



**UNIVERSITY OF PERADENIYA
SRI LANKA
JUBILEE 1942 - 92**



**A HISTORY OF THE
FACULTY OF ENGINEERING
1950 - 71**



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(REVISED EDITION)

**PERADENIYA
1992**

FOREWORD

The need for an authentic account of the history of the Faculty of Engineering has been felt for some time and this publication is the first step towards fulfilling that need. It mainly covers the first twenty one years of the history of the Faculty since its inception in 1950.

I am very thankful to Professor S. Mahalingam for writing this historical account. Prof. Mahalingam is eminently suited for this task because of his close association with the Faculty throughout its existence and his intimate knowledge of all its affairs.

It is hoped that this publication, coming out in the Jubilee Year of the University of Peradeniya, will be of use to those who are interested in the history of engineering education in this country.

Prof. M.P. Ranaweera
Dean, Faculty of Engineering

PREFACE TO THE REVISED EDITION

The extraordinary story of the Faculty of Engineering and its predecessor the Ceylon Technical College was written in 1987 for the benefit of the younger members of the staff, engineering undergraduates and students of the history of tertiary education in the country. The writer is one who has had long association with both institutions, is familiar with the events described in these pages and has had access to many relevant papers. A limited number of copies were made in 1987 and sent to institutions likely to be interested in the subject. With the Golden Jubilee celebrations of the University of Peradeniya now under way, there appears to be a wider interest in such historical matters. This revised edition is therefore being published by the Faculty of Engineering in the interests of historical accuracy, and to place on record the events that have shaped engineering education in Sri Lanka, before they become subjects of speculation and dubious conclusions.

The valuable assistance of Prof. E.M.N. Ekanayake of the Computer Centre and his staff, Ms. P.M. Samaratunge and Ms. S.S. Madahapola, in the preparation of this book for publication is gratefully acknowledged.

Faculty of Engineering
University of Peradeniya
December 1991

S. MAHALINGAM

PREFACE

There appears to be a need for a history of the development of University-level engineering education in this country from its beginnings about 45 years ago. At meetings, seminars, workshops etc., where the subject is engineering education, criticism is sometimes heard of the form and quality of our degree courses. The critics are usually people who have only a cursory knowledge of the factors that have influenced the development of our teaching institutions. Often the views expressed and the conclusions drawn by them are based on incomplete or incorrect information. Here, in the Faculty itself, an understanding of our past difficulties, our successes, our failures and our mistakes will help those who have to deal with the grave problems that confront us today. Students, too, will find much of interest in the story of the institution in which they are spending the best years of their lives.

Last year I was asked by some colleagues to undertake the writing of a history of the Faculty of Engineering. My qualifications for the task are that I had been a student at the Ceylon Technical College when it had its link with the University of London, and a teacher in the Faculty since its inception in 1950. As the histories of these two institutions are inextricably linked, what was required of me was to write the joint story. The undertaking has not been an easy one. After the closing down of the Ceylon Technical College's degree courses, the files containing its transactions with the University of London appear to have found refuge in several government technical institutions before finally disappearing. The records of the Faculty of Engineering, too, presented problems as there are gaps in many of the documents relating to its formative years. I have been wary of trusting individual memories - including mine - as one man's recollection can be another man's imagination. The following pages contain the story of the Ceylon Technical

College's association with the University of London (1942-50), the events leading to the establishment of the Faculty in July 1950 and the many growing-up problems that had to be tackled up to Jan. 1972. The latter date marks the passing of the University of Ceylon Act of 1972 which amalgamated all the Universities in the country into a single unit. It also created a new Campus with a Faculty of Engineering, a step which would have a profound influence on our development plans. I am leaving the writing of the history of subsequent events and their far-reaching consequences to a younger and more competent person.

I would like to acknowledge with gratitude the valuable help given to me by Professors E.O.E. Pereira, E.F. Bartholomeusz and W.P. Jayasekara all of whom are familiar with the events described in these pages. My sincere thanks are also due to Mr. J.B. Dissanayake and Mr. S.K. Seneviratne for their assistance with library research and for their efforts in compiling the statistics of Engineering graduates given in Appendix IV.

Faculty of Engineering,
University of Peradeniya.
June 1987.

S. MAHALINGAM.

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1. INTRODUCTION : UNIVERSITY EDUCATION IN CEYLON

"It was estimated before the war that a third of the external students [of the University of London] carried out their studies at teaching institutions in London, about a third at university colleges and technical colleges in the provinces, and about a third carried out their studies privately. About a tenth of them were resident overseas, with Ceylon providing the largest proportion....."

Harte, N. : "The University of London 1836 - 1986". (1)

1942 was a year of important educational changes in Ceylon. Even as the tide of war made its high-water mark in that year, two major academic developments took place. In the first the University of Ceylon was established on 1 July 1942 by the amalgamation of the Ceylon University College and the Ceylon Medical College which had been for some years the main centres of university-level education in the country. This merger was brought about by the Ceylon University Ordinance (No.20 of 1942), and the Principal of the Ceylon University College became the Vice-Chancellor of the new university. The Ceylon University College had been established in 1921 and had been granted recognition by the University of London for some of its external degrees. During its brief period of existence, 1921-42, it had produced 580 graduates of the University of London. The Ceylon Medical College was a much older institution, and its LMS (Licentiate in Medicine and Surgery) had been recognized by the General Medical Council of Great Britain in 1888.

The second important event was that, in a parallel but unrelated development, "provisional recognition" was granted to the Ceylon Technical College, Colombo by the University of London for presenting students for its External BSc(Engineering) degree.

Engineering education in Ceylon had now reached the university college phase. Whereas the Ceylon University College had gone from strength to strength during its period of growth 1921-42, the Ceylon Technical College had a very troubled adolescence. Its failure to build up a body of competent teachers, improve its laboratory facilities and develop its courses of study brought about a crisis in its relationship with the University of London. In Dec. 1949 the University of London indicated its intention of reconsidering the provisional recognition granted seven years earlier in view of some shortcomings in the College. The degree courses were clearly in jeopardy.

At its inception the University of Ceylon had four Faculties: Arts, Oriental Studies, Science and Medicine. Reference to Engineering appears in the First Annual Report of the University Council 1942: "We are not unaware of the need for development in other subjects notably Engineering..... We think, however, that the doctrine of the inevitability of gradualism applies to Universities as to other institutions, and that our work might be scamped if we tried to develop too quickly ..." (2). In October 1945 the University Council resolved to establish a Faculty of Engineering in Peradeniya in 1948, a date that would meet with several postponements due to a variety of non-academic factors.

The crisis at the Ceylon Technical College in Dec. 1949 led the Ministry of Education to re-examine the structure of engineering education in the country and as a result a request was made to the University of Ceylon to open a Faculty of Engineering by 1 July 1950. The time available for the recruitment of staff and organization of the courses of study was only four months! The histories of the University Faculties are all different, but that of the Engineering Faculty is certainly more different than the others.

The first batch of freshmen to the new Faculty was selected on the basis of a Special University Entrance Examination and by

interviews. The Faculty also had to act as foster-mother to three batches of students - 189 in all - transferred to it from the Ceylon Technical College where the teaching had been stopped. These students had to complete their courses of study and sit the University of London examinations which would continue up to 1953. These circumstances, together with the fact that the Faculty would continue to use the facilities of the Ceylon Technical College for the period 1950-64, have had their influence on the organization of the courses and departments of study. It is therefore appropriate to start with a brief history of the engineering degree courses at the Ceylon Technical College.

2. ENGINEERING AT THE CEYLON TECHNICAL COLLEGE

".... And so the production of manager-technologists was entrusted to polytechnics which in the course of the [nineteenth] century acquired the rank and prestige of universities. In France there was already the famous Ecole Polytechnique which became the prototype of all colleges of higher technology. In Germany some technical schools were raised to the status of Technische Hochschulen and the others were founded on the model of the Ecole Polytechnique. In Switzerland one of the first activities of the new federal constitution was to found a central polytechnic in Zurich. In Holland a polytechnic school was opened in Delft in 1864, to train works managers, civil engineers, naval architects and science teachers for schools. The response spread even to the United States: the Massachusetts Institute of Technology was founded in 1865....."

Sir Eric Ashby (1958) (3)

The College

The Ceylon Technical College Department - to give the institution its full name - was a department under the Ministry of Education, subject to the full rigour of bureaucratic control. In 1942 its main divisions were the degree courses in Engineering and Commerce. It also conducted a large number of sub-professional courses for Apprentices, Draughtsmen, Motor Mechanics and assorted craftsmen. Among its smaller sections was an Arts and Crafts unit. The organizational structure of the College resembled that of the Polytechnics in Britain, and it conducted Day and Evening classes in a wide spectrum of subjects. Its permanent staff was rather small in number, and it had to rely on a large body of Visiting Lecturers, many of whom were employees of government departments. Located in the heart of the city, close to the centres of commerce and transport, the College was unable to provide its students any

recreational facilities. The Principal of the College at this time was Mr. E.R. Bartlam, an Englishman whose family had had a long association with this country. It was he who had negotiated the provisional recognition of the engineering degree courses by the University of London.

The Degree Courses

In the late 1930s the courses at the Ceylon Technical College were only up to the University of London's Intermediate Examination in Engineering - the equivalent of the present First Examination in Engineering - and the Associate Membership Examinations of the three major professional Institutions - Civil, Electrical and Mechanical - in London. There were no prospects of degree courses in Engineering being conducted. However, the exigencies of the wartime conditions and the need for more engineers led to the Ceylon Technical College being given "provisional recognition" in 1942 for presenting students for the External Examinations in Engineering of the University of London, without the formality of the inspection of the teaching facilities at the College. This was very fortunate because the laboratory equipment was meagre and the staff strength inadequate.

The degree courses were conducted by the three Engineering Departments - Civil, Electrical and Mechanical - and the Mathematics Department. As was to be expected in an under-developed region, the demand in the country was largely for Civil Engineers, and the enrolment was therefore largest in Civil Engineering. The courses available for the Part II of the degree examination in the four Departments were:

Civil Engineering:	Theory of Structures; Strength and Elasticity of Materials; Mechanics of Fluids; Surveying.
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Electrical Engineering:	Electrical Power; Electrical Measurements and Measuring Instruments.
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Mechanical Engineering:	Applied Thermodynamics.
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Mathematics:	Mathematics (Pure & Applied).
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Four subjects were required for the Part II of the degree examination in Engineering while five compulsory subjects were required for the Part I. (The College also had small supporting departments of Physics and Chemistry both of which provided courses for the First year, Chemistry being an optional subject. Engineering Drawing for the Intermediate Examination was taught by the Department of Mechanical Engineering. The Engineering Workshops provided basic practical training in the First Year).

It was only in 1948 that College candidates were able to offer Telecommunications as a subject for the Part II. This was made possible by the recruitment to the staff, on contract, of an expatriate lecturer in the subject. A course in the subject of Principles and Design of Electrical Machines was never available. Theory of Machines - now known as Mechanics of Machines - was also not a subject in the Mechanical Engineering Part II course at the College. There were no qualified teachers in the College for that subject and none was available as a Visiting Lecturer. However, a course in this subject was available at the Part I level, where it was taught by the Lecturer in Mechanical Engineering, who was actually an Electrical Engineer by training.

In the grouping of subjects Strength of Materials and Mechanics of Fluids were placed in the Civil Engineering Department because the only lecturer available for these two subjects happened to be in that Department. In present day practice most Universities have Strength of Materials in the Mechanical Engineering Department, while for Mechanics of Fluids the Civil and Mechanical Engineering

Departments have separate courses and laboratories, dealing with different aspects of the subject. But the Ceylon Technical College grouping of subjects, which was due to staff constraints, was also retained by the Engineering Faculty for the same reasons. It was then inevitable that the new subject of Metallurgy in the Faculty would go to the Civil Engineering Department as it is often associated with Strength of Materials.

At the end of the four-year course the students of the Ceylon Technical College sat for the College's Diploma in Engineering Examination. This was held in March at the end of the Third Term. The University of London held its examinations in June, at the end of its Third Term. This fortuitous arrangement helped many students who thus had three months of study time to prepare for the London examination, and also to complete their Course Work. The Diploma Examination was also a dress-rehearsal for the degree examination to come three months later. The University of London's examination agency in Colombo was the Department of Education. Colombo was the only regular BSc(Eng.) examination centre outside Britain, but special arrangements were made in other countries in some post-war years, for a candidate or two serving with the British Army overseas.

The examination scripts and all the Course Work submitted by the students were sent to London by sea. The University of London usually accepted the marking of Course Work by the Ceylon Technical College staff, but carefully scrutinized the work for its quality. Detailed comments and suggestions were sent to the College after each examination, but not much attention appears to have been paid to these warning signals. Unsatisfactory Course Work standard in one subject was to cause a crisis in the College later on.

Staff: Room at the Top

From the very inception the Engineering degree courses of the Ceylon Technical College were seriously handicapped by an acute shortage of competent staff. There were very few qualified men in

the country, and the war years (1939-45) were hardly the time to attract expatriate academics or professional engineers as teachers. No department had more than three teachers and none of the staff had post-graduate degrees; some of the staff were non-graduates with professional qualifications only.

The responsibility for organizing the laboratories and the courses of study fell mainly on the shoulders of Mr. P.H.D. Silva (later P.H.D.S. Wikramaratna) (Civil Engineering), Acting Professor R.H. Paul (Electrical Engineering) and Mr. (later Acting Professor) D. Mukherjee (Mechanical Engineering). (The designation "Acting Professor", which is unknown in Universities, was the invention of the bureaucracy. Later on the College vocabulary would be enriched by another delightful creation: "Lecturer-in-Training".)

Of the three engineering departments the weakest was the Mechanical. It could offer just one course for the Part II: Applied Thermodynamics. There was no one to teach Theory of Machines for the Part II and the effects of this deficiency would be felt by the University of Ceylon later on when it began to recruit staff in 1950.

In the Administration Report 1944-48 the Director states:

"....The teaching staff remains practically the same as before whereas the numbers of students have increased by over 50 per cent. Consequently it is with the greatest difficulty that instruction is carried on in the various courses...." (4)

In the same report he adds:

"It is my duty to place on record the extremely difficult position with regard to staff. Although the reorganization proposals laid down as an essential condition that the College shall have adequate staff, it has not been found possible to secure the services of teachers of the requisite standard. Particularly in the grade of Professor it was not possible to recruit sufficiently qualified men locally or from abroad, and all these posts have

remained vacant since their creation in 1942, except for a brief period when one of them was filled for one and a half years....."

The reference to one and a half years is to the appointment of Prof. R.H. Paul who, on his elevation to the post of Director in 1945, vacated the Chair of Electrical Engineering (Acting). The Chair of Mechanical Engineering was for a brief period filled by an "Acting Professor", an expatriate, who retired in 1948. The Chair of Civil Engineering was never filled. Only the Mathematics Department, staffed by Science graduates, had no difficulty in finding competent teachers.

The reasons for the continuing acute staff shortage, even after the end of the war in 1945, were quite obvious. Whereas the University of Ceylon was at that time offering its Assistant Lecturers post-graduate training leading up to the Ph D, and a definite scheme of career advancement thereafter, no such prospects were available to an Assistant Lecturer at the Ceylon Technical College. The College was a government department, controlled by a remote and sluggish bureaucracy that was unfamiliar with the problems of a University - level institution. No provision was ever made for post-graduate training of its staff, and promotion was simply a matter of vacancies, qualifications and that most important element of all : seniority. Designations such as "Acting Professor" and "Lecturer-in-Training" reveal the mind of the bureaucracy that controlled the College. Their effect was merely to increase the number of rungs on the ladders to the top posts which could not attract competent outside candidates. In fact the College sometimes tended to attract "refugees from Industry". The Director's Administration Report for 1950 has this to say:

".....The dearth of suitable teachers, of technical subjects in particular, is a world-wide phenomenon. Recruitment has not been helped by the fact that these posts are advertised as "temporary" and "non-pensionable" although they have been on the cadre for a considerable while now....." (5)

There was really no "dearth of suitable teachers" as far as the University of Ceylon was concerned. When its posts were advertised in April 1950, it had no difficulty at all in attracting competent applicants and filling all the cadre vacancies of the Faculty of Engineering with the exception of the Chair of Mechanical Engineering. The shortage of teachers was clearly not a "world-wide phenomenon".

The staff problem in the Technical College became very critical in 1948 when the only permanent member of the Civil Engineering Department - an Assistant Lecturer! - resigned, leaving the teaching load entirely in the hands of assorted Visiting Lecturers and Temporary Instructors. "This unsatisfactory state of affairs is bound to tell in the long run, and will be manifested in poor results and break-down in the health of members of the staff," was the gloomy forecast in the Administration Report of 1949 (6). The prediction of "poor results" turned out to be an accurate one indeed! The staff strength did improve a little later on, and at the time of the closing down of the degree courses in 1950 it stood at about 30%, with all Chairs vacant.

Due to the acute shortage of staff some teachers were entrusted with subjects outside their areas of specialization. For many years the Lecturer in Mechanical Engineering was an Electrical Engineer while an Assistant Lecturer in Electrical Engineering was a Civil Engineer.

The College had an Advisory Committee one member of which was Sir Ivor Jennings, the Vice-Chancellor of the University of Ceylon. In 1947 he offered to help the College by appointing Engineering teachers to the University and seconding them for service in the Ceylon Technical College. This was to be a significant step in the eventual establishment of the Faculty of Engineering. A Chair of Civil Engineering in the University was then advertised and Mr. E.O.E. Pereira was appointed in 1947. He took over the teaching of "Theory of Structures" at the Third and Fourth Year levels of the College, in addition to his main assignment of preparing plans for the

Faculty of Engineering at Peradeniya. The University authorities felt that "....this appointment will help the Technical College considerably though it is still very inadequately staffed; it will at least prevent a hiatus in the training of engineers, who are badly needed by the Government". (7)

The Collège continued to function with its makeshift arrangements when it was overtaken by a crisis from an unexpected quarter in Dec. 1949.

Visiting Lecturers from Industry/Field

The Ceylon Technical College was compelled to rely on visiting staff for its courses of study as it was unable to fill its vacancies. Some of them were good, others were not. When the subject of staff shortage is discussed at Seminars and Workshops these days the solution often proposed is Visiting Lecturers from Industry/Field. Who could be better to teach "real" engineering to students than the professionals actually in practice? This solution, which also has a ready appeal to Education administrators and to politicians, needs to be examined carefully. There is no doubt that practising engineers have a great deal of valuable practical experience, but can this experience be communicated to students in a classroom? It is not the same thing as a Medical Specialist teaching students in a hospital ward; the engineer cannot take his problems to the classroom and demonstrate them. It also happens sometimes that the older professional engineers are ill at ease with simple problems of analysis, which have to be taught in the classroom. In their professional work they would have left such matters to their younger subordinates.

Professor J.L.M. Morrison in his Presidential Address to the Institution of Mechanical Engineers, London in 1970 dealt with the subject of "Engineering Education". He recalled his University undergraduate days when the teaching of "design" in the engineering departments had come under criticism from outside. He said:

"The professional academics had been attacked by a fit of conscience and had decided to treat the matter seriously. So they added to the staff a man of mature years, of much experience and apparently of considerable competence in industry, and gave him the job. Thank goodness I forgot immediately most of what he told us which was either too elementary to be worth saying or entirely beyond our comprehension..... The exercise reduced to a combination of mechanical, utterly mechanical, drawing and a little simple arithmetic. Needless to say we spent the afternoons nominally devoted to "design" in more entertaining ways". (8)

It is therefore important to exercise great care in the selection of Visiting Lecturers. The mere fact that a person is holding a high professional position does not qualify him to be a teacher. In fact, his high position in the profession may sometimes be an impediment to his work in a teaching institution.

Laboratory Facilities

The last two decades have witnessed a rapid growth in the number of manufacturing firms that supply experimental facilities for engineering degree courses. It is a relatively simple matter today to equip all the laboratories of a Faculty of Engineering with ready-made apparatuses if the money is available. The situation was quite different in the 1940s. Basic components could have been bought abroad and laboratory apparatuses fabricated locally in the College Workshop. However, the personnel and expertise were not always available in those early days. As may be expected, some hasty improvisations had to be made in the laboratories for the first group of students sitting the London Final Part II examination in 1943. It must be remembered that laboratory equipment was less sophisticated at that time than it is now, and the emphasis was on simplicity of design and measuring techniques. A great deal of commendable pioneering work was done in some of the laboratories where the staff - young teachers of little experience in some cases - did well to

organize Course Work of acceptable standards, with judicious selection and design of apparatuses within the limited funds available. Some of these apparatuses have continued to be in use in technical institutions elsewhere in the country to the present day.

Library Facilities

During the war years not only books but even writing paper - for Course Work - were in short supply. In some subjects the only available text-book was that belonging to the teacher, who often shared it with his small class of students. After the war conditions began to improve, and by 1950 there was a fair number of books in the library. During the post-war period it was common for a student to buy at least one text-book for each subject. The basic text books published by Pitmans, Longmans and Blackie were comparatively cheap - priced at about Rs. 10/= to Rs. 15/= per book - and the student had no need to depend on the Library for such books. The reliance on books rather than on "lecture notes" was not only encouraged by the staff but was also essential in view of the shortcomings of the courses. It was also influenced by the fact that the examinations were conducted by a foreign university which frequently changed its examiners, as was evident from the names printed in the question papers. By contrast many students of the present day seem to rely on "lecture notes" only, since the examinations are internal, and some of the examiners remain unchanged for years - or even decades.

The number of Journals in the College library was small but then there was very little demand for them among the staff and students.

The College Administration : Reform by Nomenclature

In March 1942 there had been a reorganization of the Ceylon Technical College when it was detached from the Education Department and made into a separate Department. In spite of the success in obtaining recognition from the University of London the

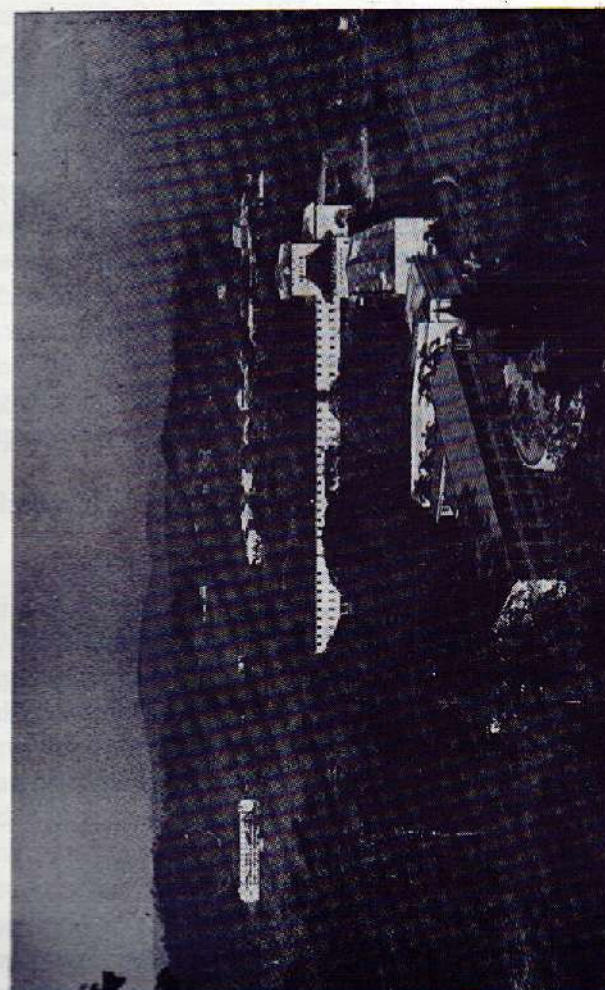


Fig. 1. View from Lower Hantane : in the background are the Engineering Complex, Akbar - Nell Hall and the foot-bridge across the Mahaweli Ganga. In the foreground : the Senate Building and the Faculty of Arts.

College was not functioning smoothly. There was much dissension among the teaching staff, and their problems had been brought to the notice of the Ministry of Education. As a result the post of Principal was abolished in Oct. 1944 and Mr. Bartlam had to retire from service. Shortly afterwards he left the country to take up an appointment in India. Prof. R.H. Paul, the Acting Professor of Electrical Engineering, was then placed in charge of the College in addition to his departmental duties. Some months later, in Jan. 1945, the post of Director of the Ceylon Technical College was created and Prof. Paul was appointed to it. With this appointment the Chair of Electrical Engineering fell vacant, and remained unfilled thereafter. When Mr. R.H. Paul retired from the post of Director in Feb. 1950, he was succeeded by Dr. S.L. de Silva, a Chemical Engineer. By this time the government had already decided to close down the engineering degree courses at the College and create a Faculty of Engineering in the University of Ceylon.

Scholarships for post-graduate training

In 1945 the government provided funds for the post-graduate training of engineering graduates in Britain, the awards being made on the results of the BSc(Eng)(Lond) Examinations. Three Civil Engineering graduates were selected for these scholarships in 1945 and arrangements were made for their practical training with reputed firms in Britain. This training was intended to lead them to the charter of the British professional Institutions. No academic training had been included, but one of the scholars made his own arrangements to do his Ph D while undergoing field training. This enterprise did not meet with the approval of the College authorities who insisted that the scholars of 1946 and 1947 - three in each year - undertake field/industrial training only. Further restrictions were imposed in 1948, when it was stipulated that the scholarship winners, on their return to Ceylon, should be prepared to serve the Ceylon Technical College "if called upon to do so". The point of interest here is that the college authorities were not promising to appoint the scholars to staff positions when there were vacancies; they

were merely seeking to "bond" the scholars so that their services could be demanded at any time the College felt inclined to do so. These harsh terms were not acceptable to any of the graduates of 1948 and subsequent years. No scholarships were awarded thereafter, while the College continued to bemoan its "dearth of suitable teachers" in the annual Administration Reports. This policy was a very short-sighted one indeed. The futile attempt at recruitment of captive scholars to the staff of the Ceylon Technical College was a setback to the engineering profession in the early days of its growth. The College could easily have emulated the example of the University of Ceylon, where a liberal scheme of post-graduate academic training coupled with attractive prospects thereafter, enabled the University to draw the best of its graduates into its service. But it was the view of the bureaucracy that prevailed at the College.

The "Tech" Student

The students of the Technical College were selected for admission on the results of an entrance examination, and the annual intake was about 40. Those admitted fell into two general categories: the ones who had chosen engineering for their career and had entered the College straight from school, and those for whom engineering was the second option after they had failed to enter the University's Physical Sciences Courses or had failed the University's First Examination - then known as Qualifying Examination - in Science. There was also a small group admitted directly into the Second Year consisting of Science graduates and those who had passed the London Intermediate Examination in Engineering from outside. The average "Tech" student tended to be rather mature and hard-working. He was well aware of the deficiencies in the instruction at the College and of the high failure rate in the London examinations and learnt to be self-reliant. Although there was the usual amount of high-spirited fun at the College there was never any ragging of freshmen. There was a Students' Union which was dormant for many years, but came to life in the late 1940s due to the formation of a two-party system, not in any way related to the country's political grouping. The College

had no recreational facilities of any kind - not even table - tennis. The other national pastime - politics - did not find any place in a College where the preoccupation of the students was with academic survival in a bleak environment.

Crisis in Technical Education: Ailing College and Failing Students

In the immediate post-war years the Ceylon Technical College was able to render valuable service by providing the country's needs of engineers in spite of its operational difficulties regarding staff, equipment and courses. But a crisis erupted suddenly in Dec. 1949 when all Part II (Final Year) students who had sat the June 1949 Examination offering Surveying were failed in that subject. This meant failure in the whole examination as no Reference was granted in single subjects in the Part-II. It affected about 90% of the Civil Engineering students, the survivors being those who had opted for Mathematics in place of Surveying. The Directors of the Public Works Department and the Irrigation Department, where Civil Engineering graduates were employed in comparatively large numbers, were deeply concerned and representations were made to the Ministry of Education. It appeared that the College had been warned the previous year by the University of London, that the Course Work in Surveying was not up to the requisite standard in both quality and quantity. The College had taken some corrective measures but these had proved inadequate, and the University of London then took the drastic step of failing the entire group of students. It also transpired that the University of London had indicated its desire to reconsider its continued recognition of the College under the "New Regulations" governing the BSc(Eng), which had already come into effect in Britain. But the indications on the ground were that the College was not equipped to weather the storm. The size and quality of its staff and the state of its laboratories, it was felt, could not possibly survive scrutiny by a team of inspectors from the University of London.

The Advisory Committee of the Ceylon Technical College discussed this crisis at its meeting on 23 Feb. 1950 and decided to request the Minister of Education to "hand over" the degree courses to the University of Ceylon. In response to this recommendation the Minister wrote to the Vice-Chancellor on 28 Feb. and requested him to draw up proposals for a Faculty of Engineering, which would start functioning on 1 July 1950. The new Faculty would select freshmen from those sitting for a Special University Entrance Examination. The Second, Third and Fourth Years would be students from the Ceylon Technical College who would be able to complete their courses in the new Faculty of Engineering, but sit the London Examinations which were to continue until 1953.

Staff vacancies in the Faculty were advertised in April 1950 and the appointments announced in June 1950. The strength of the staff was 12, including two Professors. Due to its hurried establishment the Faculty of Engineering had neither buildings nor equipment. It had to be housed temporarily at the Ceylon Technical College until the Peradeniya buildings were ready. It also had to depend on the infrastructure of the College, supplementing the existing laboratory facilities with equipment of its own. This enforced, partial dependence on the Ceylon Technical College for a number of vital formative years has left its mark on many aspects of the Faculty development and organization.

Graduates from the Ceylon Technical College 1943 - 50

	1st	2nd	Pass	Total
1943	1	2	2	5
1944	0	3	4	7
1945	1	1	3	5
1946	0	3	3	6
1947	3	4	14	21
1948	2	11	10	23
1949	0	4	5	9
1950	3	12	13	28

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The "Old Tech" in retrospect

The number of engineers in public service in 1943 was about 210 and the Ceylon Technical College did well to contribute 104 graduates to the country in the next seven years. (There were also two other smaller streams flowing into this pool: those obtaining the charter of the professional institutions of London without graduation, and those promoted to the grade of Engineer by departmental examinations. It may be noted as a matter of interest that during this period there was a tendency in some government departments to prefer their own departmentally promoted non-graduates to graduates of the Technical College in Engineering appointments. But this attitude disappeared in the late 1940s with the changes at the top). If the London degree examinations had not been held in Ceylon it is not likely that more than 10% of this total of 104 would have had the private resources to go to Britain to enter Universities in those very difficult, war-affected years, 1943-50. The contribution of the Technical College has to be judged in this context and not solely by its shortcomings, and its failure to consolidate the valuable link established with a reputed University abroad.

It would have been evident to any one familiar with the engineering scene in the 1940s that the Ceylon Technical College was in distress. It was a tightly-controlled government institution, which was unable to attract competent teaching staff on account of the poor conditions of service and its poor public image. The decision of the University of London was a coup de grace or, according to some, an act of euthanasia. The college authorities were soon bracing themselves for an inquiry into the disaster but the event never took place. Perhaps the Ministry of Education knew the facts and preferred to let the dust settle rather than stir up a controversy.

The "Old Tech" has now passed into history. Most of the technical sections of the College were transferred to the Institute of Practical Technology at Katubedde in the 1960s. The Arts and Crafts unit had been moved out earlier to the "Heywood" School of Art, which was later renamed the Institute of Aesthetic Studies. Its engineering laboratory buildings have been demolished. The Administration Building and the Lecture Room Block remain, and the institution still bears the same name. But it is only a Commercial College.

3. THE PERADENIYA CAMPUS ENGINEERING FACULTY PROJECT

"It was the propinquity of industrialization which persuaded the University of Glasgow to establish a chair of Engineering in 1840. It was said to be the first chair of engineering in any British university. The Glasgow chair was set up by a royal warrant and was evidently not welcomed by the academics in the university; for the Senate refused to supply the first professor with a classroom until the Lord Advocate intervened on his behalf, and even as late as 1861 engineering was not 'considered a proper department in which a degree should be conferred' and the subject remained for many years in the Faculty of Arts."

Sir Eric Ashby (1958) (9)

Proposals for the Engineering Faculty

When the University of Ceylon was established in July 1942 it had been decided that it would be a residential University, and Peradeniya was selected as the location for all its Faculties. The Ministry of Education had no objection to the University having a Faculty of Engineering although a degree course was by this time being conducted at the Ceylon Technical College. In Oct. 1945 the University Council resolved that a Faculty of Engineering would be established in Peradeniya by 1948, which was also the date set for the transfer of the Faculty of Science to Peradeniya.

Delays in both the acquisition of land and the construction of buildings slowed down the project a great deal, and in a review made in 1947 it was decided to establish the Faculty in temporary buildings in Peradeniya in 1950. Due to further delays the date was again put off to 1952, but the site was selected by the Planning Consultant Sir Patrick Abercrombie. It was on the left bank of the Mahaweli, a block of land dominated by three small hillocks which would be

levelled down to about 1600 ft to provide an area of about 15 acres. Access to the land would be by a diversion of the Gampola Road, while a foot-bridge would be constructed across the river, close to the Senate Building, for pedestrians.

In the meantime the Ceylon Technical College was having the serious troubles alluded to with regard to teaching staff. In 1947 an offer of help came from the University which lent the College the services of Prof. E.O.E. Pereira, the newly appointed Professor of Civil Engineering. In the 6th Annual Report of the Council reference was made to this appointment as follows:

"As a member of the Faculty of Science and Senate the Professor will help to develop the plan for the Faculty of Engineering in Peradeniya....." (7)

The new Faculty was expected to have an annual intake of 25 students. But Prof. Pereira, in drawing up the plans in Sept. 1949, prepared them for a possible intake of 125 students, an academic staff of 20 teachers, and 25 Demonstrators (Instructors). Minor staff were estimated at 40 and there were to be about 25 labourers. His plans envisaged an Administration Building and 22 smaller buildings forming the laboratories, drawing offices, workshops etc. This complex was also to contain an Engineering Library, a Faculty Office, a Dean's office, staff rooms, a students' canteen, a minor employees' canteen etc - much as it is now. The total estimated floor area was 74,000 sq ft. The foot - bridge across the Mahaweli, and a certain number of houses for staff were also to be built under this scheme. The estimated cost was:

Buildings	Rs. 9 million
Equipment	Rs. 5 million

These proposals ran into opposition from the Vice-Chancellor, Sir Ivor Jennings, who thought they were extravagant and cost too much.

He had in mind a much smaller project in which there would be no Engineering Library - the books could be kept in the Main Library across the river. There was no need for a Faculty Office as the General Office in the Senate Building could handle much of the work - a small office room for a clerk would suffice. No separate office for the Dean as he could function from his personal departmental office. Only the Professors were to have separate rooms; Lecturers would have to be satisfied with common rooms. Canteens and lunch rooms were not necessary. The Vice-Chancellor envisaged a two-storey Administration Building and three or four simple buildings for Laboratories. After criticising Prof. Pereira's plans as being too vast, his letter to Prof. Pereira ends with the words:

".....It won't do. The Vice-Chancellor and the Professor of Civil Engineering will get hanged, drawn and quartered if this goes any further. Can you let me have a more modest scheme?" (10)

The Vice-Chancellor's problem was that the Cabinet had made a provision of only Rs. 3 million for what was regarded as a comparatively small Faculty having an annual intake of 25 students. He was therefore inclined to think of the immediate difficulties of Prof. Pereira's proposals rather than their future possibilities. He had also been influenced by what he had seen at two modest Engineering Colleges in India when he visited that country a little earlier. But Prof. Pereira was looking very much ahead to a time when the intake would be several times this figure and to a time when the staff and students would have to be provided with better working facilities than those acceptable in the austere, immediate post-war period. He insisted on these basic proposals tenaciously through years of argument, controversy and criticism until he won his case in June 1958 when a firm decision was made for a provision of Rs. 15 million in the University budget. By that time the intake was already about 60 and was to shoot up to 150 in 1964 when the transfer to Peradeniya was completed.

As the construction work in the Peradeniya University scheme progressed in the late 1940s with buildings for the Arts and Science Faculties, the Halls of Residence, General Office, Library, staff houses etc., the government became concerned at the escalating costs of the scheme as well as its delays. There were greater financial constraints as many development projects were planned after independence. To lower the costs in Peradeniya the architectural embellishments of the earlier designs were reduced and greater emphasis placed on utility. This change of style is quite evident in the designs of the later Halls of Residence, Akbar-Nell Hall (1964) being the last of the series. A review of the Engineering Faculty project was made by the Minister of Transport and Works (Sir John Kotelawela) at his office on 6 May 1951. Among those present were the Vice-Chancellor and the Dean/Engineering. The Minister wished to know whether it was not possible to abandon the Engineering part of the Peradeniya scheme and establish the Faculty at the Ceylon Technical College. The Vice-Chancellor explained why the Ceylon Technical College was not suitable, and that it was essential to the University project to have the Engineering Faculty in Peradeniya. The Dean/Engineering was then asked to re-examine his plans and cut down costs as much as possible.

These hesitations and doubts notwithstanding, the Permanent Secretary/Ministry of Education informed the Vice-Chancellor on 14 May 1951 of the Cabinet approval of the estimate of Rs. 14 million - Rs.9 million for buildings and Rs.5 million for equipment - for the Engineering Faculty Project.

A few months later, on 10 Sept. 1951, the Vice-Chancellor wrote to the Permanent Secretary that

".....These are not expensive buildings. The only building with any architectural pretensions will be the one academic building, which will contain lecture theatres, library, tutorial rooms and common rooms. The others will be simple

one-storey buildings. Indeed, I pointed out to the University Architect that the cattle-sheds at Bopatalawa, with some adaptation, will be quite suitable for our workshops....." (11)

The growing concern in the University and the Treasury about the escalating costs in Peradeniya appears to have led Sir Ivor Jennings to assure the government that the Engineering Faculty project would indeed be a low-cost one. There would be none of the costly architectural features in which "every traditional style of the Sinhalese architects, both in colour and mass, have been enshrined in the plans and elevations" (12).

(The term "workshops" has been used by some architects in its generic sense to denote all laboratories. In fact the present laboratory buildings were designated as "Workshops 1, 2 14, 14A" by the University Architect. The Applied Thermodynamics laboratory, for instance, was No. 13 and was labelled "Steam Power Workshop"!)

The new arguments about the site, 1953 -55

In Oct. 1952 the University Administration and the Faculty of Arts were moved from Colombo to Peradeniya. Construction work was still going on in the Campus, the Geography Block and the Library being far from complete. The Faculty of Engineering then moved its office and its classes from the Technical College to the vacated buildings at Thurstan road. The Faculty's office and staff rooms were located in Sampson's Bungalow. The students had their lectures at Thurstan Road from 8 - 12 noon and the laboratory classes were conducted at the Technical College from 1.30 - 4.30 p.m. This shuttling between Thurstan Road and the Technical College about three miles away, was hard on the staff and students but had to be endured until March 1964. During the eleven-year stay at Thurstan Road a number of temporary buildings were put up for classrooms, a Drawing Office, a Workshop and a High Voltage Laboratory. They were light, low- cost structures in which Dexion steelwork was used

extensively. But some of them have proved to be very durable and were in use by the University of Colombo until recently. New pieces of equipment for the Faculty, for which there was no room in the Technical College laboratories, were installed in some of these buildings.

As the Faculty settled in at Thurstan Road fresh arguments about the site were raised. This was because the financial situation in the country had become gloomy and the necessary funds were not forthcoming. The Dean held the view that there were many advantages in having the Faculty at Thurstan Road, where the additional buildings that would become vacant by the impending transfer of the Faculty of Science could be used, together with new buildings that would be specially designed for engineering laboratories. Alternatively, the Faculty could even be located elsewhere, in the suburbs of Colombo. The date of the transfer of the Faculty of Science, however, underwent several postponements. By the time its construction work in Peradeniya was finally completed in 1962 the demand for science education was so great that, it became the Second Faculty of Science, with the Colombo Faculty remaining as it was. In the meantime, the Engineering Faculty's problem had been resolved by the University Council in June 1958 by a firm decision acceptable to all parties to the original controversy.

American Aid : The U.S.O.M. Proposals

In Jan. 1955 Sir Ivor Jennings retired and was succeeded as Vice-Chancellor by Sir Nicholas Attygalle. A man cast in a different mould, he was determined to get things moving, and transfer the Faculty of Engineering to Peradeniya at an early date, even if it meant housing it in temporary buildings in the Campus. At this point an offer of assistance came from the United States Operations Mission (USOM) in Ceylon. The value of this aid was Rs. 5 million. Of this about 20% would be spent in the consultancy services of academic personnel from the Agricultural and Mechanical College, College Station, Texas, U.S.A., generally known as Texas A & M, for

training local personnel and for visits of the Faculty academic staff to the U.S.. Four million rupees was thus available for the project itself, which included the foot-bridge across the river. Part of the aid was in the form of building materials - structural steel, window casements etc. - which can be seen in many of the buildings today. This aid programme was linked to a somewhat similar project in the Faculty of Agriculture and Veterinary Science, the consultants to which also came from the same Texas A & M College.

To this Rs. 4 million was added the University's counterpart contribution of Rs. 1.6 million. This reduced budget required a scaling down of the project. In April 1956, at the request of the Vice-Chancellor, Prof. Pereira revised his estimates for the project and submitted his new proposals. They were Rs. 7 million for buildings and Rs. 4 million for equipment. But the large gap still remained between the Rs. 11 million requested and the Rs. 5.6 million available.

The Rs. 5.6 million project mooted by the Vice-Chancellor involved big cuts in the sizes of laboratories and lecture theatres planned earlier; the large lecture theatre (Auditorium) was to be dropped. While the arguments were going on about the shape and size of the project three American consultants - Professors of Physics, Electrical Engineering and Mechanical Engineering from the Texas A & M - arrived and were accommodated in the Faculty premises in Colombo. In consultation with Faculty staff they set about placing orders for basic laboratory equipment, which were quickly put to use at the Faculty premises and at the Technical College laboratories.

The truncated plans drawn up to suit the new budget, prepared by the University Architect, were ready in July 1957 but the Dean refused to sign them. The Vice-Chancellor then announced his intention of going ahead with the construction work, even without the co-operation of the Dean and the Faculty. While the bulldozers were engaged in levelling operations at the Peradeniya building site, the Vice-Chancellor was preparing to bulldoze his way against mounting

opposition from the Dean and the staff.

Heard but not heeded : Resignation of Prof. Pereira

The controversy over the new plans for the Faculty project came to a head when Prof. Pereira submitted his resignation from the University in Nov. 1957. This resignation was discussed at the 129th meeting of the Council on 15 Nov. 1957, and it was decided to ask the Vice-Chancellor and two members of the Council (Mr. Dudley Senanayake and Dr. N.M. Perera) to discuss the resignation with Prof. Pereira, and find out what his grievances were. The report of this Committee advised the Council to call for a comprehensive set of proposals from Prof. Pereira and submit them to a committee of Ceylonese engineering specialists. Accordingly the Council decided at its 130th meeting on 13 Dec. 1957 to refer the proposals to a Committee consisting of Messrs H.R. Premaratne, D.W.R. Kahawita, B.D. Rampala and E.C. Fernando, who were very senior members of the profession. Two of them were Civil Engineers, one Mechanical and one Electrical.

The plans submitted by Prof. Pereira were for an annual intake of 125 although the actual intake at that time was about 60. The estimated cost of buildings was Rs. 10 million and equipment Rs. 5 million. The Committee was asked to consider:

- "(a) whether the plans conform to the minimum requirements for teaching up to London standards,
- (b) whether the expenditure cannot be reduced without affecting standards, and
- (c) whether the expenditure was necessary, sufficient or excessive"(13)

This Committee submitted a detailed report on 28 April 1958 and its main conclusions were:

- "(a) The plans and equipment conform to the immediate requirements of the Faculty of Engineering.
- (b) The costs of the buildings, such as the Administration Block, are excessive compared to the current rates.
- (c) The expenditure on the academic buildings are necessary. The requirements are not, in any way excessive."

In regard to the laboratories the Committee said : ".....If at all we consider the plans so far proposed to be on the small side, though there is provision for future expansion"

This report was accepted by the University Council on 9 May 1958, (14) and on 14 May 1958 the Vice-Chancellor wrote to the Director of Public Works to go ahead with the project using Prof. Pereira's plans together with the modifications recommended by the Committee. The detailed working plans were to be prepared by the University Architect Mr. T.N. Wynne-Jones. The way was clear at last.

In planning the construction work for the University Scheme the Public Works Department had accepted a general recommendation of the Planning Consultant Sir Patrick Abercrombie that as many as possible of the existing trees must be saved. To ensure this "every existing tree or plant had been noted on the plan and no unnecessary felling or clearing was done" (12). On the Engineering Faculty site, however, only one tree could be saved as the earthwork had been extensive and very deep. This tree can be seen on the lawn in front of the Administration Building of the Faculty.

The lay-out of the Engineering Faculty Project

In the early discussions of the project, long before the arguments about costs, it had been decided to level down the hilly site and

construct all buildings on flat ground. Two lay-out plans were prepared in 1959 and one of them was selected. It consisted of centrally placed Administration Building facing Gampola Road. With a 300 ft forecourt and a 20 ft drop to the main road, the motor vehicles on the road would neither be seen nor heard. The noise level was important because the Engineering Library was on the first floor of this building. Connected to the Administration Building and located behind it were the Dual Lecture Theatre and the Large Lecture Theatre (The Auditorium) - now called the E.O.E. Pereira Theatre. Four laboratory buildings - Electrical Engineering, Soil Mechanics & Surveying, Materials & Structures and Fluid Mechanics - and the two Drawing Offices were of identical structural design, being built around the steelwork supplied under the United States aid programme. The main structural component of these buildings is a pitched portal frame, fabricated in two sections, the ridge connection being made at the site. The elimination of the traditional heavy roof trusses gives these buildings an air of spaciousness which is one of the attractive features of the design. The Mechanical Engineering Laboratory, Workshop I, Workshop II and the High Voltage Laboratory were of different designs. The short corridor which links the main laboratory corridor and the Administration Block was introduced at a later stage. All the original buildings were constructed on cut ground, the exception being the Electrical Engineering Laboratory part of which is on fill, reinforced by piling.

The bridge across the Mahaweli was a widely discussed subject, and some interested groups were keen that it should be made big enough to carry vehicular traffic. The idea of a suspension bridge was dropped at an early stage, and the choice fell on a pre-stressed, footbridge. A design submitted by Messrs Husband & Co of England was accepted, and work commenced in 1960. The main load-carrying beams of the bridge are of pre-stressed concrete, post-tensioned using the Gifford-Udall system. Its centre span which is 200 ft, comprises two cantilever sections of 40 ft each, and a suspended span of 120 ft. The bridge has a total length of 530 ft, and a width of 9 ft. All pier foundations are based on bed-rock, while the

abutments, which do not carry any load coming from the bridge, are based on soil layers. There are four piers and under normal conditions the river water flows between the two inner piers. For aesthetic reasons the main beams have been given a gentle curvature. Messrs Walker, Sons & Co Ltd were the local contractors for the construction, and supervision was provided by the Public Works Department. The cost of the bridge was approximately Rs.800,000.

The original date for the completion of the construction work was 1962 but, as with the entire Campus scheme, there were delays. Construction methods were slow, and the extensive use of manual labour had once led an exasperated Sir Ivor Jennings to observe that it was "probably the last University in the world to be built by hand." The move to Peradeniya from Colombo finally took place in April 1964 and it was fortunate that the long vacation that year was of six months duration. This change was made so that the University may begin the Academic Year on 1 Oct., instead of the usual 1 July, and fall in line with the Universities of the northern hemisphere. It gave the Faculty staff enough time to install the priority items of laboratory and workshop equipment and settle down in the permanent home. A home at last! At the time of the transfer to Peradeniya in 1964 the floor-space available was distributed as follows:

General Office	9,140 sq ft
Library	9,375 sq ft
Lecture Theatres and	
Tutorial Rooms	17,085 sq ft
Drawing Offices	26,400 sq ft
Laboratories	84,000 sq ft
Workshops	15,000 sq ft
Total	161,000 sq ft

Details are given in Appendix I

Not included in this are staff rooms, canteens for students and minor employees, two garages, two lavatory blocks and a small electrical sub-station.

The Ceylon Technical College had a total laboratory floor area of 15,560 sq ft and the Faculty was getting 5.4 times that figure. However, there was not much to be jubilant about because the intake, which had been increased to 110 in 1961 "in anticipation of the move to Peradeniya" was raised again, after the move was completed, to 150 - a far-cry from the 1949 plans of 74,000 sq ft for an intake of 25. No amount of careful academic planning could provide for such large and arbitrary increases of intake. Situations such as this call for the replacement of planning by crystal-gazing.

Housing for staff

The allocation of Rs. 10 million for buildings included housing for staff and a Hall of Residence. The Akbar-Nell Hall was duly built and occupied by students. But there was a great deal of dissatisfaction and argument over the allocation of Engineering Faculty houses to staff of other Faculties. A total number of 66 houses had been constructed under the Engineering Faculty scheme (15), the categories being:

B	(3500 sq ft)	3
C	(2800 sq ft)	13
D	(2000 sq ft)	12
E	(1000 sq ft)	8
F	(550 sq ft)	30

In 1962, two years before the move to Peradeniya, the Dean had been complaining about the "temporary" allocation of Engineering houses to staff of other Faculties. He expressed his fears that the houses may not be returned. The Vice-Chancellor replied:

"..... The bungalows for the Engineering Faculty have been temporarily occupied by members of the Science and Medical

Faculties. You may remember that bungalows for the Science Faculty have been occupied by the Arts Faculty people. When the members of the Engineering Faculty move to Peradeniya a re-allocation of houses will take place" (16)

However, when the move to Peradeniya took place in 1964, the Vice-Chancellor's assurances were not honoured. He offered the Faculty only 24 houses (17), their particulars being

B	3
D	6
E	6
F	9

This led to more arguments, and a few more houses were allocated as and when they fell vacant. Due to many complaints about the arbitrary nature of the allocation of houses a Staff Residence Committee was soon formed, and a point-scheme was drafted, to ensure fair play to all employees. Under this scheme the Engineering staff were given 20 additional points.

The Project and after

The success in the long drawn out struggle over buildings and equipment had some unforeseen consequences. For many years to come the Faculty's requests for new funds - even for small development projects - were turned down on the grounds that a very substantial investment had already been made in the Faculty of Engineering and that there were other Faculties in greater need of money. The same argument would also be heard when the Faculty's requests for funds for the new Departments of Production Engineering, Chemical Engineering and Agricultural Engineering were submitted.

When the Faculty of Engineering was established its academic staff was entirely Ceylonese. Although only a few of them had

post-graduate degrees, there was never any doubt that, if the funds were provided, planning and construction of the new buildings for the Faculty and the equipping of the laboratories could be executed by the staff, without any expatriate assistance. This has not been the general picture in other parts of the world, however. Many countries in Asia and Africa, emerging from colonial rule, have had to depend, very heavily, on expatriate expertise to set up their Engineering Colleges, and to run them for some years before their own nationals could take over.

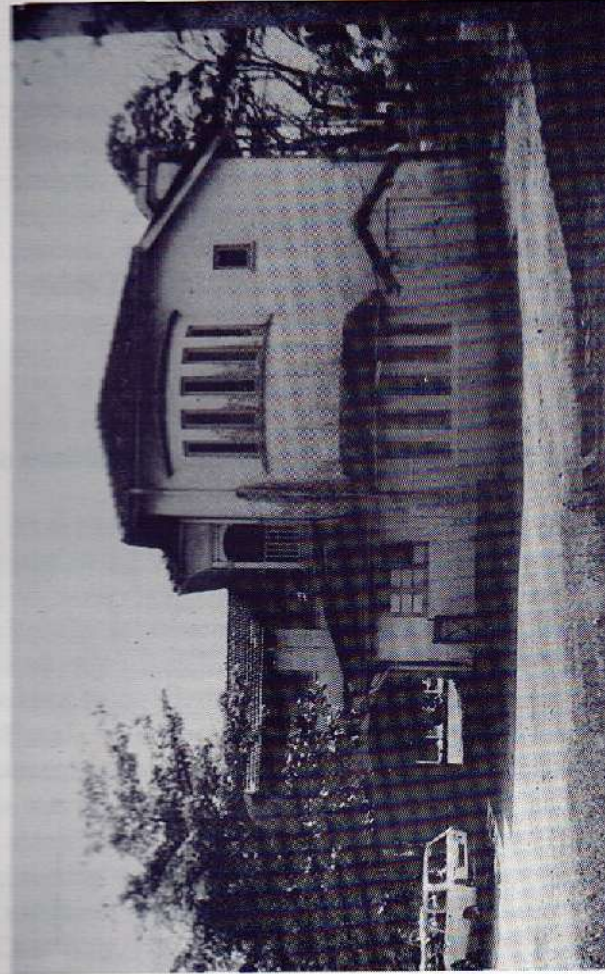


Fig. 2. A recent photograph of Sampson's Bungalow which housed the Engineering Faculty Offices, 1952-64 ; the rear portion has been demolished.

4. FACULTY OF ENGINEERING : THE COLOMBO YEARS 1950 - 64

"Experimental observations, uncontrolled by mathematical analysis, seldom lead to conclusions of permanent value, and this problem of bridge impact, like all great problems in engineering science, calls for a close cooperation between mathematical analysis and practical experiment. Mathematical analysis is required to indicate the lines along which the experiment should proceed, and experiment, in its turn, is necessary to check the validity of theoretical predictions and to prevent mathematics running off the scent and barking, so to speak, up the wrong tree."

Sir Charles Inglis (1934) (18)

The establishment of the Faculty of Engineering.

At the commencement of its first academic year on 1 July 1950 the total strength of the teaching staff of the Faculty of Engineering was 12, comprising Civil Engineering 7, Electrical Engineering 3 and Mechanical Engineering 2. The Chair of Civil Engineering had been held by Prof. E.O.E. Pereira since 1947 and Mr. R.H. Paul was appointed to the Chair of Electrical Engineering in the recruitment of staff made in June 1950. The Chair of Mechanical Engineering, however, was not filled due to the lack of applicants for this position. This was the only unfilled post in the Faculty and would remain so for many years. Included in the staff of the Department of Civil Engineering was an Assistant Lecturer in Engineering Mathematics. An additional Assistant Lecturer was also appointed to the Department of Chemistry, Faculty of Science, to specialize in Metallurgy, which was planned to become part of the expanded subject of Strength & Elasticity of Materials. Due to the very short notice given to the newly appointed staff only six of them were in a position to assume duties on the first day. The others were abroad and would join the team later. With the exception of a single Assistant Lecturer, an

expatriate product of the Ceylon Technical College, who resigned after a few months, all the appointees were Ceylonese who had been associated with Engineering education either in Ceylon or abroad. Some had, in fact, been associated with the pioneering work at the Technical College. The only Lecturer in Mechanical Engineering was a Ceylonese who had been on the staff of an Engineering College in India. Thus there were eleven engineers in the original team of twelve. A number of them had been in the field for several years as professional engineers, while the younger ones were yet to obtain their charters. It was expected that all the younger staff would complete their professional training and become chartered Engineers of one or more of the British professional institutions. Within a few years all but one of the eleven had obtained these qualifications. At the inception only three staff members had higher degrees: one PhD and two MSc(Eng). The names of staff members who had served as Deans, Heads of Departments, Professors, Lecturers etc.. during the period 1950 - 71 are given in Appendices II and III.

The salary scales set out in the advertisement of the staff vacancies were higher than those paid to teachers in the Faculty of Science, and the Engineering Professors were paid an allowance of 25% of their basic salaries as an allowance in lieu of private practice. As an inducement to prospective applicants the basic salary of an Assistant Lecturer was made about five increments higher than the starting salary of his counterpart in public service. Even the Temporary Instructors were paid a salary higher than the starting salary for engineers in public service. The University, however, did not honour its commitment to implement these salary scales later on. This first transpired when some of the Assistant Lecturers recruited in 1950, on being promoted to Lectureships in 1955, were placed on the lower "Science Scale". It caused a great deal of resentment and acrimony and soured the relationship between the Faculty staff and the new Vice-Chancellor Sir Nicholas Attygalle for nine years. The issue was finally settled in favour of the lecturers concerned when the University Court took up the problem in 1964.

The staff of the new Faculty were at first accommodated in three rooms at the Ceylon Technical College, one of which served as the Dean's room as well as the Faculty Office. At that time the Technical College building complex was smaller than it is now, and class-room, laboratory and office space were very short. Sir Ivor Jennings, the Vice-Chancellor, after a brief visit to the College, remarked that the Faculty of Engineering was temporarily housed in premises where "there wasn't enough room to swing a cat".

To start with the Faculty of Engineering was linked to the Faculty of Science, and Prof. E.O.E. Pereira officiated as the administrative head. This was only a temporary arrangement. The Faculty became an independent body a few months later when the Inaugural Faculty Meeting was held on 16 March 1951, and Prof. Pereira was elected Dean.

Lectures and Laboratory Classes in the early years.

The first few months of the Faculty were very difficult ones indeed. There were three comparatively large batches of students, 189 in all, who had come over from the Technical College. The Faculty's own First Year class had 25 students and was accommodated at Thurstan Road. These students had been selected from candidates who sat a Special Entrance Examination held in May 1950 and from others who had been admitted for Science in the Dec. 1949 Entrance Examination but who wished to do Engineering. This First Year group followed what was essentially a Science Course together with Workshop Practice at the Technical College. In some subsequent years the freshmen were also given 2 - 3 months industrial training before entering the Faculty. Engineering Drawing, which had been a first year subject in the Technical College, was moved up to the second year and it now became a Part I subject. This move eased the pressure on space at the Technical College and also saved the time the students spent in shuttling between Thurstan Road and Maradana.

The Second, Third and Fourth Year students, who were originally Technical College students, continued to follow the schedules designed for the London examinations. It was therefore convenient to retain the Technical College arrangements of laboratory classes and time tables. The part-time services of some of the academic staff of the College were obtained in the early months to meet the immediate shortage of teachers; the assistance of their laboratory personnel was required for a much longer period - in fact, till the move to Peradeniya took place in 1964. A certain amount of friction was inevitable in a joint operation of this kind but since the College staff were all being paid for their services complaints as did arise were not serious.

The grouping of subjects of study in the Faculty was as follows.

- Civil Engineering : Theory of Structures; Strength of Materials (with Metallurgy); Mechanics of Fluids; Surveying; Engineering Mathematics.
- Electrical Engineering : Electrical Power; Electrical Measurements; Telecommunications; Applied Electricity.
- Mechanical Engineering : Applied Thermodynamics, Theory of Machines; Engineering Drawing.

A point of interest here is that regular courses in Theory of Machines and Telecommunications were now available at the Part II level. The Ceylon Technical College had never been able to provide a Part II course in the former subject, while a course in the latter had been available for one year only.

Workshop Practice

Students entering the Faculty of Engineering have been generally found to be lacking in exposure to technology at school level; there

were some who would have been reluctant to use their hands in a practical way even if the opportunities had been there. It was the Faculty view that a good course of Workshop Practice, together with some industrial training, would help to correct this deficiency. Prof. Pereira had a keen interest in this problem and took charge of the setting up of the Workshop and the design of the training programme. In an article for the Faculty's Silver Jubilee celebrations in 1975 he wrote:

"At the outset, the urgent need for workshop classes was recognized, not for the purpose of turning our students into mechanics and artisans, but with the sole object of disabusing their minds of a pernicious notion held by them, perhaps a relic of the old caste system, that it was degrading and beneath one's dignity to work with one's hands. I am glad to say that the workshop course has proved a most effective corrective. The eradication of the superiority complex and an appreciation by the students of the dignity of labour have been matters of the greatest importance and significance in the education of engineers at university level." (19)

The Courses of Study and the Scheme of Examinations

The internal degree course of the University of London took three years and the examinations were held at the end of each year. They were called the Intermediate Examination in Engineering, the B Sc (Engineering) Part I and Part II. The form of the London external degree course in British Technical Colleges was variable because some of their students were from Industry and were registered for part-time studies. The Ceylon Technical College course was a full-time "day-course" in which the London syllabus was spread over four years to make up for the shortcomings of both the students as well as the College courses. The Intermediate Examination was held at the end of the first year course which was called "Intermediate A". The Part I course took six terms, of which the Second Year, for want of a suitable name, was called "Intermediate B". The Third Year was

called Part I and the Fourth Year Part II. The entire scheme was governed by the "London Old Regulations". (The term "Old" was used because a "New Regulations" scheme came into effect in Britain in the late 1940s. Due to cessation of the degree course at the Technical College in 1950, the "New Regulations" were never followed in Ceylon.)

The Intermediate Examination consisted of the following papers:

Written Papers on

1. Pure Mathematics
2. Applied Mathematics
3. Heat, Electricity & Magnetism
4. Sound & Optics
5. Engineering Drawing (2 papers)
6. Chemistry (optional)

with Practical Examinations in

1. Heat, Electricity & Magnetism
2. Sound & Optics
3. Applied Mathematics
4. Chemistry (optional)

Each written paper was of three hours duration, with the exception of Engineering Drawing I which took four hours. The practical tests were also of three-hour duration.

Part I

In the examination for the Part I the candidates sat for one three-hour paper in each of five compulsory subjects:

1. Strength of Materials & Theory of Structures
2. Theory of Machines
3. Applied Heat & Mechanics of Fluids
4. Applied Electricity
5. Mathematics

There was Course Work in all subjects with the exception of Mathematics.

Part II

The Part II examination comprised four options from the following list, with two three-hour papers in each option.

1. Strength & Elasticity of Materials
2. Mechanics of Fluids
3. Theory of Structures
4. Surveying
5. Electrical Power
6. Electrical Measurements & Measuring Instruments
7. Telecommunications
8. Applied Thermodynamics
9. Theory of Machines
10. Mathematics

There was supporting Course Work in all subjects with the exception of Mathematics.

One special feature of the London External Examination scheme was the fact that to be eligible for Honours a candidate did not have to complete the course in a specified (minimum) period. The reason was that most of the external candidates came from British Technical Colleges where the length of courses varied, some candidates being part-time students from Industry. Although the Ceylon Technical College had a full-time, four-year course, some of its students benefited from this generous provision, and were able to get Honours even though they had taken more than four years to obtain the degree.

In drawing up its own courses of study and the examination scheme the Faculty was subject to several constraints. It was a new Faculty, under-staffed in its early years, with no great depth of experience in teaching and examining at university level. At the

inception only three of the teachers had post-graduate degrees. And it had no laboratories of its own, being dependent on the Ceylon Technical College until the move to Peradeniya. All these factors led to the adoption of a modified form of the University of London scheme with which most of the teachers were familiar. This would also enable the Faculty to seek early recognition by the three major professional engineering institutions in Britain. It was decided that a major re-examination of the teaching programme would take place after the Faculty had stabilised itself in Peradeniya. In the meantime individual staff members were free to up-date and extend their syllabuses at their discretion without waiting for the formal revision.

In modifying the London scheme the First Year Examination was named "First Examination in Engineering" although it was very much a "Science" Course. This change also brought the nomenclature in line with that used in the other Faculties. Engineering Drawing was moved up into the Second Year and formed Section A of the Part I Examination with a single four-hour paper. Section B consisted of seven compulsory subjects with one three-hour paper in each subject.

Part I (5 terms)

Section A

1. Engineering Drawing

Section B

1. Strength of Materials & Theory of Structures
2. Theory of Machines
3. Applied Heat
4. Mechanics of Fluids
5. Applied Electricity
6. Surveying
7. Mathematics

There was Course Work in all subjects with the exception of Mathematics.

Part II (4 terms)

The subjects for Part II were the same as those in the London "Old Regulations" and a candidate was required to offer four subjects taking two three-hour papers in each subject. Later on candidates were allowed to offer five subjects if they so desired, the best four marks being taken for the award of honours. Reference was granted in one subject in Part I, but not in Part II.

The changes made to the London Old Regulations scheme were: Engineering Drawing was moved up to Part I as had been done by the University of London in the New Regulations, but separated from the main examination as "Section A". In view of the general weakness that prevailed among the students in Engineering Drawing this provision was made for a failing student to be referred in that subject, without it having any adverse effects on his overall grading for the rest of the Part I subjects. Surveying was introduced into Part I as the view was held that a knowledge of this subject was a necessary equipment for all categories of engineers, not only Civil. (It had also been a subject in Part I in the Technical College course, although there was no London examination in it.)

The Part I Examination was held after five terms. An examination in the middle of the academic year had its drawbacks; for instance, the setting of papers, marking of scripts etc. tended to hinder the smooth flow of term-time activity.

The formally accepted abbreviation of the degree of "Bachelor of the Science of Engineering" was "BSc Eng", the brackets being dropped from the style favoured by the University of London.

Planning of University courses

In the Calendar 1963-64 and 1964-65, the last calendar published by the University of Ceylon, the "Aims of the University" have been set out in detail, and the student was advised to bear in mind that

"the specialist must certainly know more and more about less and less, but he must also know more and more about more and more if he is to make use of his specialized knowledge." (20)

The tremendous growth of Science and Technology in the last half-century has produced "more and more" knowledge essential to our society. The planner and teacher of a university course is thus confronted by the problem of what to teach and what to let the student learn by himself. It is a problem that will grow more and more acute with time, and an eminent academic, Professor Sir Derman Christopherson, has described the pressures that universities and engineering colleges have to face in consequence :

"The basic contradiction in the education of the engineer on the academic side at the present time can be stated very simply. The scientific and technical knowledge which, without any doubt, would be of value to him in his profession, has at least doubled in the last twenty five years, but the time available for his education has remained unchanged. Indeed such is the pressure on most institutions of higher education just now that it would be difficult in practice to lengthen courses, even if it were decided in principle to do so.

In the circumstances Colleges and Universities have been forced to adopt a number of palliative measures, none of them very desirable, in order to maintain the appearance of providing a comprehensive course. Among the palliatives are raising the standard of admission, crowding the time-table, pruning the syllabus and increasing specialization." (21)

These observations were made in 1961 but they are just as valid to-day.

Changes in the examination structure.

In 1960 the University academic bodies considered a suggestion for a change in the grading scheme in all the Final Examinations by splitting the Second Class into Upper and Lower Divisions, as some British Universities were already doing. This measure was accepted by the Senate and implemented at and after the 1960 examination.

An important feature common to both the Faculty's examination structure and that of the University of London's, was the stipulation that Honours and Pass candidates were examined on the same Part II question papers. In the early years some thought was given to the possibility of having separate courses and separate papers for the two groups of candidates, as was being done by some British Universities. Finally a compromise was effected in which five subjects were made mandatory for Honours candidates, while Pass candidates continued with four, the individual courses and examination papers remaining the same for both categories. This change in the Regulations was introduced in 1966.

No other changes were made until 1971 when, with a complete revision of syllabus, a three-part examination scheme was introduced under the "New Regulations".

External Examiners

The assistance of the Academic Registrar of the University of London was sought in 1950 to obtain the services of External Examiners. Those recommended by him were experienced teachers some of whom were well known from being listed by name in the question papers of the University of London. The rates of payment to these examiners for their services were comparable to those paid in London and the arrangement was entirely satisfactory. When an

Examiner retired he usually nominated his successor. The Examiners took a great deal of trouble to scrutinize the papers and check the solutions, and their detailed comments were found to be very valuable indeed. Since the Faculty staff had very little experience of examination management at that time, this guidance was very salutary and most welcome. The question papers and answer scripts were sent by air and they were returned without delay.

It is unfortunate that the External Examiner system has been weakened over the years for financial and other reasons. Some of the newly-independent countries like Malaysia, Singapore and the African States have a more elaborate scheme in which each External Examiner visits the University once in three years. This scheme costs more money but is of greater benefit to the internal examiners, and also provides an incentive to the External. The personal contact achieved by this arrangement can do much good to an inbred academic community. The present rates of payment are so poor that it is surprising that we are able to retain the few British external examiners who are still on the panel. As time goes on the Faculty will have to depend more and more on Sri Lankans abroad - many of them former staff members - to act as external examiners.

Organisation of the Examinations

When the University of London held its external examinations in Ceylon the time tables were the same as those in Britain, with morning and afternoon papers. The Part I examination which had five subjects was finished in two and a half days - just half a week! The Part II Examination, where provision had to be made for various combinations of subjects, took about two weeks, with morning and afternoon papers. Most Universities in the world have their examinations in the last month of the final term and the results are usually announced before the commencement of the long vacation. In the London external examinations held in Ceylon, however, there were special problems of distance. The answer scripts and the Course Work submitted by students were sent by sea, and took about

two months to reach London. The results, which were printed in the University's formal style, came by air along with the candidates' performance details, examiners' reports etc., and were released in Ceylon about four months after the examination.

When the Faculty started holding its own examinations time was given to students, after the end of term, to prepare for the examinations and also to complete their Course Work. Over the years the examination time tables were also stretched out so that there were only morning papers and none in the afternoons. The examination activities were thus spread out over the entire long vacation so that by the time the last of the papers was over, the new academic year was about to begin. Some internal examiners took their own time over the marking and in consequence the benefits of sending the answer scripts to the External Examiners in Britain by Air Freight were lost. The results were usually announced 3-4 months after the examination, taking just as long as the London examinations. With the diminishing of staff strength and the steady increase of examination load on teachers over the years this waiting period had grown much longer, and a few years ago it took about nine months. It has now been reduced to about 4-5 months. Perhaps if the Faculty had held a tight rein on the staff and students in the scheduling of examinations and the marking of scripts, a good tradition may have been established in those early days when student numbers were small and discipline was easier to maintain.

Post-graduate Scholarships without tears.

With the graduation of the Faculty's inaugural year students steps were taken to revive the government - funded post-graduate scholarship scheme for training overseas, which had languished unutilized since 1947. The harsh restrictions imposed by the Ceylon Technical College authorities, which had not done anybody any good, were removed and the scholars were permitted to choose the kind of post-graduate training they wanted. This was of course how such scholarships had been awarded since the days of the University

College. Although the Technical College scheme had three Engineering scholarships per year it was now reduced to one, in keeping with the number of awards made in the other Faculties of the University. The first award was made in 1954. If a scholar was already a Probationary Assistant Lecturer in the Faculty he was expected to obtain his higher degree in one of the fields required by his Department. Otherwise the scholars were free to choose the training they wanted.

Post-graduate training for academic staff

There was only one PhD and two MSc (Eng) on the staff appointed in June 1950. In the country itself there were very few professional engineers outside the University who had post-graduate degrees and who could be invited to serve as Visiting Lecturers. Since the Faculty was in urgent need of specialist lecturers, the Assistant Lecturers had to be sent abroad as soon as possible for post-graduate work. There was of course the difficulty of finding substitute staff or visiting lecturers for performing duties during their absence. To ease the situation some of the senior staff volunteered to carry heavier teaching loads, and the University was also able to obtain some lecturers from India on contract. Three Assistant Lecturers were sent abroad in 1952, one in 1953 and one in 1954. The fields of study were Mechanics of Fluids, Telecommunications, Applied Mechanics, Electrical Power (High Voltage) and Applied Mathematics (Fluid Flow).

The probationary study leave period was three years, with a few months of no-pay leave added if it happened to be necessary to complete the research programme. The regulations in British Universities at that time laid down a period of two years as the minimum for the Ph D, and some of the Assistant Lecturers were able to finish their work in less than the three years granted and use the rest of their leave to obtain field/industrial training.

In the period 1952-55, when most of the Assistant Lecturers were on leave, the Faculty's meagre manpower resources were fully stretched, and great demands were made on those holding the fort.

The London Examinations and the period of transition

The three batches of students, who were taken over from the Ceylon Technical College, formed the Second, Third and Fourth year classes in 1950, and they were due to sit the London examinations. The University of London informed the Faculty that under the "Old Regulations" the Part I would be held in 1951 only, while the Part II would be held in 1951, 1952 and 1953. The candidates for these examinations included students attending courses in the Faculty as well as those who had completed the courses conducted by the Technical College earlier but had not passed the London examinations.

The results of the 1951, 1952 and 1953 Part II London examinations were :

	1st	2nd	Pass	Total
1951	2	7	13	22
1952	3	13	29	45
1953	0	7	18	25

The 1953 Part II examination brought to an end the ten-year link with the University of London which had been of such vital importance in the development of engineering education in Ceylon.

Examinations in the Faculty of Engineering

The Second Year class of 1950, who had come from the Ceylon Technical College, were in a special category as there would be no more Part I London Examinations for them when they completed that course in 1952. They were therefore allowed to sit the University of Ceylon's Final Examinations since they had already passed the

Intermediate Examination of London, which was the equivalent of the First Examination in Engineering. This group of students sat the University of Ceylon Part II in 1953 and the results were :

	1st	2nd	Pass	Total
1953	1	3	2	6

The wastage from this batch had been particularly heavy. In 1954 the Faculty's own first batch of students sat the Final Part II together with the repeating candidates of the previous year and the results were:

	1st	2nd	Pass	Total
1954	6	5	11	22

Statistics of graduates of the Faculty are given in Appendix IV.

Admissions, planned and unplanned.

In spite of the prestige of the degree of the University of London, the training for a profession and good prospects of employment, admission to the Technical College had not attracted as much public interest and demand as that to the University of Ceylon. This may have been partly due to the poor public image created in the pre-war years when employment prospects for engineering graduates had been bleak. The College had its own entrance examination and the annual intake in the period 1946-50 was about 40 but the wastage was generally heavy. The main causes for this were the poor quality of some of the students and the inadequacies of the instruction at the college. The University of Ceylon's Entrance Examination had generally attracted the best students in the country, and since its inception in 1950, the Faculty has had the best of the Physical Sciences students. Analysis of the numbers of engineers in public service during the period 1930-50 revealed that the need for Engineers in the country was about 25 per year, and the intake of students into the Faculty was fixed at this figure. It was entirely a Faculty decision. Generally the politicians and parents felt that this

was too low, and no doubt some of them would have preferred no ceiling at all. For the first six years the intake remained at 25, despite the pressures in Parliament, the press and from interested groups. From 1956, when the intake was raised to 60, the Faculty's views on the intake were never sought and the numbers have been going up ever since as is seen in the following table.

Year	Admissions
1950-55	25*
1956	60
1957	75
1958	67
1959	72
1960	68
1961	111 (2)
1962	104 (0)
1963	137 (6)
1964	150 (2)
1965	169 (29)
1966	152**
1967-78	150
1979	250

* First year in the Faculty of Science

** First year in the Faculty of Engineering

The figures in the first column give the total number of admissions. During the period 1961-65 some of these students were admitted directly into the Second Year and their numbers are given within brackets in the second column.

As noted earlier the large increase in 1961 was made "in anticipation of the removal of the Faculty to Peradeniya in 1962" as the official statement put it. But the transfer was delayed and finally took place two years later in 1964, and the arrival in Peradeniya was seized upon as the pretext for yet another increase, making the intake

150. The staff of the Faculty of Engineering had always argued against such unplanned increases, imposed on them by the University authorities without any preparatory provision by way of additional staff, space and facilities, but their warnings passed unheeded. The next such increase was to come in 1979 when the intake would be raised to 250 by the UGC at a time when there was actually a proposal from the Faculty that the intake be lowered in view of the depletion of staff strength. However, the Faculty was persuaded into acceptance with promises of additional staff and additional funds for buildings, equipment, books etc. Regrettably these promises were not honoured.

In the early years of the University of Ceylon the admission to the science-based courses was made on the results of a University Entrance Examination in which there were written examinations, practical tests and interviews. In 1950 this was converted into a Public Examination called the Preliminary Examination, for which a certificate was issued. This change was made to help those students who wished to have a recognised certificate to support applications for places in foreign universities. An Engineering Section was included in the Preliminary Examination in 1951 and the interview was an important part of the examination. The Dean and Heads of Departments were on the Interview Board and the general observation was that many of the candidates interviewed were more suited to Science than to Engineering.

A major change was made in 1964 when the General Certificate of Education (Advanced Level) Examination was introduced as the common entrance examination for all three Universities, and the responsibility for conducting the examination was taken over by the Ministry of Education. The examination authority was the Commissioner of Examinations, assisted by a Board consisting of representatives of the Universities and the Ministry of Education. The Entrance Interviews were excluded under the new scheme. Another change of far-reaching consequences was made by the Ministry of Education in 1971 when the practical tests were removed and

multiple-choice type question papers introduced. The initial proposal was to replace the practical examinations in the GCE (AL) by continuous assessment of practical work at school level. However, this scheme was soon abandoned on the grounds that subjectivity made the assessments unreliable. The tragic consequences of these decisions can be seen today in the total neglect of laboratory work at school, and the emergence of the phenomenon of "tuition en masse", both of which are doing incalculable harm to the students during a crucial phase of their secondary education.

Although women had sat the Technical College entrance examination in the late 1940s none had succeeded in securing admission. The Faculty admitted its first woman student in 1960 and since then there has been a steady increase in numbers. Most women are found to choose Civil Engineering as their area of specialization, but there have been students in the other Departments - Electrical, Mechanical etc. - as well. At present about 15% of the total intake are women. At the time of writing (Dec. 1991) the Faculty's output of graduates stands at 3882 of whom 290 are women.

From the early days of the Faculty it had been realized that the First Year course was not a satisfactory one as it was very largely a Science course. But no changes were possible until more class room and laboratory space became available, when the transfer to Peradeniya took place. Since the Engineering Faculty was attracting the best of the Physical Sciences students it was to be expected that this category of students would be finding part of the courses in Physics, Chemistry and Mathematics in the First Year rather a repetition of what had been done at school. It was therefore decided to give direct admission into the Second Year to candidates of special excellence. Two were admitted in this way in 1961 and the number rose to 29 in 1965 creating an awkward "bulge". No sooner had the Faculty settled in at Peradeniya, the First Year course was restructured as an entirely engineering course within the Faculty itself, and 152 freshmen were admitted to it in 1966.

The beginning of the language problem

Compulsory instruction in the national languages at school level was introduced in the late 1940s and by the mid - 1950s a new generation of students, who had been taught science subjects in the mother tongue, were arriving at the University. There was considerable political pressure on the University in 1958 to change the medium of instruction which was English. The immediate response of the University was to hold the Preliminary Examination in three languages viz. Sinhalese, Tamil and English, starting in 1959. Candidates were required to sit the examination in the medium in which they will be examined for the Higher School Certificate Examination. Fortunately, the schools themselves took a realistic view of the difficulties of the situation and introduced measures at a late stage to equip the students with a basic knowledge of English. The Faculty was therefore able to carry on without any serious problems with the medium of instruction until it took over the First Year course in 1966. By then it was clear that some of the Swabasha students were in urgent need of special assistance. A series of measures were then introduced and tried out to deal with the problem, and based on this experience a policy decision was made in 1970 to adopt "bilingual" streams in the First Year with English Language classes for those who needed it. From the Second Year upwards the instruction would be in English only. This arrangement appeared to suit most of the students at this time.

Recognition by the British professional institutions

In the early years of the Faculty of Engineering the recognition of the degree was sought from the Institutions of Civil, Electrical and Mechanical Engineers, London. Such recognition, which had been granted to the engineering degrees of British Universities, would give our graduates exemption from the Parts I and II of the Institution Examinations for the professional charter. Since the Faculty had been preparing students for the London examinations in 1950-53, it was assumed that the request would not encounter any difficulty. Besides,



Fig. 3. Engineering Workshop I of the Faculty : the Machine Shop (1964).

the Faculty also had the support of the external examiners all of whom were teachers of British Universities. The ICE and IEE readily granted the recognition in 1955 but not the IMechE which, after some delay, turned down the request in Feb. 1957. Among the reasons adduced were the poor strength of the Mechanical Engineering Department staff and the Institution's concern for the standard of English of our graduates. After a few years a fresh attempt was made in 1964, this time with the support of Dr. W. Railston, Scientific Advisor to the Department of Technical Co-operation, London and Prof. L.J. Kastner, Professor of Mechanical Engineering, King's College, London. The latter took up our case with the IMechE and the response was favourable. In March 1966, Prof. J.L.M. Morrison, Vice-President of the IMechE visited the Faculty in Peradeniya at a time when the Chair of Mechanical Engineering had already been filled, and the staff position was much better. His recommendations led to the granting of recognition for the period 1964-69. Continued recognition was to depend on the satisfactory development of the courses and the laboratories of the Department; the medium of instruction would also be a factor for future consideration. In March 1967 the newly formed Council of Engineering Institutions, London (CEI) confirmed its recognition of our degrees without any new conditions. However, due to the varying academic standards and the increasing complexities of engineering courses across the world the CEI decided in April 1978 to review all accreditation granted. In consequence all exemptions granted to our graduates ended on 31 Dec. 1982. In the meantime the Institution of Engineers, Sri Lanka, had been established as a fully professional body in 1956, in succession to the Engineering Association of Ceylon, which had been formed fifty years earlier in a different milieu. To grant the professional charter the Institution set up its own Examination Boards, and its first Parts I and II examinations were held in 1969. By the time the recognition of our degree by London was lost in 1982 the Sri Lanka Institution had already become well established, and the demand for the London Charters had begun to fall off. No attempt has been made by the Faculty since then to regain the lost recognition, as the staff strength

had declined alarmingly and the knowledge of English among our graduates had deteriorated markedly.

Research by Staff

In spite of the acute shortage of men, money and material, some research work was done in Colombo with a fair measure of success. One of the early efforts was made by Mr. J.C.V. Chinnappa, Lecturer in Mechanical Engineering. His special interest was in Solar Energy and his early experiments were on solar evaporation. After starting some work on Solar Refrigeration during his sabbatical leave in London, he continued with it in Ceylon to obtain a Ph D (Lond) in 1961. Other members of the staff engaged in research were Dr. S. Gnanalingam on the Effect of Ionospheric Conditions on Radio Wave Propagation, Mr. P.H.D. Wikramaratna on Measurement of Soil Pressures using pneumatic strain gauging techniques and Dr. S. Mahalingam on Mechanical Vibration. The publication abroad of research papers from such work was a useful start in establishing the Faculty in a small way in the international scientific community.

Staff Changes: the besieged fortress

Some new appointments were made to the staff in the early years: Mr. G.D. Somasundaram (1952) and Dr. S. Gnanalingam (1956). Both appointments were Lecturers Grade I - now called Senior Lecturers - and the former was also made Acting Head of the Mechanical Engineering Department. As a result of the increase of intake in 1956 several new Assistant Lectureships were created in the late 1950s. The conditions of service in the University were still sufficiently good to attract the best of our graduates, and a number of appointments were made in the period 1959-64. In March 1964 Dr. J.C.V. Chinnappa, who had been the Acting Head of the Mechanical Engineering Department since 1958, was appointed to the Chair. This appointment placed the Mechanical Engineering Department on the same footing as the other two departments.

But another disturbing trend was also becoming evident - the resignation of experienced teachers seeking academic careers elsewhere. The causes were many: dissatisfaction with working conditions in the University, poor salaries, uncertainties of the Faculty's future with the likely introduction of Swabasha instruction and the attractions of better education of children abroad. Among the early resignations were: Mr. G.D. Somasundaram (1958), Dr. S. Gnanalingam (1960) and Mr. P.H.D. Wikramaratna (1961). At this stage the Faculty began to look like a besieged fortress - those inside wanting to get out and those outside wanting to get in. The departure of senior staff in increasing numbers and the recruitment of Assistant Lecturers to replace them was a pattern that continued for some years. In the early 1970s, however, these "brain drain" losses became so heavy that they could no longer be replaced, with the result that the Faculty's courses began to suffer.

The Departmental Libraries: Small but not beautiful

The Library is central to the intellectual life of a Faculty and its efficient organization is an essential requisite for research. It was decided in the very early days that there would be a single Engineering Library in Peradeniya, in contrast to the system of departmental libraries favoured by the Faculty of Science at that time. It would be designed to have the best possible facilities for teaching and research. For its immediate needs in Colombo, however, the limitations of staff and space made it necessary for the Faculty to set up departmental libraries. These small, run-it-yourself libraries, managed by the departmental staff without any professional assistance, could not provide anything more than a bare minimum lending service. The allocation of money for books and periodicals was just about sufficient, and the journals required for immediate research were on regular subscription. Some success was also achieved in obtaining back volumes of some of the more important journals as donations from sympathetic institutions abroad. These departmental libraries came under the overall management of the University Librarian in Peradeniya, who exercised complete financial

control under the authority of the Library Committee of the Senate. Needless to say such remote control often caused delays in obtaining urgently required books and reference papers.

Sports activities on a "pocket handkerchief"

In the Colombo years the Faculty student body was small, but it was able to make a commendable impact on University sports when pitted against the older and larger Faculties. The students of the day were largely from the big urban schools, and many of them had taken part in school sports. They made full use of the sports facilities in Colombo which were really quite small compared to what is now available in Peradeniya. The first Vice-Chancellor has described the unsatisfactory arrangements in Colombo where "all sports activities except swimming took place on a pocket handkerchief at Thurstan Road which was totally inadequate for a University College of 500 students" (22). Some Engineering Faculty sportsmen did well enough to find places in University teams. In the early years the Faculty had conspicuous success in winning the Challenge Cup for Boxing in the Inter-Faculty meet, and in 1956 an Engineering student captained the All-Ceylon Soccer team. In the immediate post-war years the standard of athletics in the University was comparatively high and some University students found places in the national teams for the Olympic Games. The Faculty teams performed creditably well in athletics in those years. The decline in sports in the University over the years may be attributed to the replacement of sports by tuition at school level, and to the much lower credit now given to sports achievements at interviews for jobs. During his administration Sir Ivor Jennings used to deplore the "C3 - physiques" of some undergraduates, and one wonders what he would have said about the vast majority of present day students to whom sports activities have no appeal.

Staff-student relationships

The Colombo years were characterized by a very cordial

staff-student relationship. The end of the third term was jointly celebrated on what was called the Dean's Day - now Faculty Day - and the main event was the Staff-Students Cricket Match. The divisions of national politics had not crept into student affairs in those days, and there was not a single strike by students during these Colombo years. The student body of the Faculty was small, rather homogeneous in composition and its problems were therefore easily ironed out. The picture was to change abruptly after the move to Peradeniya and the consequent direct exposure to political influence by residence in Halls. In Dec. 1965 the Engineering students, actively participated in a Campus strike which led to, for the first time, a clash with the Police, acts of violence and damage to University property.

5. DEVELOPMENT OF THE FACULTY IN PERADENIYA, 1964-71.

"..... So often the completed undertaking has an apparent simplicity that may surprise the [civil] engineer himself when he reflects on the complexities of research, planning and design and the problems of construction which had to be solved in the process"

- Banks, James A. President, Inst.C.E.,(1966) (23)

The unfinished project

At the time of the much-delayed move to Peradeniya in mid-1964, the Faculty buildings were not quite ready. Some parts of the construction were still unfinished, while others were held up due to lack of funds. The University Council reviewed the situation and reported with a certain amount of satisfaction that:

"After many setbacks and delays, the projected transfer of the Faculty of Engineering from Colombo to Peradeniya was finally effected in October 1964. The building programme was not quite complete at the time when the transfer was done but arrangements were made to reduce as much inconvenience as possible...." (24)

In the same Annual Report the Dean, who was not so satisfied, also said that more funds were required to complete the buildings and to provide the basic equipment necessary. But no funds were forthcoming since, as far as the University authorities were concerned, the physical transfer of the Faculty to Peradeniya was complete and the student intake had been suitably increased; the Faculty could now be left to fend for itself. Two years later, in the Annual Report for 1966, Prof. E.O.E. Pereira, having returned to the Deanship, made his complaints louder and more explicit.

"In regard to the Faculty, generally, attention must once again be drawn to the fact that funds have not been provided for the completion of Stage I of the Engineering project, namely the work in connection with the original shift to Peradeniya. The Faculty buildings have not been completed. Foundry equipment has been lying around for want of a building. Steel and other materials lie exposed to the elements as there is no storage space. There are no gutters and drains. As a result the corridors and laboratory buildings get flooded. The electrical wiring in most laboratories, which is temporary and roughly improvised, is a serious hazard to students and staff....." (25)

Some of these deficiencies have since been rectified over the years, but there are still no gutter pipes and the corridors still continue to get flooded. In the 1970s a great deal of damage was done to the Faculty grounds during the short-lived grow-more-food campaign, the primitive drainage system was wrecked and the area began to get flooded during heavy rains. When the campaign ended the restoration work that followed was very slow and half-hearted. In 1988, during his Deanship, Prof. Amaratunga took a keen interest in the environment and built a network of drains to solve the flooding problem of the grounds. What also needs to be mentioned is that at the time of the move to Peradeniya in 1964 there was no street lighting in the Faculty grounds, where the students usually move around until 8 p.m., the closing time of the Library. Ten years later when the Faculty celebrated its Silver Jubilee in 1975, some sort of street lighting had to be provided during the Exhibition. This was improvised with G.I. pipes stuck in the ground, with naked bulbs suspended forlornly from the top, and the electrical wiring hanging in festoons between poles. It strongly resembled, appropriately perhaps, the lighting systems in engineering construction sites, and remained there unchanged for the next ten years. In Dec. 1985 an improved system, with concrete posts and fixed lights, was installed during a general rehabilitation of the Faculty buildings for the visit of the President. But the festoons remained. Despite these shortcomings this improved lighting has been welcomed by students

as well as by members of the public coming to the cultural programmes in the E.O.E. Pereira Theatre. The two-decade wait for street lighting in the country's premier Faculty of Engineering is an indication of the poverty of our educational institutions, and the lack of official concern about such matters.

The Engineering Library

With the arrival of the Faculty in Peradeniya the three departmental libraries were amalgamated to form the Engineering Library. It had 4200 books, 118 journals on subscription and 860 bound volumes of periodicals - a small Engineering Library by University standards, but the only library of its kind in the country. A researcher in the Faculty had nowhere else in Ceylon to turn to for references. For additional sources he had to depend on British institutions such as the Science Museum Library, the National Lending Library etc. The position was much better in the Faculties of Science and Medicine where the University's resources could be supplemented by those of the CISIR, TRI, RRI, MRI etc. It was therefore vital from the point of view of the engineering profession to develop the Library to a high level of excellence as soon as possible. But that was not to be. It continued to languish in its state of unchanging genteel poverty - a poverty that is likely to be with us always.

It is very unfortunate that little attention has been paid to the University's libraries in the post-Jennings period. To most University administrators the libraries have always remained in a penumbra, and when cuts had to be made in allocations, the Engineering Library had to take its share of punishment, notwithstanding the sharply rising prices of books and periodicals and the increasing student intake. Very few protests were made. The Library's plight was seen but not heard. It was thus compelled to depend, more and more, on the book-aid and other hand-outs that came its way from sympathetic donor countries.

Distinguished academics who have visited the Main Library have commented on its obvious inadequacies and their remarks are equally applicable to the various Faculty libraries. In 1942, the inaugural year of the University, Sir Ivor Jennings referred to the University Library at Thurstan Road in the following words :

".....There is hardly any subject for which the library facilities in Ceylon are adequate. The University Library contains some 32,000 volumes covering all branches of learning in the Faculties of Oriental Studies, Arts and Science. It could not be described as an "adequate working library" until it reached 200,000 volumes. It is particularly lacking in what may be called "sources"....."(26)

In 1959, seventeen years later the Ceylon University Commission headed by Prof. J. Needham (the Needham Commission) said much the same thing:

".....The University Library is being developed on sound lines and in time should prove a great national asset... The Library still bears the stamp of its origins in the days of the University College when it had to cater primarily to undergraduate teaching and learning. If University research is to be given greater emphasis, the development of the library for basic research must also be given greater emphasis"(27)

As it turned out the Needham Commission was too optimistic about the future. Over the years the value of the Rupee has depreciated a great deal and there has been a continuing shortage of foreign exchange. All these brought immense hardship to the University's libraries. The lowest point was reached when the import of journals was completely stopped in the entire University system in 1973 and 1974. At that time the number of periodicals on subscription for the Engineering Library was 179 and there was no other institution in the country where any of these journals could be found. Mercifully, a partial restoration of the purchase of journals was permitted in 1975,

and 73 periodicals were ordered. Attempts have been made since 1975 to fill the two-year gaps in the stocks of bound periodicals, but only partial success was achieved as funds were not allocated for the purpose. Due to repeated requests for more journals the number on order rose slowly to 105 in the period 1975- 85. The prices of periodicals were rising steeply in this period, but the increase in the annual financial allocation for the Engineering Library was only marginal. The vote was thus used more and more to meet the committed cost of periodicals on order, leaving very little money for books. In the period 1985-90 even the periodicals on order could not be paid for with the annual vote. This led to sharp cuts in the list of journals.

To-day the Faculty Library is pathetically small compared to that of a similar institution such as the Indian Institute of Technology (IIT), Madras, which is younger by a few years. The student population of this Institute is about the same but it has rather large post-graduate schools. And it is generously funded by the Central Government. The following figures show the size of the Engineering Library compared to the I.I.T (Madras):

	Books and Periodicals Peradeniya Engineering		
	1964	1986	I.I.T.(Madras)1981
Books....	4200	19,200	112,500
Periodicals on subscription.....	118	105	1,690
Bound Volumes....	860	7660	—

It is a matter of great regret to add that the Engineering Library has had no allocation of money for books for two consecutive years, 1986 and 1987. The allocation for books in 1988-90 was negligible. Can the country afford to let its engineering libraries starve like this?

The Laboratories

In view of the organizational changes that are taking place in the Faculty all the time, it is worth recording the lay-out of laboratory facilities in 1964.

Starting from the northern end of the main corridor, the first laboratory was that of Electrical Engineering, housing the facilities for Electrical Power, Electrical Measurements, Electronics and Communications. The specially designed High Voltage Laboratory building was located behind the main laboratory. The next laboratory building was split into the Soils Laboratory in front, and the Surveying Instruments Section in the rear. Strength of Materials, Structural Engineering and Metallurgy (with Materials Science) shared the third laboratory. Fluid Mechanics (Hydraulics and Air Flow) occupied the entirety of the fourth building, the towing tank for model experiments and the network of pipes being the most conspicuous features. Applied Mechanics occupied the front part of the next building, the major part of it being taken up by Heat Engines, with its boilers, turbines, engine test beds etc. The supporting facilities such as overhead water tank, water cooler, fuel tank etc. and the boilers' chimney were located outside this laboratory. The Engineering Workshop occupied the remaining two laboratory buildings. The first one contained the Machine Shop and Foundry while the second building contained the Carpentry Shop. The Machine Tools and Consumable Stores were in two separate rooms in a building linking the two Workshop buildings; the stocks of steel and timber were kept in a shed in the enclosed yard behind the Workshop.

The administration of the Workshop needs special mention. The Workshop is the vital service centre of the laboratory system, and its management and funding are of concern to research workers as well as members of the staff in charge of laboratories. Many universities have a separate Workshop for each Engineering Department in order to eliminate inter-departmental friction. This was a luxury Ceylon

could not afford. There had to be just one central Workshop, under the management of the Dean, with a special allocation of funds for running it. As noted earlier Prof. Pereira had a keen interest in the Workshop and he took complete charge of the design of the building, the selection and lay-out of equipment and the final installation of machinery. His efforts have given the Faculty a well laid out Workshop which has been able to accommodate and provide training for our ever-increasing student population and also fabricate apparatuses designed for teaching and research.

There were two Drawing Offices. The larger one was designed to accommodate, rather generously, 125 students in the First Year Engineering Drawing classes. It was later made to accommodate 150, and at present the intake of 250 is divided into two groups of 125 each. The smaller Drawing Office caters to the Third and Fourth Year Civil Engineering students and was planned to accommodate 80. It has since been extended and can now accommodate a class of about 100.

The Auditorium (The E.O.E. Pereira Theatre)

A few words about the auditorium might be of interest to the reader. From the early days of planning Prof. Pereira wanted to have a large lecture theatre where the entire staff and students could be comfortably accommodated to listen to a lecture by a visitor. With a well-designed stage it could serve as a theatre for plays, cultural events etc., and also as the venue for Special Convocations. With the abandonment of the construction of the Convocation Hall adjoining the Senate Building, the Open Air Theatre was the only venue for plays staged in the Campus. The Arts Theatre is really a large lecture theatre and has no stage. The construction of this auditorium, which had been strongly opposed by the Vice-Chancellor Sir Nicholas Attygalle who considered it too extravagant, was therefore a welcome addition to the amenities of the Campus.

The Engineering Theatre was designed to accommodate 600 people and the planning was done by Prof. Pereira and the University Architect Mr. T.N. Wynne-Jones. Much thought was given to the kind of seats to be provided. Cushioned seats were ruled out in view of the extensive vandalization of furniture and fittings that occurs in public places and vehicles. Finally seats of satin wood of a pleasing and robust design were decided upon, and they have stood up very well to over twenty five years of wear and tear, with very few repairs. When the theatre was completed it was the best theatre in the Kandy district, and had the added advantage of having ample parking space for cars. It was its distance from Kandy, and perhaps the poor bus service to Penideniya that limited the flow of requests for its use for cultural programmes.

For some years now there has been an acute shortage of classrooms, and the Auditorium has been in regular use as a Lecture Theatre for a class of about 250 students.

Crisis in the University

While efforts were being made to complete the buildings as well as the installation of equipment serious disagreement arose between the Dean and the Vice-Chancellor in 1965, stemming from what was seen to be the Vice-Chancellor's tendency to intervene in comparatively minor Faculty matters. He had been in office for ten years and with his combative style of administration the idea of "University autonomy" had come to mean increasing centralization of administration, and greater concentration of power in the hands of the Vice-Chancellor. Finally in protest Prof. Pereira resigned from the deanship in Nov. 1965. The Vice-Chancellor then appointed Prof. R.H. Paul as Dean of the Faculty.

However, these unhappy developments in the Faculty were overshadowed by some serious events in the University. A campus-wide student strike took place in Dec. 1965 and the Police were called in to restore order. For the first time in the history of the

University there was a violent clash between the students and the Police, and serious injuries were sustained by both sides; the Vice-Chancellor's Lodge was set on fire. On the orders of the Ministry of Education the University was closed down for a few months and a Committee of Inquiry was appointed to report on the events that had taken place. The government expressed its serious concern with the state of affairs in the University and announced its intention of replacing the prevailing Ceylon University Ordinance No. 20 of 1942 with a new Higher Education Act which among other things empowered it to exercise greater control over University matters. Among the charges levelled against the University Administration by the Ministry of Education was the abuse of University autonomy. Meanwhile a freeze on all expenditure, new appointments, new construction projects (including housing), administrative changes etc. was imposed by the government.

1966 and all that

The government's plan for reorganization of the three Universities took the form of the Higher Education Act. No. 20 of 1966 which came into force on 14 Sept. 1966. The most important feature of this Act was the formation of a National Council for Higher Education (NCHE) which was entrusted with "the control of expenditure on Higher Education, the maintenance of academic standards, co-ordination of Higher Education Institutes ..." Among the provisions made was for the appointment of the Vice-Chancellor. The University Court was abolished, thus ending elections for the post of Vice-Chancellor which had been the cause of much friction and division in the University. Instead, the Minister of Education was empowered to make the appointment from a list of three names submitted to him by the NCHE. Financial control of the three Universities was entirely in the hands of the NCHE. A few cosmetic changes such as re-naming the University Council and Registrar as "Board of Regents" and "Secretary" respectively were also made. Sept. 1966 marked the end of an era in the history of the University of Ceylon. Political interference in University administration, which

Sir Ivor Jennings had strongly resisted, had come at last. In course of time every new government would introduce a new Higher Education Act the primary purpose of which would be to impose on the University the kind of political control desired by the Minister of Education.

With the introduction of the Higher Education Act the Vice-Chancellor Sir Nicholas Attygalle and his chief executive, the Registrar, retired in Sept. 1966. A senior member of the Ceylon Administrative Service (CAS) - formerly the Ceylon Civil Service (CCS) - Mr. S.J. Walpita was the new Vice-Chancellor. The appointment was, at his own request, for a period of two years. He served for the period Nov. 1966 to June 1968 and was succeeded by Mr. M.J. Perera, who had served as Permanent Secretary to the Ministry of Education. Mr. M.J. Perera brought to his office some specialized knowledge of its problems, but unfortunately, he did not stay long. In Feb. 1969, a detachment of army volunteers was, with his approval, billeted in the Gymnasium for a few days, in preparation for the Independence Day celebrations in Kandy. During this brief stay a serious clash between the army personnel and students took place and much damage was done to University property. Mr. M.J. Perera accepted personal responsibility for the incidents and resigned. He was succeeded by Prof. E.O.E. Pereira, whose appointment brought back an academic to the helm of the University. Clearly the experiment with non-academic Vice-Chancellors had not been a success and would not be tried again. The new Dean of the Faculty of Engineering was Prof. J.C.V. Chinnappa of the Department of Mechanical Engineering.

The Higher Education Act also changed the service conditions of staff members. The age of retirement was raised to 62, a welcome change which eliminated the uncertainties of the earlier regulations. Under the old Act a University teacher's retirement age was 55, but he could be given a five-year extension. This regulation had been modified by the University authorities into a one-year-at-a-time

extension up to a maximum of five years, as was the practice in public service. Clearly the idea was to keep the teachers on their toes and more responsive to authority in the twilight of their careers. The Teachers' Associations had protested at the inroads being thus made into their rights but the University Council had remained unmoved. The new Act also provided for staff members who did not wish to continue in service under the changed conditions to retire with compensation. One member of the Engineering Faculty staff retired under this provision.

The newly created NCHE also decided to review the academic credentials of the staff members of all three Universities as there had been complaints of irregularities and lowering of standards of recruitment. The Engineering Faculty on its part had always been able to attract applicants of the best quality, and had never departed from the standards laid down for the selection of teachers. This inquiry did not therefore touch any member of the Faculty staff.

When the new Act had been passed by Parliament the election of the Deans took place in Sept. 1966, and Prof. Pereira was once again elected to head the Faculty of Engineering.

The outgoing Vice-Chancellor

Throughout his tenure of office Sir Nicholas Attygalle was at loggerheads with the Faculty staff and the Dean. A few words about him might therefore be of interest. A former Professor and Dean of the Faculty of Medicine, he had been a member of the country's Senate - the Upper House - and its President. An authoritarian, by temperament, his administrative style was very different from that of his predecessor Sir Ivor Jennings; he was inclined to deal with problems by confrontation. He had done much as Dean to develop the Faculty of Medicine, which he regarded as an elite professional faculty. At that time teachers in Medicine and Engineering enjoyed special salary scales, higher than that given to teachers in other faculties. The Vice-Chancellor did not approve of the benefits

enjoyed by the Engineers, and when two members of the staff were promoted to lectureships in 1955 he put them on the (lower) general scale. As noted earlier this controversy was finally resolved by the intervention of the University Court in 1964. The dispute over the location, size and funding of the Engineering project lasted two years and was resolved by the University Council in 1958. An annual irritant was the intake to the Faculty. During his tenure of office the intake to the Faculty was fixed without any consultation with the staff; they were merely informed of the decision. In 1965, when the housing problem was nearing resolution, the Vice-Chancellor created a new issue: he floated the idea of a truncated, three-year engineering degree course to replace the existing one. But before he could develop his ideas on the subject his term of office was truncated by the Higher Education Act No.20 of 1966.

New departments, new appointments

For a long time the University had followed the general policy of creating a Chair only when it was satisfied that a separate department was required for a particular subject, which was of sufficient importance to be headed by a Professor. The creation of Personal Chairs and multiple Chairs within a Department had not still become a feature of University practice. Proposals for new Departments and Chairs were examined annually by the Staffing Committee whose recommendations were submitted to the Council. Often a Faculty request for a Chair would meet with several refusals before it was finally accepted, because such a proposal usually involved financial provision for staff (academic and non-academic), buildings, equipment, furniture etc. and money was always short. A Department that did not require much capital outlay was that for the subject of Mathematics, and it was therefore not surprising that the first new Chair to be created in the Faculty in Peradeniya was that for Engineering Mathematics. The Chair and an Assistant Lectureship were created in 1965, and Dr. E.F. Bartholomeusz, who had joined the staff at the inception in 1950, was appointed Professor.

In 1967 the University Council accepted the Faculty's proposals for a Department of Applied Electronics and provision was made in the 1967/68 cadre for one Professor and three Lecturers. The Chair was advertised in 1969 but not filled. In 1970 the proposed department was merged with the Department of Electrical Engineering to form the new Department of Electrical and Electronic Engineering so that when the Chair of Applied Electronics, renamed Chair of Electronics, was filled in 1976 it became the second Chair in the combined Department. By this time the idea of multiple Chairs in a Department had already become an accepted practice.

A Chair of Hydrology and Fluid Mechanics, was created in 1969 with a view to setting up a new Department, but the candidate selected did not take up the appointment.

In the meantime Prof. R.H. Paul, who had been the Head of the Department of Electrical Engineering since 1950, retired in 1967, and Dr. W.P. Jayasekara was appointed to succeed him in May 1968.

In Sept. 1969, the NCHE approved a recommendation of the Senate to create a Personal Chair for Dr. S. Mahalingam of the Department of Mechanical Engineering who had been awarded the DSc(Eng) by the University of London for his work on Mechanical Vibration. It was the Second Chair in that Department, and the first of its kind in the Faculty.

During the period 1966-72 that the NCHE was in existence, it showed an appreciation and understanding of the problems of the Faculty of Engineering, and much more was achieved in the creation of new Departments and Chairs and new Assistant Lectureships than was ever thought possible under the old University Council. In spite of the inroads made into University autonomy, the NCHE system displayed a concern and impartiality that was greatly welcomed by the Faculty of Engineering.

The First Year Course in the Faculty

The revision of the entire degree course structure had already been under study in Colombo and was taken up soon after the arrival in Peradeniya. Particularly urgent was the drafting of the syllabuses and regulations for the First Year Course which would now be entirely in the Faculty. The main objectives were to introduce basic subjects such as Engineering Drawing, Workshop Technology and Surveying in the first year and also to give an Engineering emphasis to the Physics that had been taught at school level. The transfer of Engineering Drawing back to the first year also made it possible to accommodate new topics of growing importance in the Second and Third Year syllabuses. When the proposals for the First year course were approved by the Senate the first batch of freshmen were admitted to it in Oct. 1966. The subjects were grouped as follows, and the new First Examination in Engineering was held in Aug. 1967:

Section A: Mathematics; Engineering Physics;
 Engineering Materials; Workshop
 Technology & Surveying; Engineering
 Drawing.

Section B: English

The creation of a separate section for English, as had been done for Engineering Drawing earlier, was to help the weaker students. With the introduction of this new scheme Engineering Drawing ceased to have the special position it held in the Part I of the Old Regulations.

For lectures the class was divided into a Sinhala/English group and a Tamil/English group. The teaching was intended to be mainly in Sinhala and Tamil in the early stages, with more and more English being introduced as the course progressed.



Fig. 4. Students at work in the Computer Centre (1980).

A change was made in 1969 when the combined Workshop Technology & Surveying paper was split into two separate papers, each of three hours duration.

All these changes were regarded as temporary because a complete revision of the course structure was already in hand.

Preparation for teaching in Swabasha

From about 1960 the University was being urged by the Ministry of Education to prepare for the eventual switch-over to Swabasha instruction in all science-based courses. Since both glossaries and text-books were lacking, the Ministry set up specialist committees to compile glossaries, and encouraged University teachers to write or translate books in Science and Technology. Several Faculty staff members served on glossary committees for various subjects. Each of these committees was made up of a language specialist and several technical specialists. In response to the call for text books Dr. W.P. Jayasekara of the Electrical Engineering Department undertook the translation of a well known text-book "Applied Electricity" by H. Cotton. This translation was completed in 1966, but is still languishing in the Ministry awaiting publication. Due to the changes in government policies on the media of instruction, the publication of text-books appears to have been put off indefinitely.

The introduction of S.I. Units

In Oct. 1968 the teaching of engineering courses in Universities and Technical Colleges in Britain was switched over to the S.I. units. In introducing this international system of units particular attention was necessary in Civil and Mechanical Engineering subjects where the work had been done entirely in Imperial Units. This change in the educational system was parallel to the introduction of metric weights and measures, and the switch-over to decimal coinage in public life in that country.

The introduction of S.I. in the British Universities had been carefully planned very much ahead and was implemented simultaneously at all levels without any serious difficulty. Here in the Engineering Faculty the matter was discussed unofficially in 1969 but there was no unanimity on how the proposals were to be implemented. Some teachers hesitated because they feared difficulties with Tables, Standards, Catalogues etc. Finally it was left to the judgement of individual teachers to decide when and how the change should be made. Some of them introduced the change in 1970 at all levels, and no serious problems were encountered. In fact many of the students welcomed the disappearance of the gravitational constant 'g' from most of their analytical work in Mechanical Engineering. Text-books in S.I. units were of course very few in number, but the problem was not a serious one. There had to be a period of transition in the examination arrangements as it was necessary to provide separate question papers in the old system of units for earlier students who would be resitting the examinations under the Old Regulations. In the 1971 examination papers, under the New Regulations quantities were given in both systems of units, and in each paper the candidate was required to answer a certain minimum number of questions in the S.I. units. This transitional arrangement was implemented smoothly, and by 1973 the switch-over to S.I. units had been satisfactorily completed in most subjects.

The New Regulations

In the early 1960s, when the Faculty was still in Colombo, some discussions were held with a view to making a complete revision of the courses of study and the examination structure. What was envisaged was a three-part Final Examinations scheme, with one examination each year after the First Examination, rather on the lines of the University of London scheme. The updating of the contents of the various courses had of course been going on all the time without a formal revision of the syllabus, but there was an urgent need to regroup some of the subjects in order to keep pace with technological development and changing emphasis. The main point of disagreement

among the staff was the manner in which provision should be made for the man who was often described as "the run-of-the-mill engineer". This was the kind of engineer, often required in government service, who did professional work of a simple routine nature together with a wide range of administrative duties. The "Pass" course had to be tailored to meet the training requirements of such an engineer without burdening him with high technology and advanced analytical work. On the other hand the "Honours" course should equip a graduate with knowledge sufficiently advanced and contemporary for post-graduate courses abroad, and positions of professional responsibility at home. The differences of opinion within the Faculty were largely about the Part III programme (the Fourth Year), and the agreed equilibrium position was embodied in the "New Regulations" of 1969. When the new scheme was accepted by the Senate it was implemented immediately, and the graduation of the first New Regulations batch took place in 1971.

The new course and examination structures are given below. With the passage of time the subjects and their contents would change considerably but the basic format would remain the same.

The new degree - course structure (Part III)

For all Engineering subjects, with the exception of the General Paper, there would be an A-course and a B-course. The former would be mandatory to all candidates - Pass and Honours - offering a subject, and, with the exception of Mathematics, Course Work was an essential component. An Honours candidate in that subject would be required to do, in addition, the B-course, which had more advanced topics. In most subjects there was no separate Course Work for the B-course it being assumed that the pass in the Course Work for the A-course was sufficient. The examination paper for the B-course would be a more difficult and challenging one, designed "to separate the man from the boy". A special project, to be undertaken either individually or in a group of two or three, was also mandatory in some Departments. These projects could be experimental or

theoretical in nature, and may even be a design. Under this scheme of examinations it became necessary to have four categories of Honours graduates, namely, the First, Second (Upper and Lower Divisions), and Third.

Regrettably these basic considerations behind the B-course scheme have been watered down with the passage of time. To meet the demand for certain new subjects of special professional interest new B-courses were introduced from time to time, for which there were no counterpart A-courses, and therefore no supporting Course Work. Some of these new courses did not offer much intellectual challenge, and became, in consequence popular "soft options". It was inevitable that this step would lead to a decline in the quality of the Honours degree.

FIRST EXAMINATION IN ENGINEERING

Section A

- 1.1 Mathematics
- 1.2 Engineering Physics
- 1.3 Engineering Materials
- 1.4 Workshop Technology
- 1.5 Surveying
- 1.6 Engineering Drawing

Section B

- 1.7 English

FINAL PART I EXAMINATION IN ENGINEERING

- 2.1 Mathematics
- 2.8 Theory of Structures
- 2.9 Strength of Materials
- 2.10 Mechanics of Fluids
- 2.11 Mechanics of Machines
- 2.12 Applied Thermodynamics
- 2.13 Applied Electricity

FINAL PART II EXAMINATION IN ENGINEERING

(a) Civil Engineering Group

- 3.1 Mathematics
- 3.5 Surveying
- 3.8 Theory of Structures
- 3.9 Strength of Materials & Metallurgy
- 3.10 Mechanics of Fluids
- 3.13 Applied Electricity

(b) Mechanical Engineering Group

- 3.1 Mathematics
- 3.9 Strength of Materials & Metallurgy
- 3.10 Mechanics of Fluids
- 3.11 Mechanics of Machines
- 3.12 Applied Thermodynamics
- 3.13 Applied Electricity

(c) Electrical Engineering Group

- 3.1 Mathematics
- 3.10 Mechanics of Fluids
- 3.11 Mechanics of Machines
- 3.12 Applied Thermodynamics
- 3.13 Applied Electricity
- 3.14 Electrical Theory & Measurements

FINAL PART III EXAMINATION IN ENGINEERING

(a) Civil Engineering Group

'A' Courses

- 4.0 General
- 4.5(A) Surveying
- 4.8(A) Theory of Structures & Geotechnics
- 4.9C(A) Strength and Properties of Materials
- 4.10C(A) Mechanics of Fluids

'B' Courses

- 4.1(B) Mathematics
- 4.5(B) Surveying
- 4.8(B1) Theory of Structures
- 4.8(B2) Soil Mechanics
- 4.10C(B) Mechanics of Fluids

(b) Mechanical Engineering Group

'A' Courses

- 4.O General
- 4.9M(A) Strength and Properties of Materials
- 4.10M(A) Mechanics of Fluids
- 4.11(A) Mechanics of Machines
- 4.12(A) Applied Thermodynamics

'B' Courses

- 4.1(B) Mathematics
- 4.9M(B) Mechanics of Materials
- 4.10M(B) Mechanics of Fluids
- 4.11(B) Mechanics of Machines
- 4.12(B1) Heat Transfer

(C) Electrical Engineering Group

'A' Courses

- 4.O General
- 4.15(A) Electronic Devices & Circuits
- 4.16(A) Communications & Microwaves
- 4.17(A) Power Systems & High Voltage Engineering
- 4.18(A) Electrical Machines & Control Systems

'B' Courses

- 4.1(B) Mathematics
- 4.15(B) Electronic Devices & Circuits
- 4.16(B) Communications & Microwaves
- 4.17(B) Power Systems & High Voltage Engineering
- 4.18(B) Electrical Machines & Control Systems.

In the new scheme of examinations Reference in one subject was permitted at the Part I and Part II Examinations but not at Part III. External Examiners were required for the Part III examination only.

Laboratory developments; new facilities**The do-it-yourself approach**

It has been a long-held view of the Faculty that the design and manufacture of some of the laboratory equipment could be done by the staff when the Workshop and laboratories were operational. The Workshop had been equipped with a wide range of machine tools and had ample stocks of materials; its staff could be easily trained to undertake the fabrication in metal and wood to the standards required. The cost would be a small fraction of the imported equipment, which are often made abroad by small firms with fewer manufacturing facilities than the Faculty Workshop. Also, the design and fabrication would provide the teachers and technicians with valuable skills and experience. The first examples of such manufacture were the experimental apparatuses for the Applied Mechanics Laboratory. The experience gained and the confidence built up over the years by these efforts have been of lasting benefit. In a similar way the Faculty has also developed a tradition of designing and constructing its own buildings in spite of the many administrative problems involved in obtaining men and materials.

Electronics Workshop

With the arrival of the Faculty of Engineering in Peradeniya in 1964 assistance was often sought by other Faculties in the repair of electronics equipment. Earlier their practice had been to send such defective equipment to Colombo for repair, but this took much time and cost a lot of money. The Department of Electrical Engineering decided to help by setting up a Repair Unit within the laboratory in 1969, the work being done by laboratory staff. With the increase in demand for such a service it was then decided to set up an Electronics Workshop. An Engineer and three Technicians were appointed in 1971 and in the same year construction work was started on a new building. It was a two-storey building adjoining the main Electrical Engineering Laboratory, with a total floor area of 4000 sq ft. This Workshop became operational in 1972.

The Applied Mechanics Laboratory

In the late 1950s the form of the Mechanics of Machines course began to change. Earlier the Course Work in the subject consisted mainly of exercises in Machine Design together with a little laboratory work. Over the years the emphasis was shifted to laboratory work and this required additional space for equipment. At the time of the transfer to Peradeniya there were only a few items of imported laboratory equipment for Applied Mechanics, and these were easily accommodated in the laboratory space allocated for the subject at one end of the Heat Engines laboratory. After settling down in Peradeniya, however, a programme of fabrication of laboratory apparatuses in the Faculty Workshop was undertaken, and before long there was an acute shortage of space.

In 1969 the need for a new Applied Mechanics Laboratory was discussed within the Faculty. Dr. M. Amaratunga of the Civil Engineering Department volunteered to design the building and to supervise the construction as a Faculty project, without any payment. The proposal involved the direct recruitment and management of

labour while the purchase of materials would be through the University's normal indenting arrangements. This proposal was readily accepted by the Faculty and the University administration. Since the ground space available was only 80 ft x 50 ft, the foundation and concrete frame were designed for a five-storey building. The money available, however, was for the construction of two floors only. The work was started in mid-1970 and by late 1971 the concrete frame and the two floors had been completed. At this stage the reorganization of the University system ordered by the new government was under study, and since it also involved a review of all building projects in hand, a temporary freeze on all funding was imposed. After a long delay the approval of the project was finally given in 1973, but progress thereafter was slow on account of the general scarcity of building materials. To the great relief of the staff concerned the project was finally completed in mid-1974. The total floor area was about 8000 sq ft, and another floor of 4000 sq ft would be added in 1980.

The Computer Centre

Preliminary discussions were held in 1969 for the purchase of a computer system for the Faculty. In 1970 an order was placed for an IBM 1130 system and the unit arrived in Jan. 1972. It was temporarily housed in the Electrical Engineering Laboratory. In the meantime the construction of the Computer Centre, located alongside the main Electrical Engineering Laboratory, was started in 1971. As with the Applied Mechanics Laboratory, Dr. Amaratunga undertook the design of the building and the supervision of its construction. The available floor area being about 60 ft x 45 ft a five storey building was designed, with only two storeys to be completed in the first stage. This project was not seriously delayed by the reorganization of the University in 1971-72. The construction work proceeded smoothly and the building and installation were completed by mid-1973. Further expansion of the Centre would take place a few years later when, with the creation of a separate Department of Computer Sciences, two more floors would be added to the building.

Staff, Research etc.

By the time the move to Peradeniya was completed the Assistant Lecturers sent abroad in the early 1960s for postgraduate work were also returning. Although there were staff losses due to retirements and resignations during the period 1964-70, the overall strength of the staff increased considerably. As many changes in service conditions affecting the University teachers were being introduced at this time, there was a need to form a Faculty Union to negotiate the special interests of Engineering Teachers. This led to the formation in 1967 of the Engineering Faculty Teachers' Union (EFTU) which was affiliated to the Peradeniya University Teachers' Association (PUTA).

The research work started in Colombo was continued in Peradeniya, and new projects were also added by the staff returning after postgraduate training. Among the laboratories where new work was going on were Soil Mechanics Laboratory and the Materials Laboratory.

Preparations were made in this period for Masters degree courses, and also for research programmes leading to the MScEng, M Phil and Ph D. Regulations for these courses and degrees were drafted in 1970, and by 1971 some students had been enrolled for the Master's degree. The first Master's degree would be awarded in 1973.

6. DIVERSIFICATION, 1964-71

"The increase in man's knowledge of his environment, and the development of new techniques and disciplines based on that knowledge, seem at present to make it impossible for any single individual to cover more than a fraction of the field. This leads to fragmentation, and the growth of discrete specialist disciplines. This growth is predictable on present doctrine, since within acceptable time limits of education to first or second degree level, and with an average spread of intelligence, the amount of information that can be imparted to and absorbed by an individual pupil is assumed to be fixed. The corpus of knowledge, on the other hand is constantly increasing, and at an increasing rate. Thus the number of chunks of discipline into which a field has to be divided if the whole of it is to be covered somewhere and somehow by graduates entering the professions must also increase."

Sir Michael Cary (1969) (28)

When the Faculty had settled down in its new home in Peradeniya by mid-1965, it was time to embark on the second stage of its development. This consisted of the setting up of new departments and new courses, the consideration of which had been put aside during the Colombo years due to the preoccupation with the Peradeniya project and the lack of accommodation. A great deal of work was waiting to be done because the departmental structure of the Faculty had remained unchanged since 1950. In the meantime the great strides taken by the government in the agricultural and industrial development of the country called for a greater technical contribution from the personnel trained by the Faculty of Engineering. It was therefore necessary to design a wider spectrum of courses to meet this need. The following new Departments were envisaged in the immediate expansion programme of the Faculty:

1. Production Engineering
2. Chemical Engineering
3. Agricultural Engineering

The new courses introduced would be largely within the existing departmental framework.

By the time the proposals for these new departments had been drafted the NCHE had already come into being, and its approval was obtained without much delay. But serious difficulties were to come a few years later when a new government abolished the NCHE and replaced it by another body which ensured an even greater degree of state control. These changes in University administration were embodied in the University of Ceylon Act No. 1 of 1972 which came into effect on 21 Jan. 1972. By this Act all the Universities in the country came under a unified, centrally administered University of Ceylon, with its offices in Colombo. The head of the University was designated the Vice-Chancellor. The constituent Universities were renamed Campuses, five in all, each headed by a President. All these heads were appointed by the Minister of Education. Such Campus bodies as Faculty and Senate were relegated to mere advisory roles, and the central authority, unquestioned and unchecked, could simply brush aside any opposition to its views from these and other local bodies. Consequently there were many instances in which decisions were made in Colombo without any attempt to seek the views of the Campus bodies directly affected. This state of affairs offered much scope for inter-Campus and inter-Faculty rivalries, the winners being invariably those who were successful in obtaining the patronage and support of University and Ministry of Education authorities. One consequence of this development was that the Faculty's diversification programme came under review and the Vice-Chancellor ordered the transfer of two of these embryo departments, whose staff were already undergoing training abroad, to other Faculties which were clearly being favoured. All these drastic changes were the fall-out from the "University Reorganization", the victims of which were not granted the basic courtesies of either consultation or explanation from

the authorities.

New Departments

The Department of Production Engineering

The industrial development of a country involves the setting up of many manufacturing processes, carried out in industrial units of varying sizes and varying levels of mechanization. The numerous processes that occur, the organization of manufacture, and the management of men and machines are subjects that do not fall within the scope of a course in Mechanical Engineering. In recognition of the need for special courses in this field, proposals for a Department of Production Engineering were submitted by the Faculty in 1967. On obtaining approval from the NCHE two Assistant Lecturers in Production Engineering were appointed in May 1968 and temporarily attached to the Department of Mechanical Engineering. (In fact the Mechanical Engineering Department would be called upon to act as guardian to all three new departments during their long drawn-out, and even stunted, adolescence). In due course these two Assistant Lecturers were sent abroad for their post-graduate training. The task of building up the new Department would be entrusted to them on their return in the early 1970s. No serious difficulties were anticipated in the early stages as this Department had the use of the Faculty Workshop as a base until its own, separate laboratories were ready. In the meantime the Faculty was fortunate in obtaining two expatriate lecturers for this Department in 1971. One of them, an experienced academic from the United States, was supported by the Fulbright scheme, while the other was recruited directly from Britain. These two lecturers were able to give Production Engineering a start by organizing courses of lectures and by setting up a few basic laboratory experiments using the limited resources available in those very austere years. The growth of this Department was seriously hampered by the lack of funds and it was only in 1978 that the degree in Production Engineering would be awarded for the first time - ten years after the launching of the Department.

The Department of Chemical Engineering that survived

None of the Faculty's Departments has had such a troubled history as that of Chemical Engineering. It all began in March 1966 when the Faculty submitted proposal to set up a Department of Chemical Engineering in view of the growing importance of the subject in the industrial development of the country. As a first step it was decided to seek expert advice from an eminent specialist. The assistance of the British Council was sought and through its good offices the services of Prof. D.M. Newitt FRS were obtained as consultant. He visited the Faculty in Oct. 1968 and his report containing proposals for the setting up of the Department and the training of staff was accepted by the Board of Regents and the NCHE. Provision was made in the 1968/69 estimates for a staff consisting of a Professor and three Assistant Lecturers. Three million rupees were voted for the buildings and equipment. The staff recruited were to be attached to the Mechanical Engineering Department to begin with. In the meantime efforts were made by the British Council to obtain the services of a Professor of Chemical Engineering, on contract for a period of two years, to help put the new department on its feet. These efforts were unsuccessful.

Three Assistant Lecturers were recruited in March 1969. Two of them were Mechanical Engineering graduates while the third was a Chemistry graduate. As recommended by Prof. Newitt they were sent to Britain to follow a one-year conversion course. It was expected that on their return they would be able to prepare preliminary plans relating to the new courses and laboratories, before going back to Britain again for their doctoral programmes.

At this point the future of the department appeared secure. In fact when the University of Ceylon Act No. 1 of 1972 came into effect official recognition was reaffirmed by the gazette notification which listed the Department of Chemical Engineering as one of the six constituent departments of the Faculty of Engineering, Peradeniya Campus.

In the meantime a new development was taking place the consequences of which no one could have foreseen. By 1971 it was evident that the efforts to find a Professor had failed and, since the services of the three Assistant Lecturers would not be available for about three years, the new department would take several years to get off the ground. At this stage a very welcome proposal was initiated by the British Council in association with the Overseas Development Authority (ODA). It was to link the proposed Department of Chemical Engineering with the Houldsworth School of Applied Science, University of Leeds, in an exchange programme which would ease the immediate staff problems. The linkage would also involve the broadening of the courses of studies planned earlier, and the transforming of the department into a Department of Applied Science. Following on this proposal several discussions were held in Peradeniya, Colombo and London between representatives of the Faculty, the University of Leeds and the ODA. When an understanding was reached, the President of the Peradeniya Campus wrote to the Vice-Chancellor recommending the acceptance of the Leeds proposals in view of the many benefits that would accrue to this Faculty from the linkage.

When all this ground work had been done some powerful interested parties saw it fit to intervene in the negotiations. In consequence the Minister of Education wrote to the Vice-Chancellor instructing him to transfer the proposed Department of Applied Science to Katubedde where the College of Technology had been given University status in Jan. 1972 under the new University of Ceylon Act. The construction work in Peradeniya, which was about to begin, was stopped, and the financial provision withdrawn. Strong protests against this turn of events were made by the Faculty, and in response the Ministry of Education appointed a committee of inquiry to report on the matter. The report of this committee has never been released.

Further steps were taken by the University authorities in Colombo during 1974 and 1975 to complete the liquidation of this Department

by transferring its entire academic staff to Katubedde. These efforts were successfully resisted, and the staff remained attached to the Mechanical Engineering Department of the Faculty. They organized a number of courses in Chemical Engineering within the framework of the "New Regulations" of 1969, and the first batch of Chemical Engineers graduated in 1978 while the Faculty awaited a square deal from the new authorities in Colombo. This unhappy state of affairs continued until 1981 when the Department of Chemical Engineering was finally approved by the University Grants Commission (UGC) - set up under the Universities Act No. 16 of 1978 - and funds provided for staff, buildings and equipment. However, the Faculty had to wait for another six years before the approval of the Chair of Chemical Engineering was forthcoming.

The Agricultural Engineering Department that never was

The story of Agricultural Engineering in the Faculty is one with an unhappy ending. Its planning started with preliminary discussions between the Faculty of Engineering and the Faculty of Agriculture and Veterinary Science in 1967. There was general agreement that the proposed Department had to be a "bridge - department", run jointly by the two Faculties. The proposals received the approval of the NCHE and as a first step the Faculty of Engineering appointed a Mechanical Engineering graduate in Feb. 1969 to specialize in Agricultural Engineering at post - graduate level. The Faculty of Agriculture on its part appointed an Agriculture graduate to specialize in some specified aspects of the proposed programme. In the meantime in July 1969 the Faculty of Engineering approved the structure of the course that the proposed Department was to undertake. It was to take the form of a post - graduate, conversion course, with a one-year programme for Engineering graduates and a two-year programme for Agriculture graduates, leading to a Diploma. The course was expected to commence when the two Assistant Lecturers, on their return from post - graduate training, were able to set up basic laboratory facilities.

But, as in the case of Chemical Engineering, the reorganization of the University system under the University of Ceylon Act (1972) offered much scope to interested parties that enjoyed the patronage of the authorities. In 1973, without any consultation with the Faculty of Engineering, the Vice-Chancellor ordered the transfer of the proposed Department to the Faculty of Agriculture and Veterinary Science, Peradeniya. That Faculty now had a new Dean, and the promoters of this move entertained the confidence that they could run the new Department on their own without the official linkage with the Faculty of Engineering. The courses they envisaged were different from that agreed upon earlier, and would have a reduced content of engineering. As for the teaching they were confident they could count on the services of visiting engineering lecturers from outside the University. Unpleasantly surprised by this turn of events, the staff of the Faculty of Engineering began to count the number of blows they had received under "University Reorganization", and made their protests but they were of no avail.

As a reaction to these events the Faculty decided in May 1973 to run its own independent course in Agricultural Engineering, having the same status as its courses in Civil, Electrical Engineering etc., with the specialization taking place in the third and fourth years. But the course was obviously dependent for its implementation on the approval and establishment of a separate Department in the Faculty and the provision of funds. Since such a step had no support from the authorities in Colombo, the Faculty's resolution remained a mere "declaration of intent". However, due to a revival of interest, Agricultural Engineering would be introduced some years after as an elective subject in the Faculty.

New Courses

Metallurgy and Materials Science

In recognition of the importance of Metallurgy in all branches of Engineering an Assistant Lecturer was appointed in 1950 to specialize

in this field. He was a Chemistry graduate and was attached to the Department of Chemistry. During the Colombo years he gave the Part I students a course in this subject, which became part of the combined subject of "Strength of Materials and Metallurgy" in the Part I Examination. Laboratory space was provided for Metallurgy in the Peradeniya project, and soon after the transfer of the Faculty to Peradeniya an Engineering graduate was appointed as an Assistant Lecturer to specialize in this field. In contrast to the earlier arrangements he was to be a full-time member of the Faculty staff. In 1971 the Metallurgy Section was expanded further by the addition of two more Assistant Lecturers. Over the years the laboratory has been developed steadily and it is now strong in the areas of Microscopy, Heat Treatment and the Chemical Analysis of Metallic Materials.

In recognition of the demand for more knowledge of engineering materials in Sri Lanka the Faculty now provides many more courses. The examinations have a full paper in "Engineering Materials" in the First Year, half a paper in "Strength of Materials & Science" in the Third Year and half a paper in "Strength of Materials & Metallurgy" in the Fourth Year. The Fourth Year course is taken by Production and Chemical Engineering students, who also have an Elective Paper in Metallurgy. The course contents have grown steadily with time and, in keeping in step with the requirements of Industry, the emphasis is largely on Metallic Materials and Ferrous Metallurgy.

Electronics in Electrical Engineering

Following the practice in many British Universities, Electronics was taught in the early years as part of the subject of Telecommunications. But it soon became a rapidly-expanding subject of great importance and its applications began to extend well beyond the field of Telecommunication Engineering. The old vacuum tube devices gave way to novel solid state ones, and there was an enormous increase in the knowledge concerning physical phenomena, devices, applications etc. which had to be imparted in undergraduate courses. Wherever the framework of the course structure permitted

this was done, but major changes had to wait until the New Regulations were introduced in Peradeniya.

In 1967 a new Department of Applied Electronics with a Chair and three lectureships was proposed by the Faculty, and the modernistic appeal of the word "Electronics" was sufficient to obtain ready approval from the higher authorities of the University and the NCHE. However, three years later it was decided to follow the practice in many foreign Universities and merge the new department with the parent department to form the Department of Electrical and Electronic Engineering with Chairs in the important areas of study. By 1978 the Department had been developed sufficiently to have three Chairs, the specialities being Power, Communications and Electronics.

With the introduction of the New Regulations the Electronics content of the basic Electricity Courses would greatly expand and distinct subjects on advanced electronics topics at the Third and Fourth Year levels would evolve for the benefit of the specialist student.

Computer Science: "Prepare to meet thy Computer"

Proposals for the acquisition of a digital computer was first made in 1968. In Oct. 1970 a firm order was placed for the purchase of an IBM 1130 computer system with 16K word central processor, line printer, card read punch, plotter and three card punches. The purchase price was Rs. 580,000/=, and funding was through the suppliers' credit. The computer was delivered in Dec. 1971.

In anticipation of its acquisition a course in computer programming in FORTRAN was commenced in 1969 for the Final Year students. The arrangement was to hand-punch the cards in the Faculty and to run the programmes on the ICL computer in the State Engineering Corporation in Colombo which was the only general purpose computer available in the country at that time.

With the introduction of the New Regulations a B-course in Computer Science was commenced at the Final Year level in 1970. This course was conducted until 1976 when it was discontinued, primarily due to the deteriorating staff position. However, the FORTRAN programming course was continued as an intensive course for the Final Year students, and it was later advanced to the Third Year class. With the acquisition of several micro-computers in later years, and the creation of a Department of Computer Sciences, the teaching and content of the various courses in the field would change a great deal.

At the time of its purchase the IBM 1130 was one of the few computers available in the country, and it has given valuable service not only to University academic departments but also to outside organizations. Although the useful life expectancy of such computers is only about five years it had been in uninterrupted use in the Faculty for over 12 years.

Training in Industry

Practical training during University vacations and soon after completion of the degree course, has always been deemed by the Faculty to constitute an important part of the training of an Engineering student. As in the drafting of syllabuses and courses of study for engineering students, the planning of industrial training is subject to several constraints. The problem has been stated succinctly by Lord Hinton in his Presidential Address to the Institution of Mechanical Engineers, London in 1966. He said that

"... the problem that faces us today is that of finding a pattern of training attuned to modern educational ideas, which produces reasonably good engineers while not, by its harshness, frightening men away from the profession by superimposing an unacceptable burden of practical training which is more onerous than that found to be necessary [some years ago]....."(29)

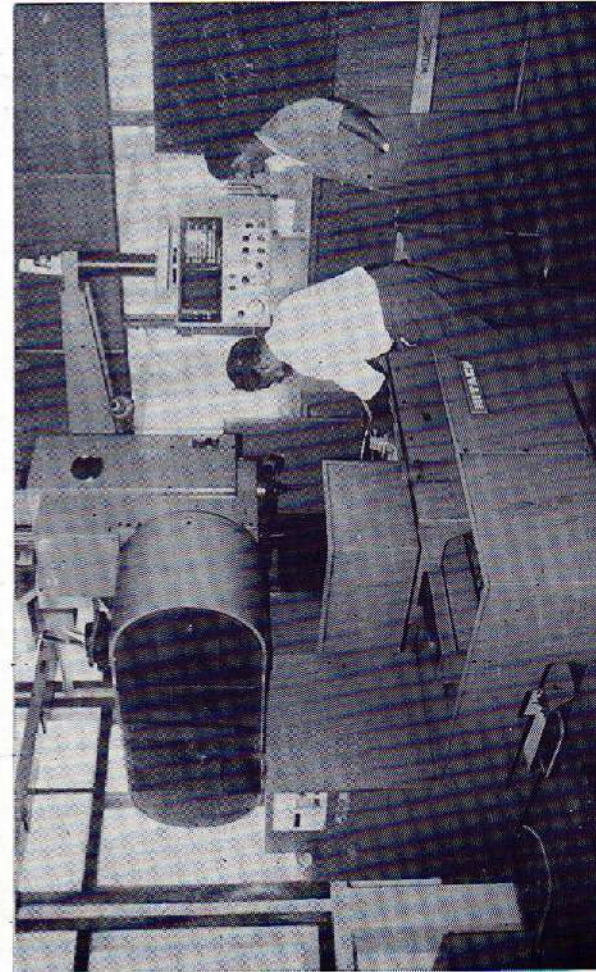


Fig. 5. Computer Numerically Controlled (CNC) Machine in the Production Engineering Laboratory (1985).

Although no formal training programme was arranged by the Faculty in the early years, students were encouraged to obtain employment during their vacations in government engineering departments and state corporations, and individual letters of recommendation were provided to assist them. Formal arrangements between the Dean and prospective employer - organizations were first made in 1971, and some lecturers in the Faculty were nominated to liaise with the employers concerned. The students were paid a per diem allowance, and were required to submit reports to their respective supervising lecturers at the end of their training. The Faculty was successful in placing almost all the Second Year and Third Year students. This contact with employers was also helpful to the students when they sought employment after graduation, particularly in lean years when jobs were limited.

The situation began to change when the College of Technology in Katubedde - later to be given University status - was established in the late 1960s. The Diploma/Degree course of this College was of the sandwich type, with a compulsory one-year "in-plant training". As a result not only was there competition for the placement of under-graduates for vacation training and for employment after graduation, but there were also the expected rival claims of superiority. In subsequent years the Faculty would spend much time in discussions of the objectives of vacation training and its most appropriate format in relation to the degree course.

Meanwhile the National Apprenticeship Board (NAB) was set up by Act of Parliament in 1972, for organising all industrial training programmes, with substantial funding for the payment of allowances to trainees. Discussions with the NAB were initiated in 1976, and as a pre-requisite to its involvement it was necessary to incorporate this training as a compulsory requirement of the degree course. The Faculty examination regulations were amended accordingly, and arrangements made with the NAB for its participation. The programme, now called "Industrial Training", commenced with the batch of First Year students in 1979. A Senior Lecturer with wide

practical experience was specially recruited, and Training Standards were drawn up in detail by joint committees of the Faculty and the NAB. (The NAB has now been replaced by the National Apprenticeship and Industrial Training Authority (NAITA)).

Needless to say, there was some opposition to all these arrangements from the student body right from the beginning. In subsequent years the three 10 - week periods of training envisaged originally would be whittled down for a variety of reasons.

Special Course in English

Reference has already been made in Chapter 4 to the problem of teaching English to students who had studied their A-level courses in Swabasha. When the First Year students were admitted directly into the Faculty of Engineering in 1966, it was decided to make English a regular subject and to place it in a group by itself in the First Examination as Section B. The course was conducted by the staff of the Department of English and the examination in the subject was held for the first time in March 1967. Due to the increasing demand for such instruction a separate Sub-Department of English was set up in 1968, and several Instructors were appointed to it. The main objective of the course was to help the students to acquire sufficient proficiency in English to follow the Lectures, write laboratory reports, read library books etc. The organization of the course was of an ad hoc nature and served its purpose since the numbers of students in urgent need of the course were small. Exemptions from the course and from the examination paper were given to students whose knowledge of English was considered adequate. In later years the steep decline in the knowledge of English among freshmen would lead to the formation of an English Language Teaching Unit (ELTU) which provided an intensive course prior to the commencement of the First Year courses in Engineering, and continuing courses during the First Year, all of which were compulsory.

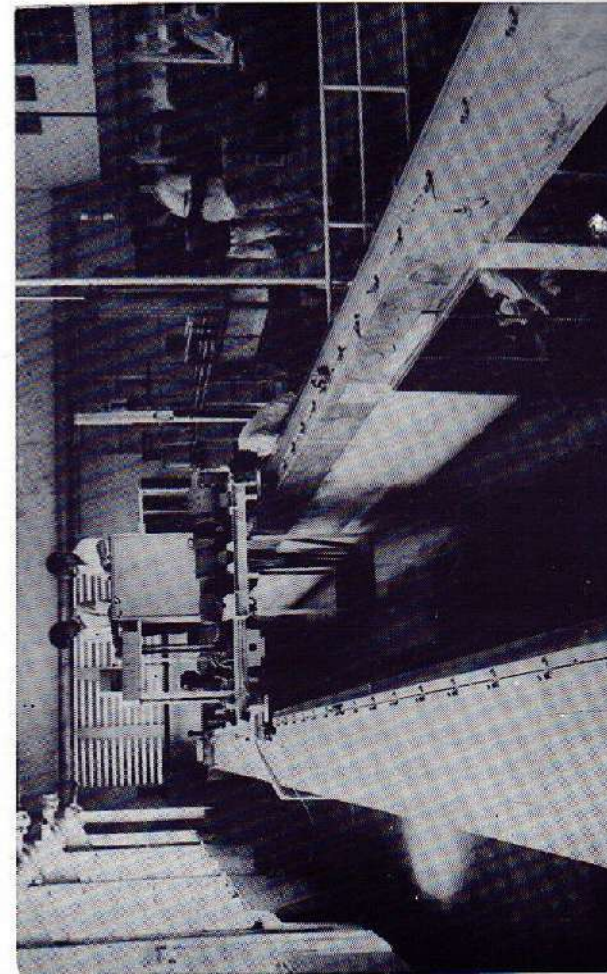


Fig. 6. Towing tank and wave-maker in the Fluids Mechanics Laboratory (1964).

The first twenty one years

The extraordinary circumstances under which it had been created, and the serious problems that it had inherited in conjunction with the meagre resources of staff, laboratory facilities and space that were available to it, had placed the Faculty under great strain in the early years. However, its task was made lighter by a sympathetic and understanding administration that responded quickly when problems arose. A few years later, when the Faculty was getting into its stride, progress was hampered by a series of diversionary and contentious issues such as the size of the engineering complex, unplanned increases of intake, staff salaries and housing, all of which originated from an unfriendly and parsimonious administration. In spite of all these difficulties much was achieved in the first twenty one years. A well laid out building complex, with ample room for expansion, laboratories with up-to-date equipment, a large Workshop generously equipped with machine tools and ample stores, a well-balanced academic team, most of whom had doctorates, were the main assets of the Faculty in 1971. For twenty one years it had been the only source of supply of graduate engineers in the country. It had produced in this period 1245 graduates (including 15 women), many of whom now occupy positions of high professional responsibility at home and abroad. The guiding hand in all these years was that of Professor E.O.E. Pereira. A man of vision, tenacity, courage and industry, with remarkable qualities of leadership, he served the Faculty as Dean almost uninterruptedly for about 19 years, and the University as Vice-Chancellor for two years. It is a tribute to his foresight and careful planning that the Faculty has weathered the storms and turbulences of sudden large increases of intake, the heavy loss of trained staff and the sharp cuts in funding, all of which have greatly troubled it in the last two decades.

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APPENDIX I

FACULTY OF ENGINEERING: SPACE PROVISIONS, 1964

A Administration Block		25,000 sq ft
Ground Floor		
1. General Office	9,140 sq ft	
2. Lecture Rooms	3,360 sq ft	
First Floor		
3. Library	9,375 sq ft	
4. Tutorial Rooms	3,125 sq ft	
B Drawing Office (Civil Engineering)		13,200 sq ft
1. Drawing Office	9,600 sq ft	
2. Map Room	3,600 sq ft	
C Lecture Theatre I		1,800 sq ft
D Lecture Theatre II		1,800 sq ft
E Auditorium (E.O.E. Pereira Theatre)		7,000 sq ft
F Drawing Office (Mechanical Engineering)		13,200 sq ft
1. Drawing Office	9,600 sq ft	
2. Drafting and Printing Rooms	3,600 sq ft	
G Electrical Engineering Laboratories		19,200 sq ft
1. Communications	3,600 sq ft	
2. Elem. Electricity	3,600 sq ft	
3. Elec. Measurements	2,400 sq ft	
4. Electrical Power	7,200 sq ft	
5. High Tension	2,400 sq ft	

H	Soil Mechanics & Surveying Laboratories	16,800 sq ft
	Soils & Highway Engineering	10,800 sq ft
	Surveying	6,000 sq ft
J	Materials & Metallurgy Laboratories	16,800 sq ft
K	Mechanics of Fluids Laboratory	16,800 sq ft
	1. Air Flow	4,800 sq ft
	2. Hydraulics	12,000 sq ft
L	Heat Engines & Applied Mechanics Laboratories	14,400 sq ft
	1. Heat Engines	12,400 sq ft
	2. Applied Mechanics	2,000 sq ft
M	Heavy Workshop	10,000 sq ft
	1. Machine & Fitting Shops	8,000 sq ft
	2. Foundry & Welding	2,000 sq ft
N	Carpentry Shop	5,000 sq ft

 161,000 sq ft

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APPENDIX II

DEANS OF THE FACULTY, 1950 - 1971

1.	E.O.E. Pereira	16.03.1951	-	.11.1965
		24.09.1966	-	09.02.1969
2.	R.H. Paul	.11.1965	-	24.09.1966
3.	J.C.V. Chinnappa	25.03.1969	-	09.12.1971

HEADS OF DEPARTMENTS, 1950 - 1971

1.	Civil Engineering			
	E.O.E. Pereira	01.07.1950	-	09.02.1969
2.	Electrical Engineering			
	R.H. Paul	01.07.1950	-	30.09.1967
	W.P. Jayasekara	01.05.1968	-	
3.	Mechanical Engineering			
	J.C.V. Chinnappa	01.03.1964	-	09.12.1971
4.	Engineering Mathematics			
	E.F. Bartholomeusz	13.08.1965	-	30.06.1974

APPENDIX III

ACADEMIC STAFF (PERMANENT), 1950 - 71

Name	Date of appointment	Date of retirement/ resignation
1. E.O.E. Pereira	01.12.1947	09.02.1969
2. R.H. Paul	01.07.1950	30.09.1967
3. T. Sivaprakasapillai	01.07.1950	30.04.1975
4. H.B. de Silva	01.07.1950	30.09.1980
5. J.C.V. Chinnappa	23.08.1950	20.12.1971
6. P.H.D. Wikramaratna	02.1951	30.04.1961
7. P. Selvanayagam	09.1950	10.11.1965
8. E.F. Bartholomeusz	01.07.1950	30.06.1974
9. W.M.G. Fernando	14.11.1950	30.09.1989
10. W.P. Jayasekara	03.11.1950	30.09.1990
11. K. Arumugam	01.09.1950	30.10.1966
12. S. Mahalingam	16.06.1952	30.09.1991
13. G.D. Somasundaram	01.08.1952	31.03.1958
14. S. Gnanalingam	04.03.1955	06.05.1960
15. U.S. Kuruppu	01.06.1958	30.11.1967
16. C.L.V. Jayatillake	15.06.1961	
17. J.A. Gunawardena	01.09.1961	
18. S. Naguleswaran	01.09.1961	30.09.1972
19. A. Thurairajah	23.07.1962	31.03.1985
20. S.M.A. Perera	01.08.1963	28.02.1966
21. M. Amaratunga	16.09.1963	01.04.1990
22. N.S. Karunaratne	05.10.1963	16.07.1969
23. S. Sivasegaram	11.12.1964	10.02.1984
24. H.R. Sirisena	11.12.1964	30.09.1971
25. A.K. David	11.12.1964	31.07.1980
26. A.R.T. de Silva	11.12.1964	10.05.1974
27. K. Shanmuganathan	02.02.1966	25.11.1974
28. G.P. Karunaratne	01.09.1967	31.07.1975

29. S. Selvalingam	01.09.1967	31.07.1975
30. N.B. Rambukwella	01.09.1967	30.12.1980
31. V. Thevendiran	01.09.1967	15.09.1980
32. V.B. Karunaratne	01.09.1967	30.10.1982
33. J.B.X. Devotta	01.09.1967	31.05.1979
34. M.P. Ranaweera	01.09.1967	14.09.1978
35. N.E. Wijesundere	01.10.1967	26.06.1980
36. V. Shanmuganayagam	17.12.1967	29.02.1984
37. H.H.J. Keerthisena	02.06.1968	
38. S. Rajendran	02.06.1968	03.10.1974
39. J.S. Gunasekera	02.06.1968	12.06.1978
40. R.J.K.S.K. Ranatunga	02.06.1968	01.07.1988
41. D.J. Gunaratnam	04.05.1969	03.10.1978
42. R. Galappatti	21.02.1969	15.08.1987
43. S. Selvavinayagamoorthy	04.05.1969	30.09.1979
44. R. Mahalinga Iyer	01.02.1969	04.1982
45. T. Vinayagalingam	01.02.1969	15.09.1978
46. T.D.M.A. Samuel	03.01.1969	
47. G.K.G.K.K. Gaminibandara	03.03.1969	19.12.1980
48. W.D.K. Gunatilleke	15.03.1969	15.09.1989
49. W.J.N. Fernando	01.09.1969	
50. B.L. Tennakoon	27.05.1970	30.06.1972
51. G.C. Rodrigo	29.12.1970	31.07.1972

APPENDIX IV

ENGINEERING GRADUATES

SUMMARY OF EXAMINATION RESULTS

(Figures in brackets indicate women graduates)

Year	Speciality	1st Class	2nd Class	Pass	Total
1953	Civil	01	02	01	04
	Electrical	-	01	01	02
	Mechanical	-	-	-	-
	Total	01	03	02	06
1954	Civil	03	02	10	15
	Electrical	01	01	03	05
	Mechanical	02	02	02	06
	Total	06	05	15	26
1955	Civil	02	06	11	19
	Electrical	-	02	02	04
	Mechanical	-	-	04	04
	Total	02	08	17	27
1956	Civil	-	03	06	09
	Electrical	-	02	01	03
	Mechanical	-	02	04	06
	Total	-	07	11	18
1957	Civil	03	05	07	15
	Electrical	-	02	03	05
	Mechanical	-	02	02	04
	Total	03	09	12	24

Year	Speciality	1st Class	2nd Class	Pass	Total
1958	Civil	03	05	04	12
	Electrical	01	02	05	08
	Mechanical	-	01	02	03
	Total	04	06	09	19
1959	Civil	01	10	09	20
	Electrical	02	02	02	06
	Mechanical	01	02	02	05
	Total	04	14	13	31

Year	Speciality	1st Class	2nd Class		Pass	Total
			Upper	Lower		
1960	Civil	02	-	06	10	18
	Electrical	03	-	01	03	07
	Mechanical	01	-	02	02	05
	Total	06	-	09	15	30
1961	Civil	04	-	06	17	27
	Electrical	03	-	02	04	09
	Mechanical	-	-	02	06	08
	Total	07	-	10	27	44
1962	Civil	04	03	07	20	34
	Electrical	-	01	03	06	10
	Mechanical	02	-	01	03	06
	Total	06	04	11	29	50
1963	Civil	06	02	15	17	40
	Electrical	02	-	01	05	08
	Mechanical	01	-	01	05	07
	Total	09	02	17	27	55
1964	Civil	06 (1)	05	12	21	44 (1)
	Electrical	01	01	01	02	05
	Mechanical	01	-	01	03	05
	Total	08 (1)	06	14	26	54 (1)
1965	Civil	08	13	17	30	68
	Electrical	03	01	02	09	15
	Mechanical	-	01	02	03	06
	Total	11	15	21	42	89
1966	Civil	04	-	05	58	67
	Electrical	01	02(1)	04	04	11 (1)
	Mechanical	02	-	01	14	17
	Total	07	02(1)	10	76	95 (1)

Year	Speciality	1st Class	2nd Class		Pass	Total
			Upper	Lower		
1967	Civil	04	03	08	50	65
	Electrical	-	02	01	17 (1)	20 (1)
	Mechanical	01	01	02	11	15
	Total	05	06	11	78 (1)	94 (1)
1968	Civil	03	02	04	50 (1)	59 (1)
	Electrical	-	-	03	13	16
	Mechanical	05	03	08	22	36
	Total	08	05	15	85 (1)	111 (1)
1969	Civil	-	02	17	63 (1)	82 (1)
	Electrical	-	-	03	17 (1)	20 (1)
	Mechanical	-	-	03	30	33
	Total	-	02	23	110 (1)	135 (1)
1970	Civil	06	03	21 (1)	101 (1)	131 (1)
	Electrical	-	-	02	20 (2)	22 (2)
	Mechanical	-	04	09	40	53
	Total	06	07	32 (1)	161 (3)	206 (4)

Year	Speciality	1st Class	2nd Class	3rd Class	Pass	Total
		Upper	Lower			
1971	Civil	01	05	15	22	33 (3)
	Electrical	-	02	02	-	10 (1)
	Mechanical	02	03	05	07	16
	Total	03	10	22	29	59 (4)
1972	Civil	04 (1)	10 (1)	26 (1)	55 (2)	17 (2)
	Electrical	-	-	03 (1)	02	08 (1)
	Mechanical	02	02	10	15	17
	Total	06 (1)	12 (1)	39 (2)	72 (2)	42 (3)
1973	Civil	01 (1)	01	19 (1)	56 (4)	27 (3)
	Electrical	01	01	02	10 (1)	06 (1)
	Mechanical	02 (1)	-	10	15	11
	Total	04 (2)	02	31 (1)	81 (5)	44 (4)
1974	Civil	-	-	-	-	03
	Electrical	-	-	-	-	02
	Mechanical	-	-	-	-	01
	Total	-	-	-	-	06
1975	Civil	03	08	25 (1)	36 (4)	31 (1)
	Electrical	-	-	02	15 (2)	11 (1)
	Mechanical	02	02	02	03	26
	Total	05	10	29 (1)	54 (6)	68 (2)
1976	Civil	-	03 (1)	33 (6)	40 (5)	40 (5)
	Electrical	01	-	03 (1)	02	05
	Mechanical	01	02	03	02	14
	Total	02	05 (1)	39 (7)	44 (5)	59 (5)

Year	Speciality	1st Class	2nd Class	3rd Class	Pass	Total
		Upper	Lower			
1977	Civil	03	06	36	35 (2)	35 (2)
	Electrical	02	01	01	01	04 (2)
	Mechanical	02	01	-	-	03 (2)
	Production	01	-	01	02	-
	Total	08	08	38	31 (2)	41 (4)
1978	Chemical	-	-	05	01	06
	Civil	01 (1)	11	27 (4)	30 (7)	29 (6)
	Electrical	03	-	01	03	08 (1)
	Mechanical	-	01	06	06	05
	Production	-	01	02	01	03
	Total	04 (1)	13	41 (4)	41 (7)	48 (7)
1979	Chemical	-	-	01	-	02
	Civil	05	04	14 (1)	37 (4)	19 (3)
	Electrical	-	-	01	02	06 (2)
	Mechanical	02	-	04	03	02
	Production	-	-	01	-	02
	Total	07	04	21 (1)	42 (4)	31 (5)
1980	Chemical	-	-	02	-	03
	Civil	02	10 (2)	28 (4)	21 (2)	37 (8)
	Electrical	-	-	-	-	03
	Mechanical	01	03	-	04	06
	Production	-	-	02	-	04
	Total	03	13 (2)	32 (4)	25 (2)	53 (8)
1981	Chemical	-	-	-	01	01
	Civil	01	07	29 (2)	13 (1)	37 (6)
	Electrical	-	02	04	01	05
	Mechanical	-	01	01	08	05
	Production	-	01	01	02	06
	Total	01	11	35 (2)	25 (1)	54 (6)

Year	Speciality	1st Class	2nd Class		Pass	Total
			Upper	Lower		
1982	Chemical	-	02	03	04	09
	Civil	09	11	32(1)	77(8)	129(9)
	Electrical	-	01	01	07(1)	09 (1)
	Mechanical	-	01	01	14	16
	Production	-	-	04	02	06
	Total	09	15	41(1)	104(9)	169(10)
1983	Chemical	-	-	-	07 (2)	07 (2)
	Civil	05	02(1)	27(4)	73(15)	107(20)
	Electrical	02	-	03	19 (2)	24 (2)
	Mechanical	01	-	04	17	22
	Production	-	-	02	10	12
	Total	08	02(1)	36(4)	126(19)	172(24)
1984	Chemical	-	-	-	04	04
	Civil	10	14(2)	23(4)	74(12)	121(18)
	Electrical	05	04	07	08	24
	Mechanical	-	01	05	20 (1)	26 (1)
	Production	-	02	-	10	12
	Total	15	21(2)	35(4)	116(13)	187(19)
1985	Chemical	-	-	-	02	02
	Civil	18 (4)	08	22(3)	75(15)	123(22)
	Electrical	02	02	02	16	22
	Mechanical	01	01	03	19 (2)	24 (2)
	Production	01	01	-	14 (4)	16 (4)
	Total	22 (4)	12	27(3)	126(21)	187(28)
1986	Chemical	-	-	-	-	-
	Civil	-	-	-	-	-
	Electrical	-	-	-	-	-
	Mechanical	-	-	-	-	-
	Production	-	-	-	01	01
	Total	-	-	-	01	01

Year	Speciality	1st Class	2nd Class		Pass	Total
			Upper	Lower		
1987	Chemical	01	-	01	02	03
	Civil	01	01(1)	15(2)	16(3)	18(4)
	Electrical	03	05	06	14(3)	24(6)
	Mechanical	-	01	01	02(2)	04(4)
	Production	-	-	-	15(3)	15(3)
	Total	05	07(1)	23(2)	40(8)	70(13)
1990	Chemical	-	-	01	01(2)	02(2)
	Civil	09 (1)	04(1)	36(6)	41(7)	54(14)
	Electrical	02	07(1)	14(3)	21(4)	30(8)
	Mechanical	-	01	05(2)	6(3)	12(5)
	Production	-	-	-	08(2)	08(2)
	Total	11 (1)	12(2)	56(11)	69(22)	98(36)
1991	Chemical	-	02(2)	01	03	05(3)
	Civil	04 (1)	05	24(2)	29(3)	38(6)
	Electrical	02	05	14	21(3)	32(6)
	Mechanical	-	01	01	02(2)	04(4)
	Production	02	-	01	03	05
	Total	08 (1)	13(2)	41(5)	55(13)	77(24)

FACULTY OF ENGINEERING

Total Number of Graduates up to 31 December, 1991

(Figures in brackets indicate women graduates)

Chemical	59	(05)
Civil	2570	(235)
Electrical	523	(31)
Mechanical	621	(12)
Production	109	(07)
Total	<u>3882</u>	<u>(290)</u>