (UWI) St. Augustine, an excellent account can be found elsewhere (Brereton, 2011).

The first author made an attempt to interview as many persons from the Department's first decade as was possible. It should be noted that such eye-witness testimony plays a vital role in history, and is an essential ingredient in modern historians' bringing the past to life (Moorhouse, 2010; Ritchie, 2003). Moreover, "it can give back to the people who made and experienced history, through their own words, a central place." (Thompson, 2000, p. 3)

2. The Origins

West Indians who wanted to study Civil Engineering, or any kind of Engineering, did so in British universities; generally on some sort of scholarship, such as the Colonial Development Welfare Scholarship. However, "with the usual result", as one report of United Nations Educational, Scientific and Cultural Organisation (UNESCO) put it, "that too few returned to their homes to practice what they had learned" (UNESCO, 1969, p. 10). For a region on the brink of Independence; a region with rapidly expanding industries in bauxite, oil, and construction to name but a few; heavy reliance on foreigners was seen as untenable.

The *raison d'être* for the Faculty of Engineering was to create a local pool of qualified engineers, who understood the West Indian environment, who were willing to remain working in the West Indies contributing towards its economic development (UNESCO, pp.10, 24). The Colonial and local Governments felt that the time had come to establish a

School of Engineering in the region. After ongoing talks on the subject, on 25th August 1959, a Plan of Operation was signed for the establishment of the Faculty of Engineering. The planned Faculty would be operated by the United Nations, which would serve as the project's Special Agent; and funded by the United Nations Development Programme (UNDP), with a counterpart contribution from West Indian Governments.

3. Why Trinidad

The establishment of the Faculty of Engineering in Trinidad was the result of negotiations, and insistence of Sir Arthur Lewis who argued that doing so was essential to regional spread and fairness in the economy. It also made good economic sense given the heavy industrial path that was laid out for Trinidad and Tobago. By the time of the Faculty's establishment, the Trinidad oil industry had doubled in capacity and size and its sugar industry continued to grow. The Government had the desire, as well as the wherewithal to support the Faculty financially.

Moreover, it was felt that locating the new Faculty in Trinidad would bring balance across the three campuses, both in terms of academic offerings as well as infrastructural development on the campus. The St. Augustine Campus was felt to have sufficient land availability to support a new Faculty. The Faculty was funded by the Ford Foundation (Buildings), United Nations Development Programme (Operating support with UNDP Experts), UNESCO (Equipment) and the Government of Trinidad and Tobago.

4. The Physical Facilities

Like all of the rest of the Faculty of Engineering, Civil Engineering functioned without facilities to call its own. It was housed in temporary accommodation when teaching began in 1961. By the end of 1962, the planned building of 5,400 square meters was completed; and in an historic commissioning ceremony on 1st February 1963, the Faculty building was formally opened, and then opened to the public on the following day. Like all other Departments in the Faculty of Engineering, the Department's initial equipment and laboratory budget was reduced by 1969 in order to facilitate the extension of the contracts of its academic staff. Still, staff and students of that time describe the facilities as adequate. For many students who had come from islands which did not possess large industries, engineering companies, or engineering facilities, there were no previous opportunities for exposure to such equipment. Many past students explain that they felt impressed by their laboratory facilities.

5. The Student Body

When the Faculty of Engineering began in 1961 most of its entrants were in the Civil Engineering Discipline. In the first graduating class, class of 1964, 6 of the 17

(35%) of Engineering graduates were Civil Engineering Students. In the second graduating class, class of 1965, 14 of the 28 (50%) of Engineering graduates were Civil Engineering Students. By the third graduating class, class of 1966, however, Civil Engineering graduates accounted for 25% of the graduating class and that number continued to decline well into the 1980s. Most of the students enrolled in the Department were scholarship recipients. Until 1975 all were men; these young men came from socially diverse circumstances. Most students came from the island of Jamaica and others came from then British Guiana, Barbados, Grenada and other Commonwealth Caribbean Islands.

Interviews with a number of the earliest graduates of the Department reveal that one of the main deciding factors for them enlisting to pursue Engineering at such a new Faculty was family economics. First, most of the early students came to the new faculty on scholarships, either issued by the University itself, their home government, or a philanthropic or corporate entity of the region. Second, for many it was more feasible to pursue their studies, given the attendant living expenses, within the West Indies, as opposed to travelling to a university in the United Kingdom or North America. Many of the early students came from multi-sibling families; a lower cost for one child attending university put the family in a better financial position to allow their other children to attend university (Reid, 2008).

Although family finance and convenience were major deciding factors for many, when asked whether they felt that they were in any way settling for a comparatively inferior education, given that the traditional universities selected by West Indians for Engineering degrees were British universities with an old reputation for conferring such degrees, respondents stated that they did not feel that that was the case. As one prominent Jamaican engineer, Mr. Vincent Lawrence explained, by the 1960s West Indian society had had a very positive view of the University's graduates in the other fields. Many graduates had entered the teaching profession and had created a very positive impression on their secondary school charges, who in turn surmised that the intelligence and ability of their teachers suggested that the institution of higher learning that these teachers attended was one that was fully capable of producing top class engineers (Lawrence, 2008).

Engineering students in the 1960s and 1970s usually shared common hall accommodation at Canada Hall. As many explained, this, combined with the common first year courses that all Engineering students took, bred a sense of personal and regional camaraderie, which remained with many of them to this day (Chin, 2008; Mellows, 2007; Suite, 2007). A strong example of this is the *Jentech Consultants Limited* engineering company of Jamaica. This company was founded in 1972 by five (5) men who were cohorts and friends at the Faculty of Engineering. Three of these men, Mr. Wayne Reid, a

Jamaican, Mr. Gordon Hutchinson, a Barbadian, and Mr. Vincent Lawrence, a Jamaican, were cohorts and friends at the Department of Civil Engineering during the period 1964 to 1967. Today, these men boast of a friendship that spans more than four decades, and their company, *Jentech*, continues to offer prizes, bursaries and scholarships to students of The UWI's Faculty of Engineering, and employs graduates of the Department of Civil Engineering.

The student experience, however, was not always a positive one. Students grappled with staff shortages, which sometimes resulted in the cancellation of some courses. Dropout rates were high. Most of the student body was made up of very young men, just out of secondary school, who had to adapt to a study arrangement that was markedly different from anything they had been used to at secondary school, and some did not acclimatise well.

In the first half of the Twentieth century, secondary school education was still a relatively scarce commodity, and attendance was still seen as an honour and privilege. Many teachers saw their role as coach and mentor; they took a very personal interest in students' study and supervised them very closely. Students' academic performance was frequently checked by their teachers. The university study environment was markedly different. It did not involve homework or frequent quizzes; and study was unsupervised and independent. Some of the students did not adjust to this new style of independent study, and deferred their study to examination time. Examinations took place at the end of the academic year, and for most, the required preparation was far too much to be successfully deferred until exam time.

Staff members complained that 'examination-orientedness' was a problem for some of their students; that is, the students' emphasis was on passing exams rather than consistently preparing for a career in engineering. UNDP analysts feared that this compromised the prime objective of the Department: to create well-trained and qualified regional engineers.¹⁰ Their recommendation was that, in addition to the final examination, stringent mechanisms be put in place to ensure that students were preparing sufficiently during the term; interim examinations should be put in place; and that more intense supervision should take place until students had gained the maturity necessary for successful university study.

6. Course Offerings

The students of Civil Engineering shared a common first year of study with other engineering students. All first-year engineering students studied Mathematics, Science of Materials, Applied Thermodynamics, Strength of Materials and Theory of Structures, Mechanics of Machines, Applied Electricity, and Engineering Drawing. By the second year, students specialised. Civil

Engineering students did level II courses in Mathematics, Theory of Structures, and Strength of Materials; and began their course of study in Surveying, Mechanics of Fluids (see Figure 1) and Soil Mechanics (see Figure 2).

In their third and final year, students pursued level III courses in Mathematics, Strength of Materials, Theory of Structures, Soil Mechanics and Applied Geology, Mechanics of Fluids, Surveying, Electrical Technology, and had a special project which took them to various West Indian countries to work in, observe, and report on Civil Engineering projects out in the field, and on other ongoing public and private projects in various West Indian countries. The special project involved, for example, observing and reporting on Government waterworks or road building projects.

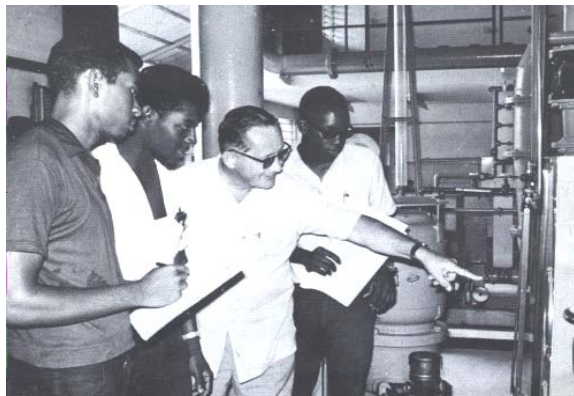


Figure 1. Fluid Mechanics Laboratory (C. 1964)
(Dr. K.A. Everard, Head of Department, explaining the centrifugal pump experiment)



Figure 2. Soil Mechanics Laboratory (c. 1970)
(Harold Woodruffe, Second Right and Michael Paty, Third Right)

7. Academic Staff

As a result, the operations of the Department were steered by the UNDP, specifically its Special Fund Component for the period 1960-1968. It was originally envisaged in 1960 that The UNDP would appoint one full lecturer (an expert in each of the branches of

Engineering) and one senior lecturer in the first year of operations, whose appointment would last for five years; then a second senior lecturer would be appointed for a term of four years. However, by 1962 the UNDP's mandate was to develop a cadre of home-grown engineers, and to this end in 1962 the original Plan of Action was amended to allow fellowships for West Indian staff members to pursue advanced degrees.

When the Department of Civil Engineering was formed, it was staffed by three people, one of whom was a West Indian. From its very inception, it was plagued by staffing difficulties - a problem which continues to trouble the Department to this day. In the original plan of action, each Department was to be headed by experienced and respected international experts in the respective fields appointed by the UNDP. The first head of Department Dr. K.A. Everard was appointed by the UNDP. Responding to newspaper advertising and publicity about the forthcoming Faculty in 1961, Professor Harry O. Phelps applied to join the Department of Civil Engineering. Phelps severed until his retirement in 1997. He was the very first West Indian working in the Department. He came to the Department directly out of industry. He had previously been an Assistant Drainage Engineer with the Ministry of Works.

Dr. D.B. Narasimhaiah, a UNDP Civil Engineering expert from India, was appointed Head of Department in 1965. He was soon esteemed a valuable resource both in the University and in the wider community (see Figure 3(a)). However, the sense of stability he brought to the Department of Civil Engineering was shattered by his sudden death in 1967 (UNESCO, p.22). Like the other three Engineering disciplines offered on the St. Augustine Campus, the Department of Civil Engineering found it difficult to attract people willing to pursue an academic career, as opposed to working in industry. As Harry Orville Phelps, a young Civil Engineer, who at age 32 joined the Faculty in 1961 explained: "Academia was not the first career of choice for many Civil Engineers" (Phelps, 2007). Among Civil Engineers it was and still is a badge of pride to "work in the mud" (Shrivastava, 2008).

In 1968, Dr. P. Selvanayagam was recruited from University of Ceylon (later known as University of Sri Lanka) to the post of Professor and Head of Department. Dr. Selvanayagam's area of specialisation was structural engineering. He had obtained his PhD at Imperial College in London in 1950, where he had worked on analytical and experimental investigation of the distribution of stress in shell structures. At the UWI, he carried out pioneering research work on the use of local aggregates in the asphalt and bitumen mixtures (Selvanayagam, 1969), and on the strength of soil cement blocks for low cost housing units (Selvanayagam 1970).

Several members of the core staff were recruited based on their reputations as scholars (Phelps, 2007). For almost a decade of the Faculty's existence, most of the

staff who taught in the first decade programme were not PhD graduates. Many were establishing themselves in industry and were recruited from industry as opposed to academic institutions.

By the late 1960s, this was beginning to change. It was the mandate of the UNDP to establish a West Indian run university which was independent. The way felt to do this was through a cohort system. The senior academic staff members were UNDP appointees, UNDP experts in their fields. Under them were Caribbean teaching staff who were to further their study in preparation for more senior positions. The cohort system works on the principle that people will perform better and finish their study if they are placed in groups of individuals with similar goals; then the cohort system at the Faculty Engineering worked on the principle that it was more desirable for West Indian students to have West Indian role models form part of their teaching staff. The cohorts were supported by various fellowships which allowed them to pursue advanced degrees. By 1968, when the UN's mandate had come to an end, the small Faculty boasted that of its ten West Indian staff members, eight held doctorates.

In spite of its persistent staffing problems, the early staff members of the Department were inspired and driven. West Indian staff members were fashioning a future of possibility. They were a young staff, many of the cohorts were in their 30s with the vision to make the institution a respectable and renowned one (Phelps, 2007). recognising that they were at a department which did not yet have a standing in the academic world, which could not yet say that it had a tradition. In several areas the lecturers were the only ones on staff with specialisation in their fields.

Their former students describe them very fondly as mentors, "extremely bright" (Lawrence, 2008) with "a high level of competence in lecturing," (Sirju, 2007) who were "easy and readily accessible...always willing to assist students. Some freely socialised with their students at the students' guild hall. Yet, out of a sense commitment to the larger objective of creating a skilled cadre of local engineers, these lecturers did not encourage laxity. For example, they strictly upheld the regulation that did not allow students to fail examinations more than three times. One past student, Mr. Wayne Reid, remembered the 'famous' words of a lecturer gently upbraiding a student who had been neglecting his work by saying to him while playing billiards at the guild hall: "I will play billiards with you, I will lime with you, I will even drink with you, and [if you fail to perform] I will fail you" (Reid, 2008). Mr. Vincent Lawrence, past student, attributes the approach of early faculty to student relations to the fact that their West Indian lecturers came from the same social background as their students and therefore understood their psychological needs; they understood what was required to help students succeed (Lawrence 2008).

8. Engaging West Indian Society

The Civil Engineering Department was of necessity outward looking. From its inception its interest had to be the larger society in which it found itself. This was so for two reasons: It was designed to serve West Indian Community and its need for local engineers, but also its local staff was mostly recruited from local industries or from the Government. Its members lent their practical and academic skills to the larger community. One of the Department's founding members, Professor Harry O. Phelps (see Figure 4), who was also one of the founding members of the Association of Professional Engineers of Trinidad and Tobago (APETT), was instrumental in starting a journal for the organisation in 1961 which he edited (UWI, 1963; APETT, 2008). This was the same year he began teaching at the University.

In 1962, Dr. K.A. Everard, Head of Department (1961-1966), was appointed on a Board of Inquiry to investigate causes of workers discontent in the dispute between the Princes Town Special Bus Service Co. and the Transport and Industrial Workers Union. Dr. Everard also invited University of Michigan Professor Earnest Boyce to the Department to discuss the possibility of offering Public Health Engineering at the Department of Civil Engineering, but this did not materialise.

In 1964, the Saint Lucian Government invited the Faculty for advice on the development of technical education on the island. Dr. Harry Phelps was among a three-member team which left for the mission. In 1971, Senior Lecturer, Mr. C.A.W. Deane (see Figure 3(b)), was asked to advise Caribbean governments on coastal control and development (Deane et al. 1973). Under the auspices of the Department Professor I.D.C. Imbert carried out research into dry package cement mortar and concrete, which was being marketed by 1965 (see Figure 3(c)).

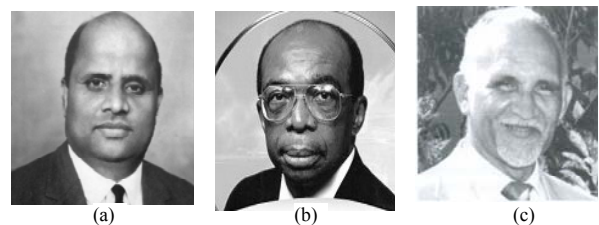


Figure 3. (a) Late Dr. D.B. Narasimhaiah, Head of Department 1965-1968; (b) Late Mr. Compton Deane (1931-2007); (c) Late Emeritus Professor I.D.C. Imbert (1931-2009)

The 1970s served as a watershed period for the Department. It was inevitable that discussions about race relations, particularly as these affected employment equity, during the Black Power Movement, would have some effect on the Department. As discussions arose about the lack of opportunities available to non-white West Indians, the Faculty's administration applied its

thinking to how opportunities could be created for its young graduates; and how the Faculty could work with local and regional stakeholders to begin to allow West Indian engineers to take up leadership roles in infrastructural and economic development (Julien, 2008). It is at this time also that some countries in the region were at the cusp of economic prosperity and would embark on the types of industrial development that made civil engineers indispensable.



Figure 4. Emeritus Professor Harry Phelps with some final year students, and academic Staff (Photo taken on 20th June 1990)
(Staff members L to R: T. M. Lewis, A. K. Sharma, M. W. Chin, H.O. Phelps, G.S. Shrivastava, K. Venkataraman)

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In this regard, the 1970s represented a boom for the Department of Civil Engineering. The main reason for this boom was the success of Trinidad's oil industry, as well as Jamaica's bauxite and tourism industries. The government of Trinidad and Tobago, for example, had planned a number of infrastructural development projects for which a cadre of local civil engineers was necessary. In preparation for this need, the government then began injecting the needed capital into the Department. Similarly, Jamaica, one of the countries providing subventions to the University was developing profitable bauxite and tourism industries. The success of these industries resulted in an increased number of scholarships to Jamaican students wishing to study engineering.

Moreover, these were exciting times for civil

engineers as the number of projects requiring the services of a civil engineer in Jamaica and Trinidad and Tobago was increasing at a rapid pace. In these developing societies anxious to bring their people the amenities of modern twentieth century life, roads had to be built; highways were needed; pipe-borne water had to be brought to communities in need of it; more schools were required, refineries, manufacturing and processing facilities were essential. Success in industry gave countries such as Trinidad and Tobago and Jamaica the financial ability to address these needs. Moreover, the departure of British expatriate civil engineers after the Independence movements in the region saw the emergence of a greater number of West Indian engineering consultancy firms, which further created employment opportunities for civil engineering graduates.

9. Conclusions

The Department of Civil and Environmental Engineering was born out of an impetus during the colonial era to have a cadre of engineers of and from the West Indies. The developmental vision of many West Indian countries for their growth as independent nations made the need even more pressing. In its first decade the Department had become entrenched in the societies from which its students came. Both staff and students alike of the University of the West Indies' Department of Civil Engineering served as employees, consultants and special advisers on the projects which saw the materialisation of West Indian infrastructural goals.

To this group, our societies literally entrusted the building of our future. They became partners with West Indian governments, and key policy makers who helped chart the economic future of their countries. This first group of staff and students worked towards lifting their people out of the depravation of inadequate water and sewerage facilities, the inconvenience of inadequate road networks, and insufficient healthcare facilities. Some worked to ensure that even in the face of such rapid exciting development, and modernisation, the environment would be protected. As a result of these efforts, many of the staff and students who graced the halls of the Department of Civil Engineering in the 1960s and 1970s went on to become renowned and respected in the region, and indeed the wider world.

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