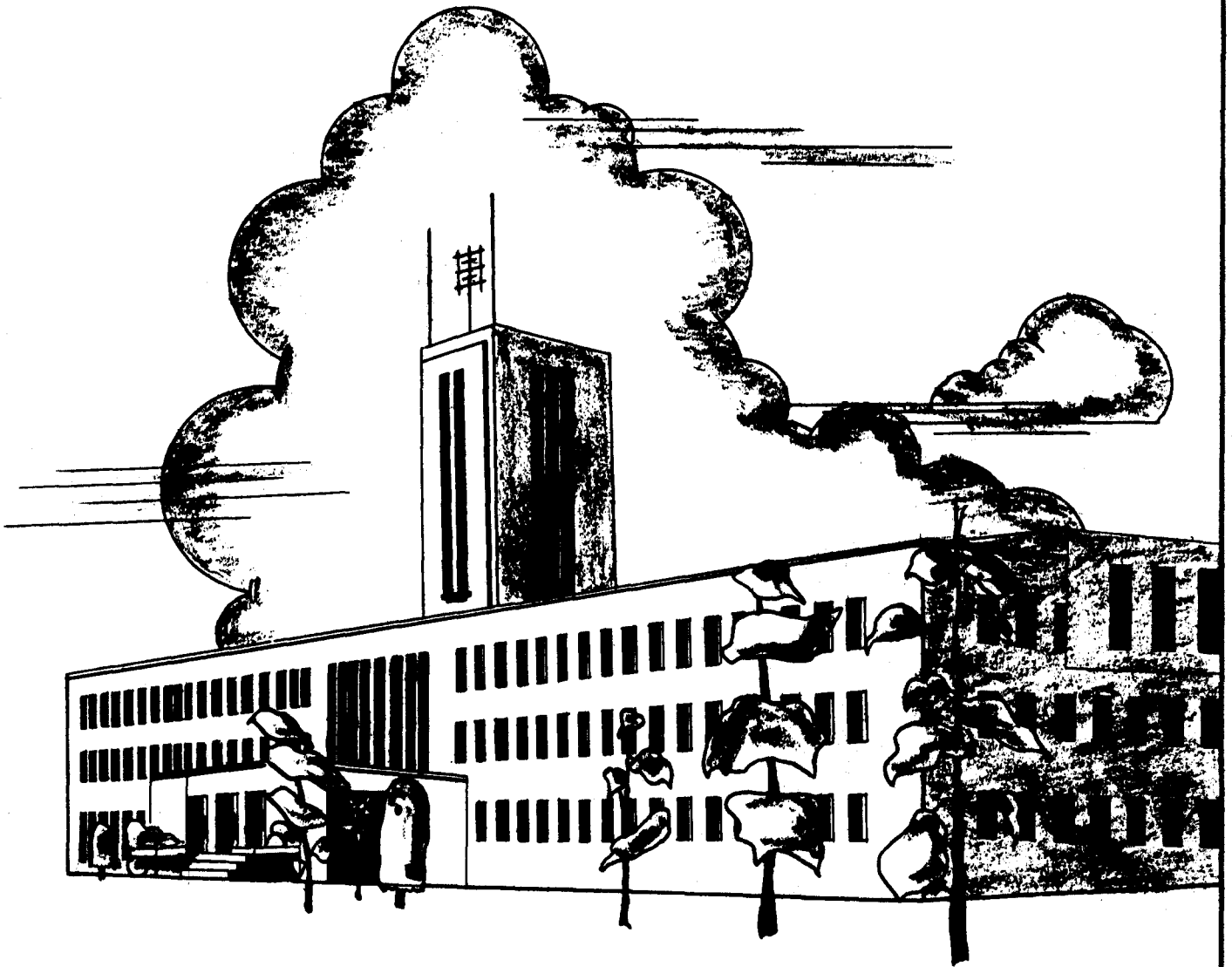


COLLEGE OF ENGINEERING  
SEOUL NATIONAL  
UNIVERSITY



REPORT OF ADVISER IN ENGINEERING  
DECEMBER 1959  
BY  
PAUL ANDERSEN

INTERNATIONAL COOPERATION ADMINISTRATION

Report of Observations, Activities and Recommendations  
Concerning

COLLEGE OF ENGINEERING  
SEOUL NATIONAL UNIVERSITY  
SEOUL, KOREA

Paul Andersen  
Adviser in Engineering

December 1959

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## I. APPRAISEMENT

### 1. History

#### (1) After Liberation

Korea was liberated from Japanese rule on August 15, 1945, and soon after it became apparent that the entire educational system had to be reorganized. The establishment of Seoul National University as the highest institution of learning was one of the main objectives of the reorganization. As a result, on August 26, 1946, a year after the liberation, the College of Engineering, Seoul National University was founded. The physical plant of the college is located at Shinkong-dyk, an eastern suburb of Seoul, and consists of buildings formerly used by Kyung Sung Imperial University and Kyung Sung Mining College. The functions of these two institutions as well as those of Kyung Sung Technical College in downtown Seoul were absorbed by the new engineering college.

On August 15, 1948, with the establishment of the Government of the Republic of Korea, the College of Engineering was organized as a part of Seoul National University. On December 31, 1949, in accordance with the new "Education Bill" this first and only national university in Korea was officially named "Seoul National University".

#### (2) During Korean War.

The outbreak of the Korean War on June 25, 1950 forced suspension of all operations of the College. With the first reoccupation of Seoul on September 28, 1950, the College returned here to resume its function. In November, 1950 upon instructions from the Ministry of Education,

consolidated classes were opened and lectures were offered to the students of all departments. The College evacuated from Seoul, a second time, in January, 1951 in the face of the renewed communist drive. For three years, commencing February 19, 1951, combined classes were conducted in Pusan.

(3) After the War.

The College of Engineering returned to Seoul on October 17, 1953. Because its buildings at Shinkong-duk were, at that time, in use by United States Army, classes were held at the College of Education in Seoul. When the American forces withdrew from the Engineering Campus, the College returned to its own buildings on August 6, 1954.

Along with other institutions in Korea, the College of Engineering has suffered many hardships. When it had almost recovered from the temporary dislocations, that followed the liberation, the Korean War broke out causing widespread damage to its physical plant and laboratory facilities. The years which followed the end of the Korean war marked a period of rapid restoration and reorganization of the Engineering College. While many problems still remain to be solved, the College has attained superior status among the institutions of higher learning in Korea.

Under the auspices of the International Cooperation Administration a contract was signed on June 5, 1954, between Seoul National University and the University of Minnesota. The purpose of this contract was to strengthen and develop the educational and research programs, and to repair and improve the buildings and facilities of

a number of the university's colleges. The Engineering College has been participating in this contract since its inception.

Under this technical assistance program, apparatus and equipment have been received and installed. Rapid progress has been made in restoring laboratories and facilities for research. More than sixty faculty members have participated in the program by study in the United States. Many have completed academic work abroad and have returned to the Engineering College, while others are continuing their studies in the United States.

## 2. Organization

### (1) Departments.

The College of Engineering is organized into twelve departments, namely:

1. Department of Basic Instructions
2. Department of Architecture
3. Department of Chemical Engineering
4. Department of Civil Engineering
5. Department of Electrical Engineering
6. Department of Electronic Engineering
7. Department of Mechanical Engineering
8. Department of Metallurgical Engineering
9. Department of Mining Engineering
10. Department of Naval Architecture and Aeronautical Eng.
11. Department of Nuclear Engineering
12. Department of Textile Engineering

The first of these give courses in mathematics, physics and chemistry as well as in the humanities, social sciences, natural sciences and languages. These subjects are taught to students in all the other departments which offer complete sequences of studies, or curriculums, leading to degrees in the various branches of engineering.

The educational objective of the College of Engineering is to prepare its students for positions of leadership in a world where science, engineering and human relationships are of basic importance. The work during the first year, as far as subjects are concerned, is the same for all students. In this freshman year emphasis is placed on mathematics, physics and chemistry, but cultural subjects also receive attention. The cultural subjects include Korean, English, German, Philosophy, History of Civilization and Outline of Natural Science. Some of these subjects are also taught in the second, or sophomore year. The Department of Basic Instruction teaches the elementary and advanced courses in mathematics, physics and chemistry as well as the cultural subjects which are required or optional.

(2) Enrolments.

The number of students who attend the Engineering College is always considerably less than the authorized number. There is also a considerable decrease in the number between the first and second semester. The following table gives recent statistics for the year 1959.

Department	Author.	Students Enrolled	
		I Sem.	II Sem.
Architecture	160	157	147
Chemical	160	156	155
Civil	180	184	167
Electrical	200	188	184
Electronics	100	92	85
Mechanical	160	170	161
Metallurgical	120	105	104
Mining	160	141	136
Naval & Aeron.	100	95	93
Nuclear	80	22	21
Textile	160	149	144
	<hr/>	<hr/>	<hr/>
	1580	1459	1400

In addition to these undergraduate students working for Bachelor's degrees in their respective fields, there are at present 36 graduate students at the Engineering College. Of this number 33 are taking work for the Master's degree and 3 for the Doctor's degree.



### 3. Previous Reports

In order to understand and appreciate present circumstances at the Engineering College, one must travel back to the early part of 1955 and compare the state of the College and its faculty to conditions as they exist today. Previous reports have been submitted by W.R. Weems (1955) ; C.E. Lund (1955) and W.W. Staley (1957).

The problem, as formulated by Weems, was that of an Engineering College not just to be advised and assisted but to be conceived, planned and developed virtually from "scratch". A number of serious difficulties to be overcome were then seen. These difficulties included such matters as location, compensation, faculty training and physical plant. Pertinent excerpts from the report by Weems appear in the following.

An important feature of the general situation is the inconvenient physical location of the Engineering College. It is located some 10 miles north - east of the center of Seoul. It is situated at the end of a paved road, near the foot of a granite mountain, with nothing nearby but a straggly poor country village. Transportation telephone communications and electricity are unreliable and constantly troublesome. Living conditions are such that virtually all faculty members live in the city, where they can have easy access to schools for their children, and to shopping, cultural and social facilities. They commute from the city to the College and back again as soon as their work is done. Most of the students do the same. The result is a short working day and dominance of the College activities by the transportation situation. The location of the College, while nice from a scenic viewpoint, leaves much to be desired because of its inaccessibility from any good residential area and its isolation from any industrial area. There is a strong argument for leaving the College where it is, in that the main buildings are well constructed and the total space provided is sufficient and of suitable type for housing an engineering school. At the present time the location of the College creates an accessibility problem for both students and faculty. Steps have been taken recently to give relief through rearranging the train schedule and by providing additional busses. Nevertheless, the situation is still serious. Increased transportation

facilities are needed as a temporary solution, but there will be little campus life and little voluntary use of spare time for school activities until a residential community is established around the College. A long-range plan for student and faculty housing should be prepared and initiated at once to accommodate most of the students and faculty within walking distance of the College.

The problem of compensation is an economic one. At the present time almost every faculty member teaches in at least one other college, and some have other side jobs which actually take most of their time. With a man showing up at the College as little as two days a week in many cases, it is well-nigh impossible to get him to assume an attitude of responsibility or to collaborate with others in College administration or planning. The spirit of unity and teamwork of the faculty is greatly handicapped by their never all being in one place at the same time and by their having split allegiances.

The amounts paid by the Government and by the financial support organization, or P.T.A. have been considerably increased this year. But there is still far to go if the faculty is to identify itself as a "team". For example, a professor can make considerably more money by teaching the required minimum of 10 hours per week at the College, and in addition lecturing at some private college on an hourly basis at fees 50 per cent or more higher than he would receive for the same work at the Engineering College or any other College of the Seoul National University system. This situation, of course, greatly inhibits mutual support and integration of the Engineering College with other Colleges through interchange of staff, supporting courses, and the like.

There is a marked tendency among the faculty not to assume responsibility, not to make careful plans and carry them out. Training a large fraction of the faculty in the United States may do much to relieve this situation. It would seem desirable for the University to be active in overcoming the passivity problem in every way.

This report will show that while the Engineering College has become a "going concern", the two great remaining obstacles to effective use of equipment and of an improved physical plant are those of location and compensation.

4. Equipment

When the University of Minnesota undertook to advise the Engineering College in 1954, it was in very bad shape. The buildings were damaged and run down and the laboratories were, for all practical purposes, without equipment. Since then a large amount of equipment has been purchased and installed in the various departments. All laboratories are now well equipped and in constant use. The total cost of the new equipment has been approximately. \$ 1,370,000.00. This figure includes transportation, insurance and estimated cost of procurement. The attached chart shows how the total appropriation has been distributed among the departments.

Frequent inspection tours of the laboratories have been made for the purpose of observing the progress which has been made on their completion. As a result of these inspections it is possible to make an appraisal of their present statuses.

I. Architecture.

Except for filing cabinets, drafting instruments and wood working tools, the department has received no equipment. It is in need of wood working machinery for a model shop and photographic and projector equipment for taking and presenting pictures of contemporary Korean and foreign architecture.

II. Aeronautical.

Items for the new wind tunnel have arrived from United States. A wind tunnel balance, necessary for the operation of the wind tunnel, has been placed on order. Laboratory space for installation is not available. It will be necessary to enlarge Bldg. #5-11 in order to obtain enough floor space for installation and operation.

III. Chemical Engineering.

The unit operations laboratory occupies space in Bldg. #5-13. Other laboratory facilities of this department are being transferred

to this building, which has been equipped with electric light, telephone, water and heat. The liquid fuel laboratory, as well as laboratories for undergraduate and graduate instruction are now located in this building.

IV. Chemistry.

The laboratories of this department are located in Bldg. #5-4. They serve, very effectively, all basic instruction students taking elementary courses in chemistry.

V. Civil Engineering.

This department operates a soils mechanics laboratory and a concrete laboratory, both located on the second floor of Bldg. #2. Equipment for the new sanitary laboratory is now arriving. The hydraulic laboratory is in the planning stage. Definite plans have been made for relief from the present congested situation in the department. The laboratories will be re-located as follows:

Soils Lab; Struc. Lab .....	Bldg. #2
Concr. Lab; San. Lab .....	" #3
Hydr. Lab .....	" #5-6

VI. Electrical Engineering.

Some laboratories (Measurements, Illumination, Servo-mechanism) are located in Bldg. #1 and others (High tension, Power, Transformers, A.C and D.C., Induction, Commutation) are occupying space in Bldg. #4.

VII. Electronic Engineering.

All laboratories are located in Bldg. #1, where efforts should be made to improve their effectiveness. Rooms are too small in poor condition and not functional. Equipment is scattered in too many small rooms with inefficient space utilization. If possible, several partitions should be removed to combine adjoining rooms. Reassignment of equipment should be made with more efficient laboratory benches. This will provide greater utilization and better control over the students by the instructor. Present conditions cause overcrowding and dispersion of equipment into the many smaller rooms.

VIII. Mechanical.

Laboratories are in three different areas. Casting, forging and machine shops are in Area #5. Materials testing, air conditioning and stress analysis laboratories are in Bldg. #1. The internal combustion engine laboratory is in Bldg. #3.

Two new laboratories will be established with equipment now on order. They are the turbine laboratory in Bldg. #3 and the vibration laboratory in Bldg. #1.

IX. Metallurgy.

The laboratories are in Bldg. #2 and Area #5. Non-ferro, X-ray, physical, finishing, fire assay, casting, electro are on the second and third floors of Bldg. #2. Welding, refractory and ore dressing are in Area #5.

X. Mining.

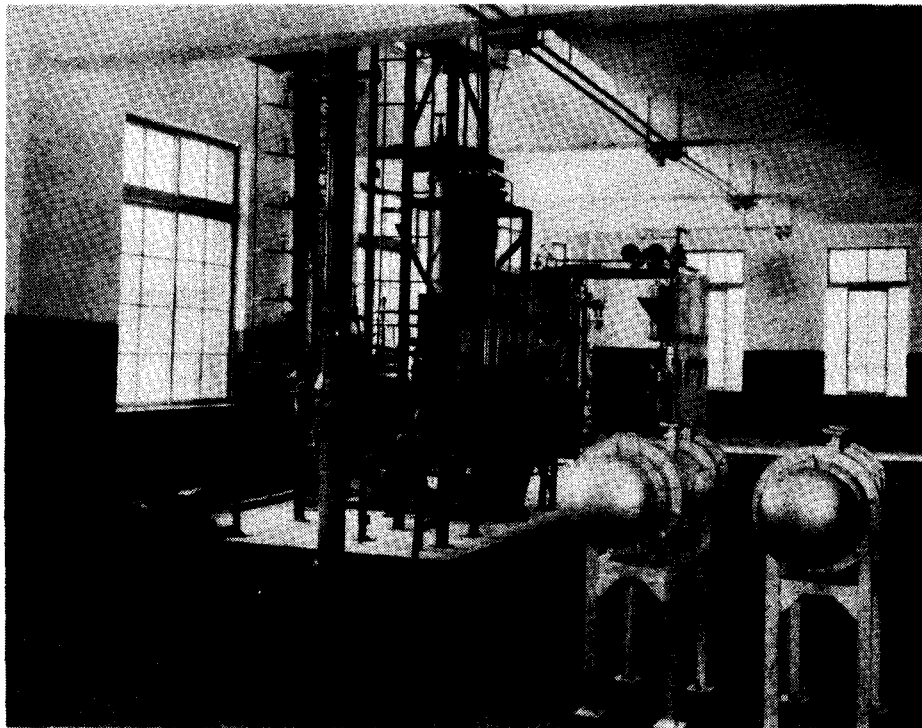
This department is now well equipped and well organized. The entire department with all offices and laboratories is concentrated in Area #5. It is the only department with light fixtures installed throughout. The following buildings are in use for mining #5-1, 5-2, 5-3 and 5-15.

XI. Naval Architecture

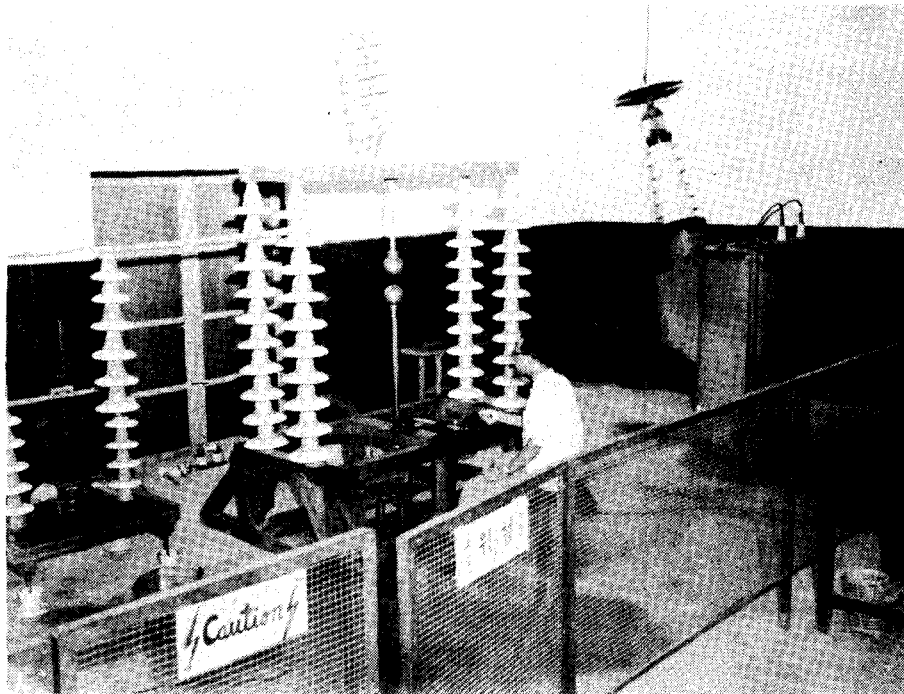
The department has two laboratories in Bldg. #1, namely photo-elastic and the stability demonstration. It is completing installations for a large towing tank in Area #5.

XII. Textile.

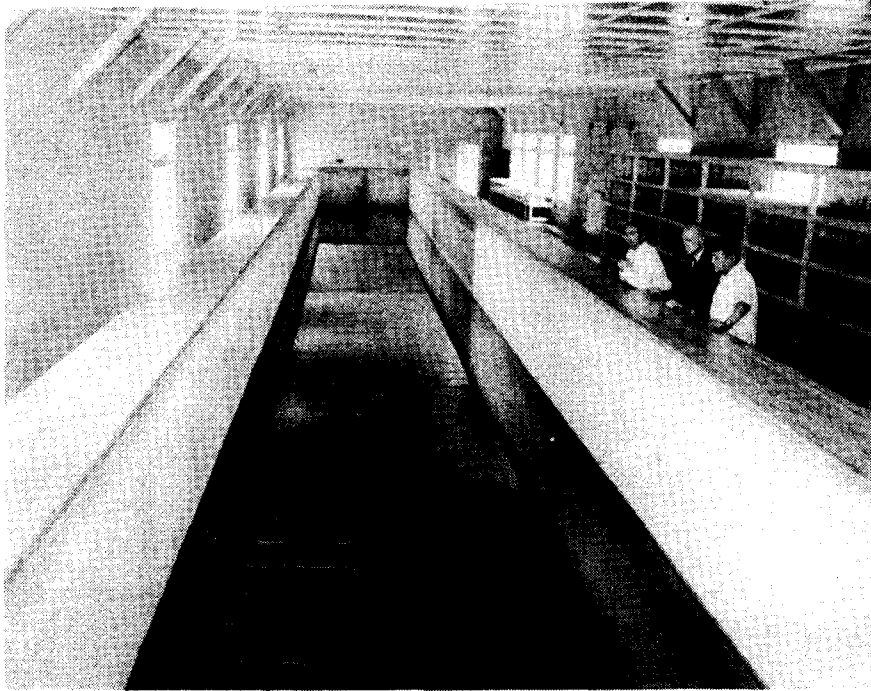
This department has laboratories in Bldg. #1 and Bldg. #4. Additional floor space will become available when the Atomic Energy Commission moves out of temporary quarters that they are now occupying in Bldg. #4. They equipment for the principal laboratories has been placed on order with expected arrival of the greater part early in 1960. Sources of steam and gas for operating the equipment must be obtained as soon as possible. The staff, with the assistance of the adviser in textile engineering, should initiate floor plan layouts to insure that all equipment will be systematically installed when it is received. Air conditioning of one room (approx. floor area 900 sq. ft.) will be needed. Plans for this should be worked out with the Mechanical Engineering Department.



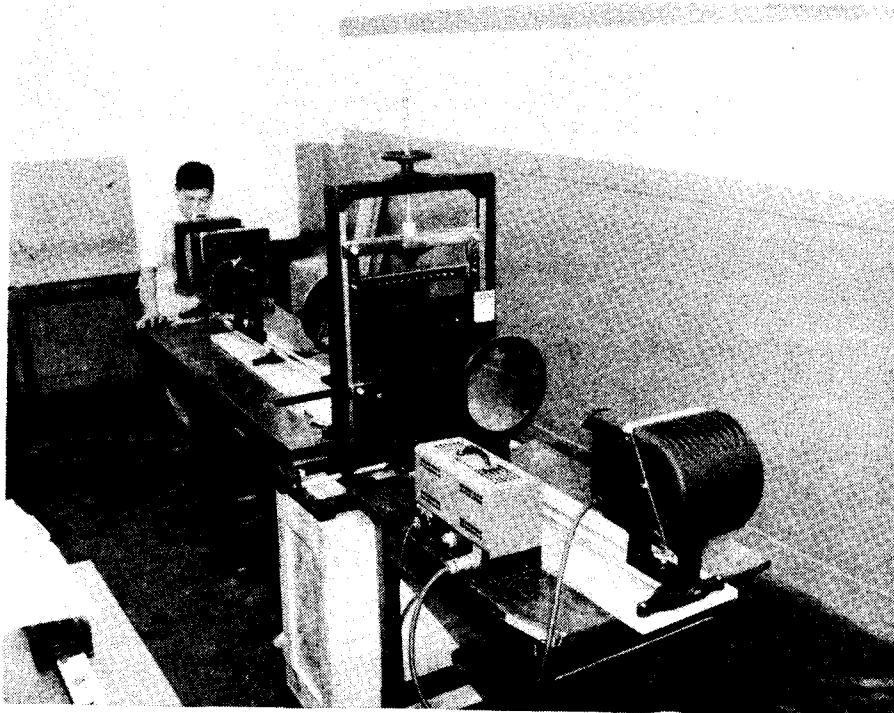
Unit Operations Laboratory  
Chemical Engineering



High Tension Laboratory  
Electrical Engineering



**Towing Tank  
Naval Architecture**

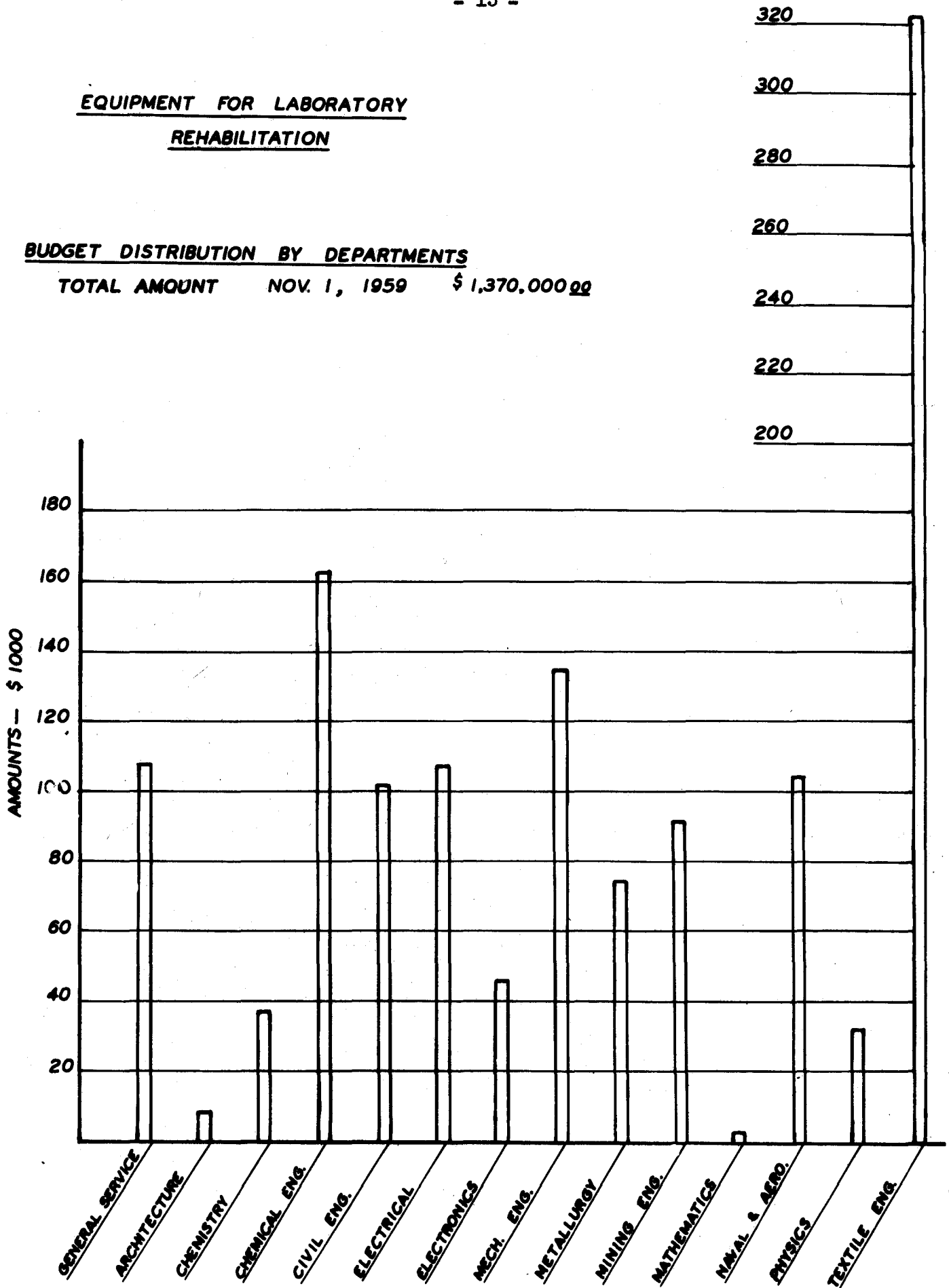


**Photo-Elastic Stress Analysis  
Aeronautical Engineering**

EQUIPMENT FOR LABORATORY  
REHABILITATION

BUDGET DISTRIBUTION BY DEPARTMENTS

TOTAL AMOUNT NOV. 1, 1959 \$ 1,370,000.00





XIII. Nuclear Engineering.

This department was formally established on September 1, 1959. It is at present occupying four empty rooms on the third floor of Bldg. #1. The faculty consists of one member. The equipment needs for this department have not been formulated.

5. Library

The Engineering Library consists of a large reading room seating about 100 on the first floor of Bldg. #1 and book stacks and workroom space on the second floor of the same building. A private stair connects the two rooms. The reading room is well equipped with fluorescent lights, tables, chairs and shelves.

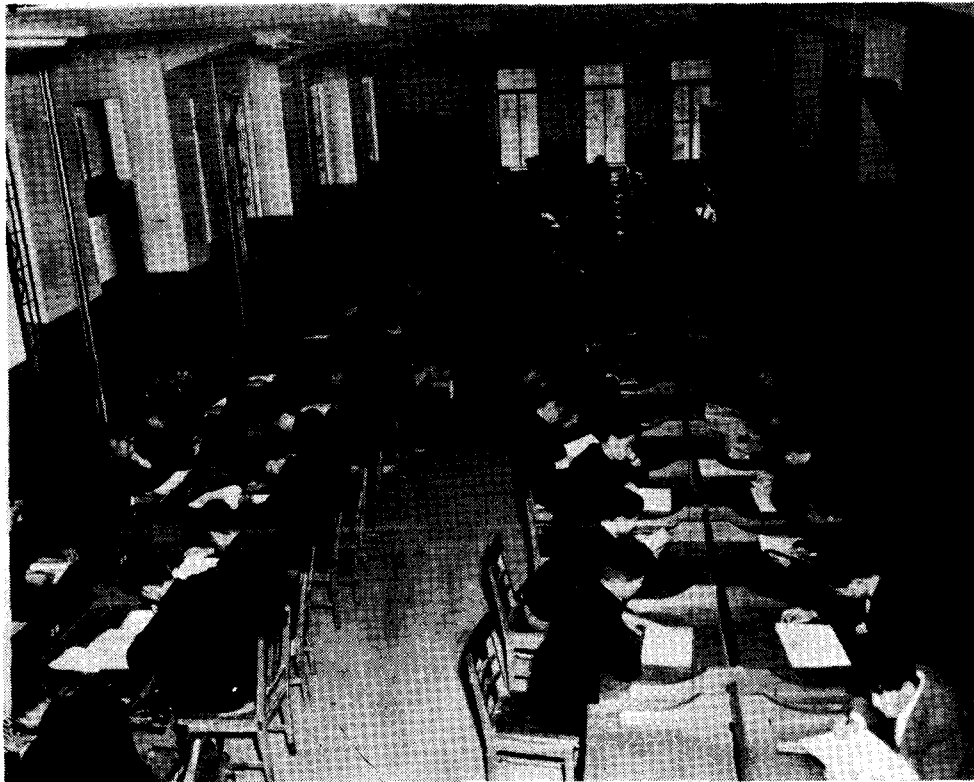
The collection (Nov. 1959) consists of 15,538 books of which 5511 are in oriental languages (Japanese, Korean and Chinese) and 10,022 in occidental languages (English, German, French, etc.). In addition to these bound volumes, there are also (Nov. 1959) 10,987 unbound periodicals.

Since the inception of the contract the number of books has increased by almost 70 per cent as shown on the chart showing reading and book purchase statistics, which also indicate the growing use of the library. The increase in the number of borrowings is shown on the second chart according to student rank over a period of four years. On the third chart is shown the number of borrowings broken down in accordance with the various departments, and for the two years of 1957 and 1958.

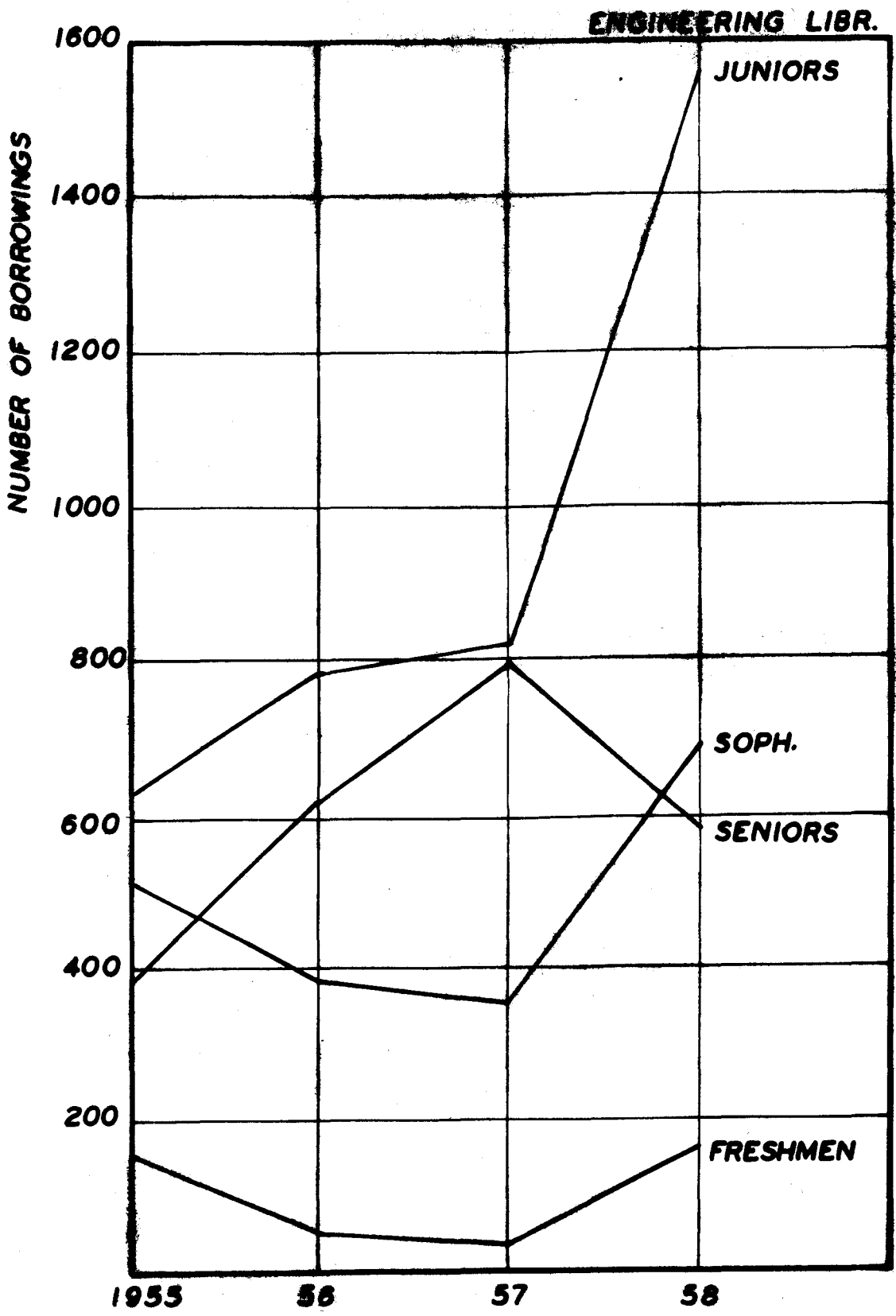
The Engineering Library was studied early in the contract period by Harald Ostvold, Adviser in Library Science. He noted the lack of proper cataloging, noted the concentration in the Japanese language, and criticized the lack of training among the personnel.

The library has under the contract developed a complete and efficient catalog. All books are listed under author in one section and under title in another. The books are placed on the shelves according to classification number. The number of bound volumes and periodicals have increased materially under the Minnesota contract, as shown on the charts that follow.

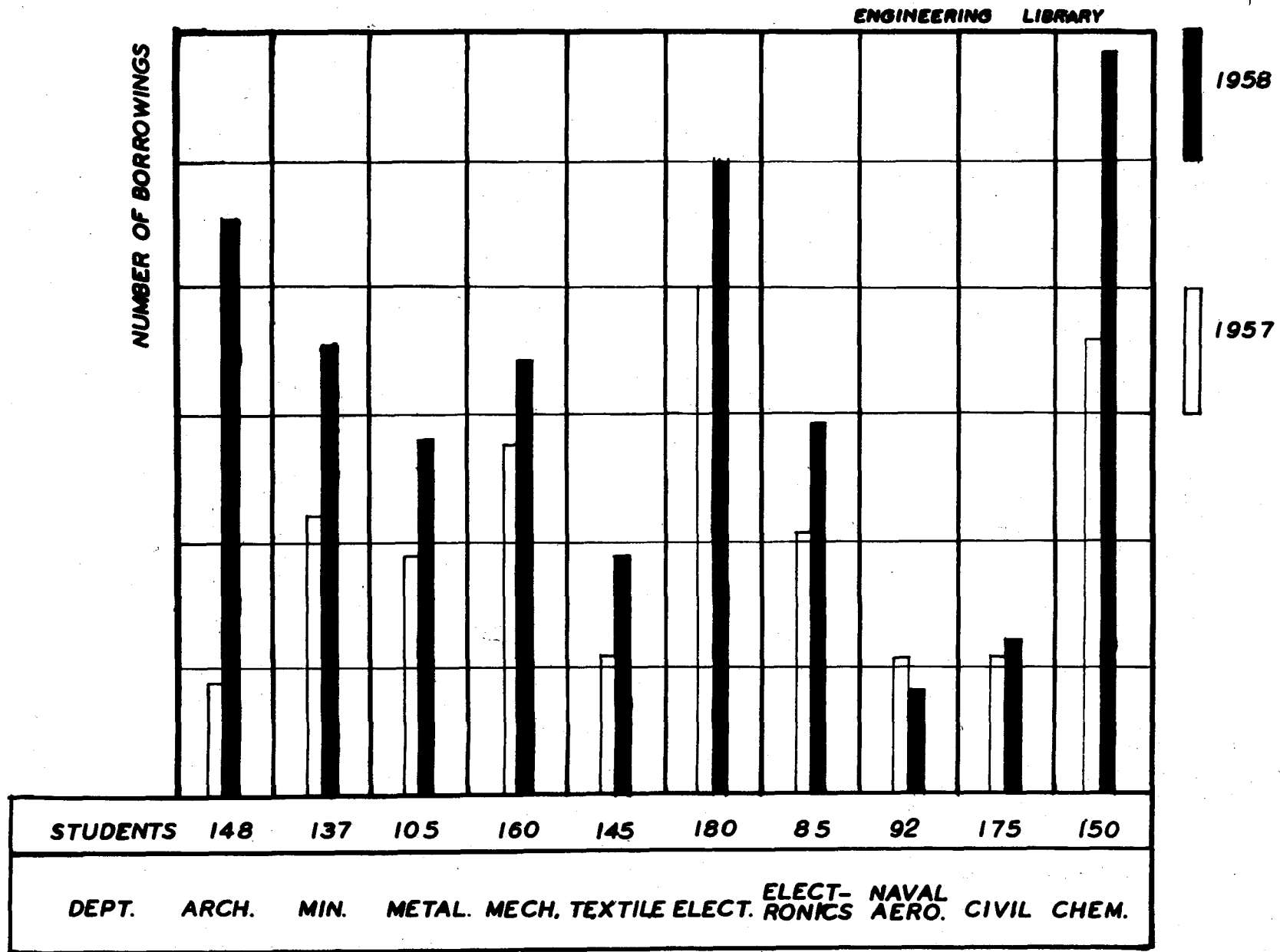
The Engineering Library is a going concern and an important part of the College. The faculty members realize this and are anxious to strengthen and enlarge it. This expansion can not be long delayed, and will be discussed elsewhere in this report.



Reading Room in Engineering Library

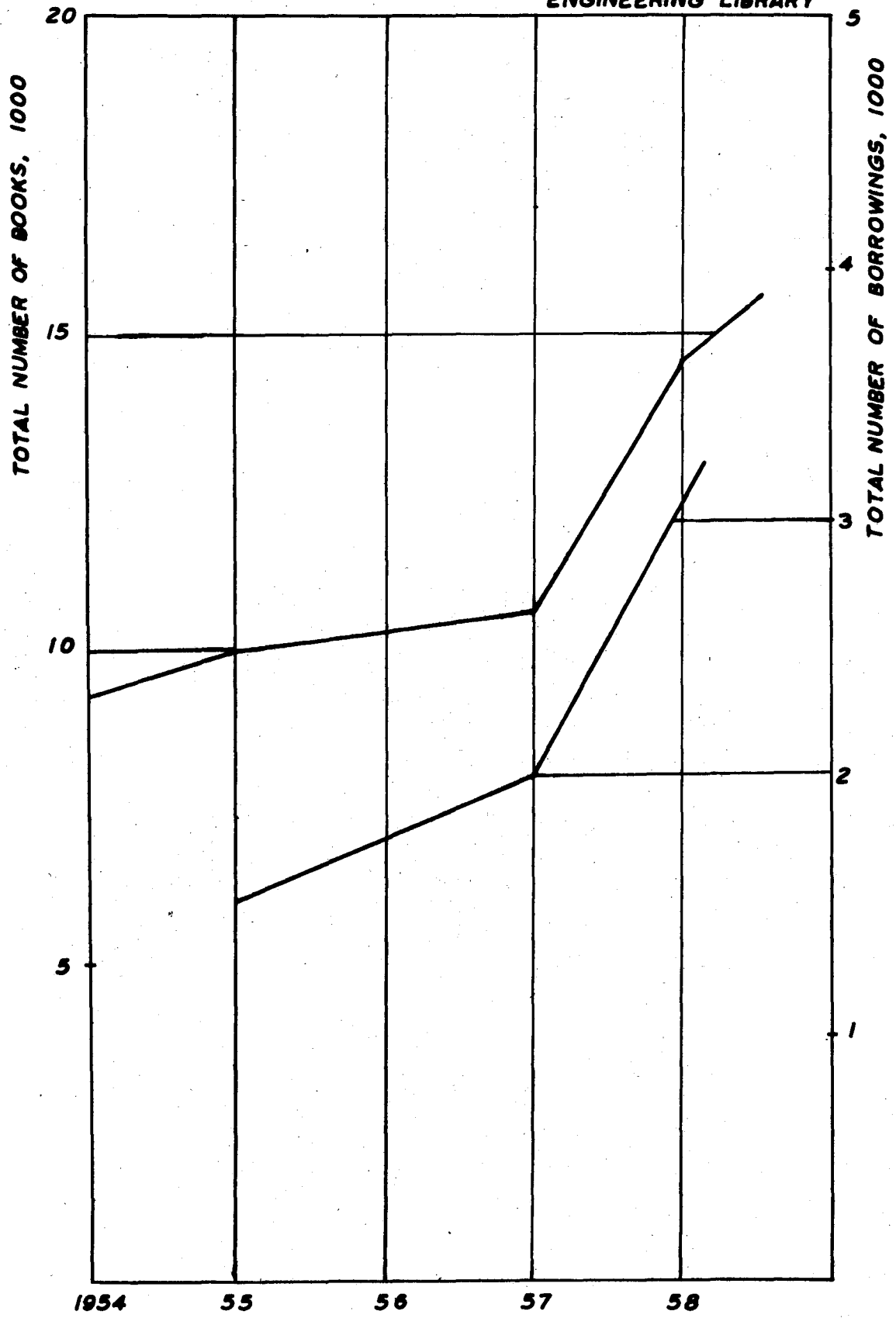


**READING STATISTICS ACCORDING TO STUDENT RANK**



**STATISTICS OF DEPARTMENTAL READINGS**

ENGINEERING LIBRARY



READING AND BOOK PURCHASE STATISTICS

6. Admission of Students

Students who wish to enter the Engineering College must pass an entrance examination which is held every year during the first week of March. The number of applicants is many times larger than the number of selections. In 1959 a total of 2200 registered for the examination and only 395 were admitted into the College. A large number of those with lower scores usually gain entrance into Inha Institute in Inchon, Hanyang Institute in Seoul and Yonsei University. The applicants express at the time of registration as first, second and third choices the departments they wish to enter. The quotas of the various departments are filled accordingly.

A special examination is held each year for graduates of the Korean Military Academy, the Naval Academy and the Air Force Academy. The candidates are commissioned officers and usually enter the College with junior standing and are thus able to complete the work for the bachelor's degree in two years after entrance.

7. Curriculum

The Engineering College offers four-year curriculums which lead to first degrees in the various phases of engineering. The work during the first year, as far as subjects are concerned, is the same for all students. The freshman year covers the fundamentals in mathematics, physics and chemistry and, in addition, training in languages and the humanities.

The sophomore year covers the advanced mathematics and physics and intermediate and introductory engineering subjects. The junior and senior years are devoted exclusively to professional subjects of

the various branches of engineering.

The instruction in English is very good, but the number of hours assigned to the teaching of this subject is insufficient. English has become an important language in Korea, both on and off the campuses. One needs only to walk through libraries in all parts of Korea to realize this. Most other universities place much greater emphasis on English than does the Engineering College. Both Inha Institute of Technology in Inchon and Hanyang Institute in Seoul require two years of English, where only one year is required at the Engineering College. This deficiency in English is realized by the many students to whom the adviser has talked. On Nov. 18, 1959 students formed an English-speaking club for the purpose of gaining proficiency in this language.

A study of the professional part of the curriculum reveals two prominent features. The first is the extremely limited amount of laboratory work which is offered. The second is a "spreading out" of subjects, usually taught in one semester, over several. An example of a typical curriculum (Mech. Eng., Junior Year) is shown on the following page. The number of courses is ten in each of the two semesters, and only those hours marked with an asterisk are spent in the laboratory. That is 8 hours out of 29 hours in the first semester and 6 out of 29 in the second semester.

It is imperative that prospective engineers receive training in the actual handling of problems of design, operation and construction. The laboratory and the practice drafting room constitute an indispensable part of engineering instruction. The faculty members agree, but point, very frankly, to the personnel problem that has, so far,

CURRICULUM, MECHANICAL ENGINEERING

Junior Year

<u>Requisite</u>	<u>1st Semester</u>		<u>2nd Semester</u>	
	<u>hrs/w</u>	<u>Credit</u>	<u>hrs/w</u>	<u>Credit</u>
Strength of Materials	3	3		
Material Testing Laboratory	2*	2		
Heat Transfer	3	3	2	2
Fluid Machinery	4	4	2	2
Drawing of Machine	4	2	6*	3
Mechanical Engineering Laboratory	6*	2		
Design of Machine	2	2	3	3
Steam Power	2	2	3	3
Internal Combustion Engine			3	3
Machine Tools	2	2	2	2
Electric Engineering			2	1
Mechanical Technology			2	2
	<hr/>		<hr/>	
Total	27	22	27	23
<u>Elective</u>				
Advanced Calculus for Engineers	2	2	2	2
Electric Engineering (General)	2	2	2	1
	<hr/>		<hr/>	
Total	4	4	4	3



prevented this from being put into effect.

The problem is briefly, that in order to conduct laboratory classes the staff members would have to remain on the campus for considerably longer time than they do at present, and thus be prevented from augmenting their university salaries by earnings from other sources.

The salary problem is also the real reason for the multitude of courses which crowd the curriculums. Consolidation of courses would increase the number of hours required for each course. This, in turn would necessitate scheduling a lecture for a particular course, and would require the presence on the campus of the instructor every day of the week. The instructor would not have any full days without teaching hours that could be spent at some other place of employment.

#### 8. The Graduate School

The Engineering College is primarily an undergraduate institution, but some graduate instruction is carried on in the individual department. The total number of graduate students (Nov. 1959) is 35.

Students wishing to take graduate work in engineering must possess a bachelor's degree. They register on the main campus in the office of Graduate Dean Lee, Byong Do. The registrants must pass a graduate school entrance examination usually held around the middle of March. The number passing is roughly one-third. The Engineering College will admit a limited number to each department (usually 3 to 4).

The graduate instruction consists of conferences with the staff members appointed by the department supplemented by reading assignments. Most graduate students take two years to complete the work for the master's degree. Reports and a thesis must be completed before the

candidate appears before an examining committee consisting of three staff members from the major department.

It is of interest to note that tuition fee for graduate work is the same as for undergraduate residence, namely HW. 75,000.00. It is also of interest to note that staff members receive additional compensation for graduate instruction. An assistant professor may earn a lecture fee of HW. 900.00 per week; an associate professor two such fees and a professor three times this amount.

#### 9. Research

Technological research is a necessary function of an engineering college. By engaging in regular research work the faculty members can continue their own development and growth. They will be able to keep abreast of new methods, techniques and inventions and thus bring stimulus and incentive to their students and professional colleagues.

There is a realization of this among the staff members and many of them have a strong desire to include in their programs research projects which will serve primarily the needs of the Korean economy. There are available equipment and trained personnel capable of such undertakings.

There are at present considerable research activities at the Engineering College. A survey has disclosed 21 projects, recently completed (this year), currently active or in the planning stage. Of these, 9 projects are sponsored by private organizations and 12 are endorsed by various agencies of the Korean Government. These projects are listed in the table which accompanies this section. It should be noted that the Departments of Mining and Chemical Engineering are

particularly active in research.

In the case of the government sponsored projects, arrangements for disbursement of funds are made through the College. The faculty member in charge of the project does not receive any additional compensation. He is usually required to teach his full quota of lectures and laboratory classes in addition to the work involved in setting up testing equipment, collecting and processing experimental data. There is considerable dissatisfaction with this arrangement.

In the case of private sponsorship, the company or organization makes all the arrangements with the department and the cost of the project is paid directly to the staff member in charge who, in turn, will purchase necessary supplies, hire assistants and also retain a fee for his services. Thus, research projects for private companies gives the staff member income in addition to his regular college salary.

There can be little doubt that the impending completions of important laboratories (hydraulic, towing tank, wind tunnel, unit operations, etc.) together with the increase in the number of staff members trained in United States will in the future attract more research projects to the College.

RESEARCH PROJECTS - COLLEGE OF ENGINEERING

Revised List - Oct. 7, 1959

<u>Dept.</u>	<u>Project Title</u>	<u>Cost (HW)</u>	<u>Sponsor</u>	<u>Staff Member</u>	<u>Remarks</u>
1. Mining	Magnetic Survey of Yangyang Iron Deposit.	500,000	Daihan Iron Co.	Kim, Dong Kie	Current
2. "	Physical Properties of Coal & Coal Rock	70,000	Daihan Coal Corp.	Song, Tae Yoon	Completed
3. "	Preparation of Changsung Coal	100,000	Daihan Coal Corp.	Song, Tae Yoon	Completed
4. "	Geol. Survey of Kimhae Lead & Zinc Mine	200,000	Kimhae Lead & Zinc Mine	Song, Tae Yoon Kim, Dong Kie	Current
5. "	Electric Prospecting of Hamback Coal Field	400,000	Daihan Coal Corp.	Hong, Choon Ki	Completed
6. "	Properties of Mine Rocks	200,000	Kangwon Coal Mine	Kim, Dong Kie	Planned
7. "	Elec. Properties of Coal Rocks	100,000	Kangwon Coal Mine	Hong, Choon Ki	Completed
8. "	Improvement of Coal Prep. Process of Anthracite	7,000,000	ROK Government	Song, Tae Yoon	Planned
9. Electr- onics	Transistoriz- ation of Timing Circuit	1,000,000	ROK Government	Lee, Chung Han	Current
10. "	Measurement of height and characteristics of ion layer	1,000,000	ROK Government	Park, Ki Soo	Completed
11. "	High Frequency Heating	1,000,000	ROK Government	Lee, Jae Kun	Completed

<u>Dept.</u>	<u>Project Title</u>	<u>Cost (HW)</u>	<u>Sponsor</u>	<u>Staff Member</u>	<u>Remarks</u>
12. Aero	Performance of Liquid Fueled Rocket	5,000,000	ROK Air Force	Wie, Sang Kyoo	Planned
13. "	3-Stage Solid Fueled Rocket	200,000	ROK Dept. of Defence	Hahn, Mansop	Current
14. Mech.	Insulation of Bldg. Wall	7,000,000	ROK Government	Kim, Hyo Kyung	Planned
15. Metallurgy	Research on Fluxing	-	Samsung Mining Co.	Park, Ryung Choo	Planned
16. Chem.	Gasoline from Anthracite	1,000,000	Tonghae Industrial Co.	Lee, Chae Sung	Current
		2,000,000	Hantaе Coal Mine		
	1. Fixed Bed Gasification of Granular Anthracite	3,000,000			
	2. Manufacture of Catalyst Test Pilot Plant				
17. "	Gasoline from Anthracite	7,000,000	ROK Government	Lee, Chae Sung	Planned
	1. Fluidized Bed Gasification of Powered Anthracite				
	2. Catalyst Preparation				
18. "	Induction Phenomena of Insulating Geramics	1,000,000	ROK Government	Lim, Eung Kuck	Planned
19. Civil	Silting in Korean Streams	1,000,000	ROK Government	Ahn, Su Han	Planned
20. Elect-	Vacuum Tubes for Electric Power	1,000,000	ROK Government	Chi, Chul Kon	Planned
21. Naval Arch.	Resistance of Korean Trawl Ships	1,000,000	ROK Government	Kim, Cheung Hun	Planned

10. Physical Plant

The physical plant of the Engineering College is, or will soon be, concentrated in three main areas. Buildings No. 1,2,3 and 4 comprise one group dominated by No. 1 and 2, in which all the department heads, except mining, have their offices. The dean's office is on the second floor of Bldg. #1. In Bldg. #3 is located the central heating plant for this area, as well as electric power equipment, maintenance drafting room, shops and repair facilities, store rooms and also laboratories of the mechanical engineering department. In Bldg. #4 are located laboratories of the electrical and textile engineering departments and also the temporary quarters of the Atomic Energy Commission. This group of buildings is well equipped with steam heat, water, electric lights and telephone service.

The second group of buildings is known as Area No. 5 and is located south-east of the first group. Area No. 5 was severely damaged during the Korean War, and four years ago (1954) it appeared questionable that the group could be economically restored. The 17 buildings of this group have now been fully repaired, several of them are in service and others are being readied for use. The group has its own heating plant in Bldg. #5-9. Water is available in most of the buildings, electric lights and telephone service in some of the units.

The sanitary facilities in Area No. 5 are totally inadequate for the number of people daily occupying the buildings. There is only a limited number of outdoor non-flushing toilets. This situation requires immediate attention and correction.

The Department of Mining Engineering occupies more space in

Area No.5 than any other department. Buildings 1,2,3 and 15 are part of mining. A large room in Bldg. 13 will serve as an explosives laboratory for mining.

The new dormitory buildings, when completed, will form a third group. The eight buildings will when completed accommodate 600 students and 16 single faculty members. The dormitories will have kitchen, dining and recreational facilities for resident and non-resident students. They should be ready for occupancy by August 1960. Their completion will mark a long step forward in building up a community of students and faculty members around the College of Engineering.

The College receives electricity from Korean Electric Power Corporation. The power is transmitted through high tension lines (3300V) and transformed to lower voltage (110V). There are frequent power breaks which interfere with operation of laboratories and utilities. In order to alleviate this situation two standby Diesel generator units are being installed in Building No.3 and another set of two units will be placed in the utility building of the new dormitories.

A serious erosion problem confronted the College three years ago. During its occupation of the campus the American army conducted training for its personnel in operation of tractor vehicles on the sloping ground north of Building No.4. As a result the protective cover of shrubs, bushes and plants was removed and erosion followed. This erosion spread into the campus area and began to engulf and undermine Building No.4.

This critical situation has recently been checked by the

construction of a dam running east and west, terracing of the slopes and systematic planting of the reconstructed surfaces.

At the present time the College employs 19 guards and watchmen to protect its property. In order to augment the protection of buildings and equipment a security fence of reinforced concrete and steel is now under construction. The fence is being constructed in sections with funds left over from the annual budget. It will be supplemented by gates and guard houses. Another security measure is the systematic installation of iron bars on all first floor and basement windows.

The Engineering College is supplied with water that comes from wells on the banks of the Choongrang-chun, a small stream about one and one-half south of the campus. The system will be augmented in the near future with a new well, two additional electrically driven pumps and new pipe lines from the wells to the reservoir located 180 feet above the water surface in the north-eastern part of the campus. New distribution lines will also be constructed from the reservoir to the buildings.

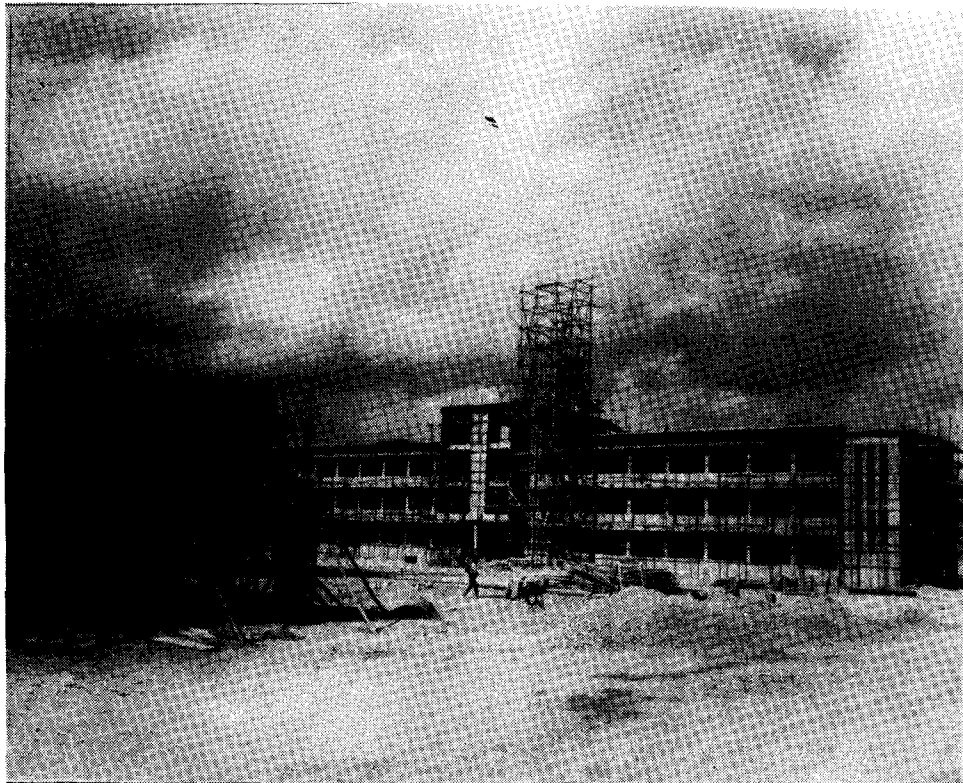
Gas was formerly produced in a central plant from imported bituminous coal, but the generating facility was completely wrecked and looted and has not been repaired. It is the only grim reminder of the recent war. Gas in the various laboratories is now produced by electrically operated devices, which generate a mixture of gasoline vapor and air. There appears to be no need for a central gas producing plant.

The roads on and leading to the campus are in need of repairs. Although not as pressing as other problems, restoration of roads and bituminous surfacing should be given attention in future planning.

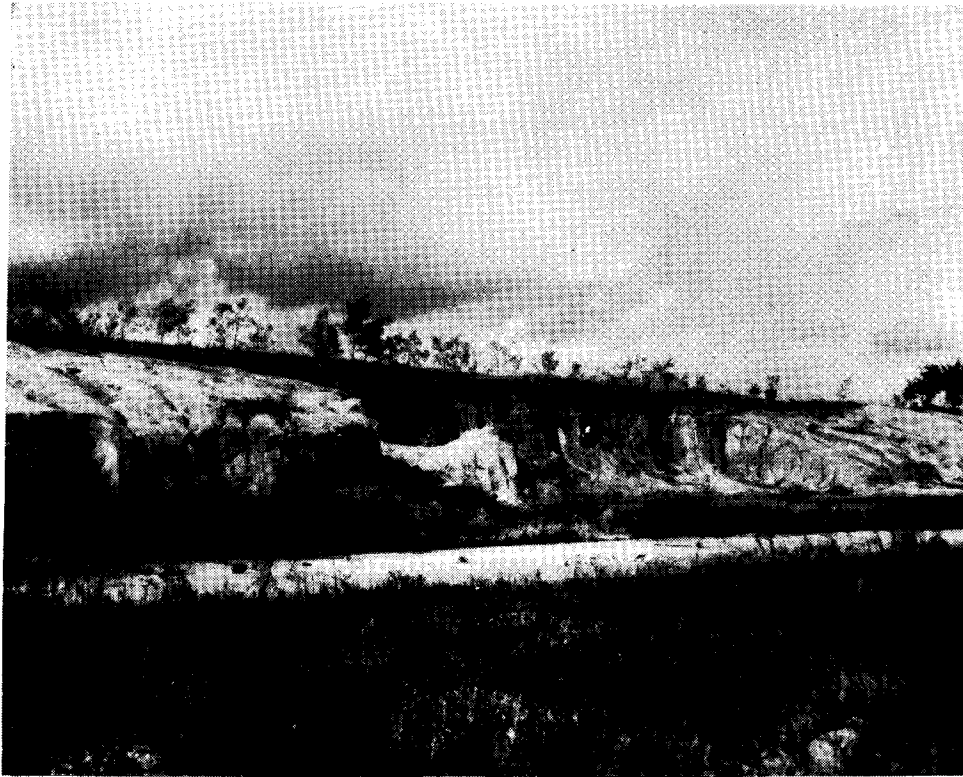




Security Fence around Campus



Dormitories under Construction



Erosion of Bank on Campus



Erosion Control behind Bldg. 4

11. Personnel

The faculty of the Engineering College consists of two classes of appointees. The Dean, administrators, Professors, Associate Professors, Assistant Professors and Instructors have permanent positions, often referred to as T.O. (table of organization). These positions carry tenure and monthly salaries for the entire calendar year. There are at present (Nov. 1959) 82 in this category distributed as follows: Professor - 25; Associate Professor - 17; Assistant Professor - 25; Instructors - 15.

The other class of appointment is temporary or non-T.O. In this class are lecturers and assistants. They are appointed by the Dean and approved by the President of the University. These temporary appointees are paid for the actual number of contact hours with students in lecture classes or laboratories. There are at present 57 in this category.

All faculty members, whether regular or temporary, are permitted to supplement their earnings by compensations for work outside the College. There is considerable demand for their services, and practically every one is engaged in outside activities of some kind. The teaching programs are usually arranged to allow several days free of classes, that can be devoted to off-campus obligations.

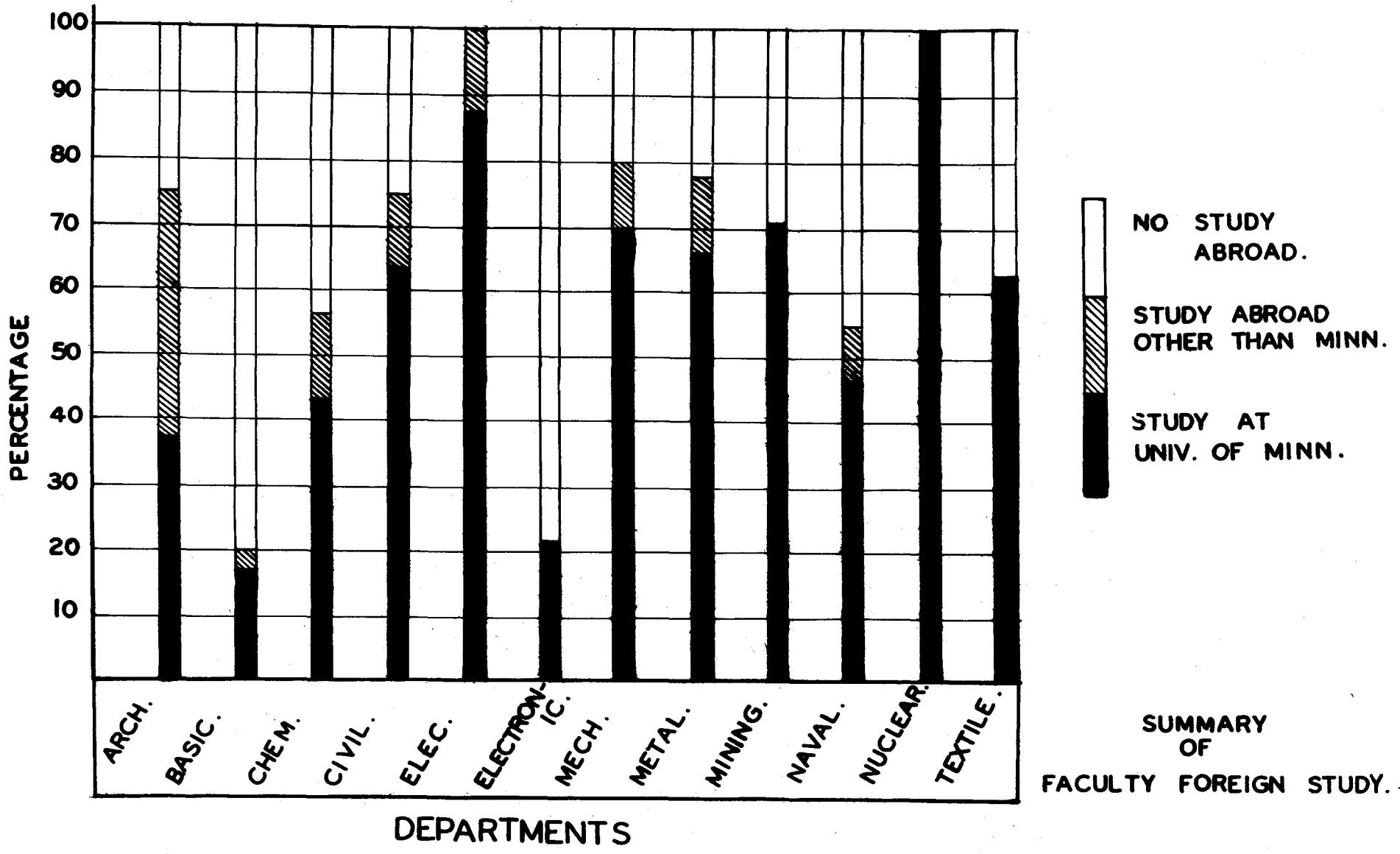
An important part of the Minnesota contract has been the attempt to upgrade the faculty by training and study in United States. It was felt that the staff was in need of experience in modern technological education and the broadening and professional maturity that would be the result of periods of study at American universities. It was this opinion, together with the belief that the faculty is the most important part of

any college, that made the staff training plan the most significant part of the project. The original plan called for United States training of a considerable proportion of the faculty, while at the same time a large group of key men would be on duty at the College. It also provided for a sliding scale of training. It was planned to give the young men (under 30 years of age) two years of regular study, the middle group (30 to 40 years) were to receive one year of study, and the senior group (over 40 years) to have six months of observation and study under a specially designed program.

The number of participants from the Engineering College is at present 61. Of these 49 have returned to their original appointments or been appointed to regular positions shortly after their returns. Twelve are in United States completing their studies and observations. The participants from the Engineering College have earned advanced degrees during their periods of study: 14 have received Master of Science degrees, and 3 have been awarded both Master's and Doctor's degrees.

It is of interest to note that the first and second of the Ph.D. recipients (Choi and Lee) each spent three years and three months in residence at University of Minnesota, and Mr. Hahn four years in order to satisfy academic requirements.

The chart that follows indicate the extent to which each of the twelve departments has shared in the staff participant training in United States. It should be noted that the Nuclear Engineering Department, which is newly established has only one staff member, and the Basic Instruction Department has a large number of instructors in non-engineering subjects (social sciences, the humanities, etc.) who do not participate in the program.



SUMMARY  
OF  
FACULTY FOREIGN STUDY.

## 12. The Over-all View

The foregoing study has dealt with conditions as they exist today at the Engineering College. Its purpose is to offer a background for an understanding of what has been done and what can be done in solving the problems of the College.

The first impression of a visitor returning after an absence of three years is one of pleasant surprise. Buildings are rehabilitated, laboratories have equipment, classes are in sessions, students are studying in classrooms and library, staff members are scurrying. Great strides have been made.

There is now a large amount of laboratory equipment on hand, and in another year there will be an abundance. To be sure, which has been procured is not properly balanced. As shown on page 13 textile engineering has, in terms of monetary value, received the lion's share. A wind tunnel and a towing tank have been procured, but there are, as yet, no detailed plans for a hydraulic laboratory so essential to all branches of engineering.

To fully use the equipment, which has been procured, for classes, for demonstrations, for research, and to maintain it will require constant efforts. At the present time this equipment, or most of it, is not being effectively used. There are not enough laboratory hours scheduled for the upperclassmen. On page 21 is a sample curriculum (juniors, mech. eng.). Only 8 hours in the first semester, and 6 hours in the second semester (both out of 29 hours) are spent in laboratory classes. Many departments offer less than that, but there is reason to believe that this situation will be gradually improved, as the staff members gain in experience and self-confidence.

A constant complaint of all advisers has been too many course offerings of only a few hours each. This is true. George D. Stoddard\* stated earlier this year that this had been changed and the number of courses required to be taken by a student each week has been reduced from 16 to 8. There is no evidence of this. As far as the faculty is concerned there are definite and compelling reasons for the large number of course offerings (see page 22), and it is doubtful that there is any great disadvantage in the system. An examination of the curriculums of Han Yang Institute of Technology and Inha University will reveal similar patterns.

The large number of departments has been questioned by some advisers, while others have criticized the separation of electronics from Electrical Engineering. Actually, the number of departments is such, that they accommodate approximately the same number of students. Any consolidations would result in some very large departments.

The remoteness of the College from any good residential area results in a dominance of its activities by the transportation situation. The effect is a short working day. Classes begin at 9 a.m. and are over by 4 p.m. This is compensated for, to some extent by Saturday classes, which are conducted in all departments from 9 a.m. until 1 p.m. and in at least four departments (mech., electr., chem., textile) classes run through that afternoon until 4 p.m.

What is the situation with respect to the placement of the

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\* REPORT OF ICA CONSULTANT ON HIGHER EDUCATION IN KOREA WITH SPECIAL REFERENCE TO SNU AND CONTRACTS BETWEEN ICA AND U.S. UNIV., 10 April 1959. page 16

graduates of the College? It is very good. More than 80 per cent have accepted positions before their graduation and all are gainfully employed or fulfilling their military obligations a few weeks after. As one staff member remarked recently: of all the colleges of SNU, engineering is the best seller.





## II. ACTIVITIES OF ADVISER

### 1. Introduction.

The writer of this report is referred to as the adviser. Actually, he has done very little advising except perhaps in this report. He has acted as a liaison man between the College and the Office of the Chief Adviser on the Main Campus and between the College and the Institute of Technology of the University of Minnesota. His extra-curricular activities have been numerous: he has lectured to students and faculty on research, engineering and campus life in United States; he has spoken at professional and social gatherings on and off the campus; he has briefed participants before their departures for Minnesota and seen them off at the airport; he has conducted tours of inspection of the College for American, Korean and foreign visitors.

The main functions of the adviser have included: approval and expedition of equipment lists; specifications for expansion of library facilities; improvements of the water supply system and electric power supply system; development of the graduate school of the College. A brief account of these activities will be given in the following.

### 2. Equipment Lists.

When the adviser arrived in Korea on July 11, 1959, available equipment budget allowances were as follows:

F.Y. 1958 .....	\$105,371
F.Y. 1959 .....	70,000
F.Y. 1960 .....	80,000

In estimating the F.Y. 1958 figure allowances had been made for the following subsequent releases, which were made on October 5.

Electrical Engineering .....	\$ 9,731
Mechanical           " .....	15,881
Special Met. Eng.       .....	<u>5,128</u>
	30,740

On October 16, a list of supplementary equipment for the Mechanical Engineering Department was released; the amount was \$35,484. On October 20 an order for a wind tunnel balance was issued; the amount was \$12,500. Thus, the unencumbered balance for F.Y. 1958 is now reduced to \$57,387. This amount has been earmarked for additional needs of the textile engineering department.

The pumps, pipes, valves and accessories for the water supply system will require an estimated outlay of \$50,762, and the expansion of the library will necessitate an expenditure of \$18,320. The sum total of these two items \$69,082 will almost exhaust the F.Y. 1959 budget allowance of \$70,000.

In checking the dimensions of the wind tunnel for the Aeronautical Engineering Department it was found that the floor area assigned to it in Building No. 5-11 was insufficient for installation and operation. In order to increase the space in this building an addition must be made to it. Proposed arrangement and dimensions are shown in Appendix 2 of this report.

### 3. Library.

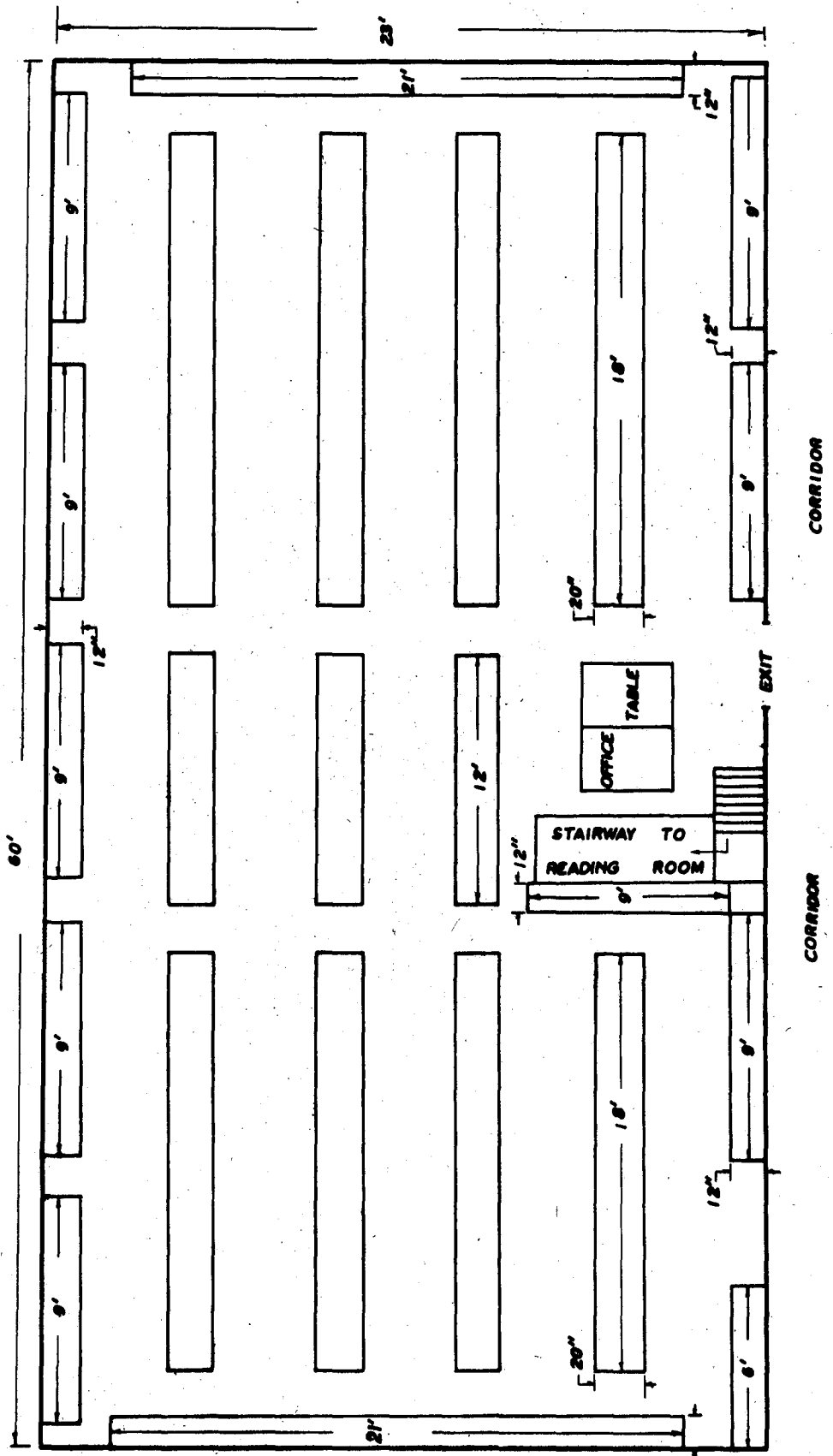
For some time it has been apparent, that the storage space for books and periodicals is not sufficient to take care of the many new additions, which are arriving regularly and the many more that will come regularly. In order to formulate definite plans for the library, a committee was appointed by the Dean on Oct. 27, 1959. The committee will

discuss with the adviser means of increasing the physical facilities of the library as well as acquisition of books and periodicals.

The following is a list of faculty members serving on this committee.

1.	Hong, Soon Bok	Assist. Prof.	Basic
2.	Chun, Byung Doo	Instr.,	"
3.	Yun, Jang Sup	"	Arch.
4.	Shim, Chung Sup	Assoc. Prof.	Chem.
5.	Choi, Jong Wan	Assist. Prof.	Civil
6.	Park, Min Ho	" "	Elect.
7.	Choi, Keh Kun	" "	Electro.
8.	Suh, Chai Chin	" "	Mech.
9.	Kim, Tong Hoon	" "	Metal.
10.	Kim, Dong Kie	Instr.,	Mining
11.	Wie, Sang Kyoo	"	Naval
12.	Han Bong Hee	Assist. Prof.	Nuclear
13.	Kim, No Soo	" "	Textile
14.	Kim, Cheung Hun	" "	Libr.

The committee has recommended, and the adviser has requested that the existing wood shelves be replaced with steel book stacks of design and arrangement which will almost double the storage capacity. It is also planned to move the catalog cases and charging desk to the reading room which is located on the first floor directly under the stack room. The proposed arrangement of book shelves is shown on the following page. An allocation of \$18,320 has been requested for purchase of shelves and catalog cases.



FLOOR PLAN OF LIBRARY  
STACK ROOM

4. Physical Plant.

(1) Area No.5.

During the adviser's tour of duty full restoration has been made of the buildings in the group known as Area No.5. Three years ago it was considered doubtful economy to attempt repairs of this group. All buildings have now been restored and assigned to the various departments. Occupancies of the seventeen main units in this area are shown in Appendix 1.

The adviser has supervised the completion of installations in the Unit Operations Laboratory of the Department of Chemical Engineering in Building #13 of Area No.5. He has also submitted plans for enlarging Building #11, which will house the wind tunnel for the Aeronautical Engineering Department. The proposed addition and alterations of this unit are shown in Appendix 2.

(2) Emergency Power Plant.

Perhaps the most pressing of all the problems at the Engineering College is that of securing a steady and dependable supply of electric power. Interruption of this supply is an almost daily occurrence, and the duration of the break may vary from 2 to 48 hours. The most serious consequence of a power break is the interruption of laboratory classes, which all depend on electricity. During the months of September, October and November 1959 more than 25 per cent of regularly scheduled laboratory classes were cancelled due to lack of electric power. If the breaks are prolonged they interrupt the supply of water. As soon as the water storage reservoir is exhausted, the campus pump must replenish it; if electric power is not available, it is unable to do this.

Recently, accessories and equipment for installation of two

150 KW Standby Diesel Generators have been procured. They will be installed in Building No.3 (see Appendix 3) and will be equipped with automatic starting and transferring devices. These generators will take over the supply of electric power in case of interruption of electric current from Seoul.

The adviser has designed the footings, tanks, pipes and auxiliaries for the generators and supervised the construction. The actual installation and connection to the campus power system will be done by the College. Completion is scheduled for January 1, 1960.

(3) Water Supply System.

The present water supply system serves Buildings No. 1,2,3 and 4, and also some parts of Area No.5. It will not be able to satisfy the needs of the many new laboratories, which will be ready for use in the near future. Heavy consumers of water will include the towing tank (#5-12), the unit operations laboratory (#5-13) the hydraulic laboratory (#5-6), as well as the sanitary facilities which must soon be installed in this area. Furthermore, the completion of the new dormitories will add to this demand.

The water supply system can not meet these requirements because the pumps and water mains are undersize. Consequently, on August 18, 1959 the College submitted, through the adviser, a list of equipment and materials for a new water supply system. Main features of the new design are two 40-horsepower electrically operated pumps, 8" discharge line from pump to surge tank (lift is 180 ft.) and 10" gravity return line from the tank to the area occupied by the buildings. The new pumps will be in parallel so as to provide standby capacity should one pump

fail. The present system uses two pumps in series.

5. The Graduate School.

Strong efforts have been made to build up a demand for graduate work at the Engineering College. The desire of the armed forces of Korea for further training in advanced engineering for their officers after their graduations from the service academies can provide a limited number of well-qualified graduate students, that will justify classes and instruction, that would not otherwise be possible.

The three service academies are: Korean Military Academy which serves the army, the Korean Air Force Academy and the Korean Naval Academy.

The adviser has conferred with American and Korean officers as well as with officials and faculty members of the College relative to admittance of and graduate programs for Korean officers. The following is a list of participants in the conferences.

1. Col. W. B. Means, USA; Senior Adviser,  
Korean Military Academy
2. Lt. Col. R. T. Ramsaur, USAF, Senior Adviser,  
ROK Air Force Academy
3. Brig. Gen. Shin Yoo Hyup, ROKAF, Superintendent,  
ROK Air Force Academy
4. Lt. Col. La, Joon Kook, ROKAF, Dean  
ROK Air Force Academy
5. Lt. Col. Chung, Young Whan, ROKAF, Chief Executive,  
ROK Air Force Academy
6. Lt. Col. Song Chun Yong ROKAF, Commanding Officer,  
ROK Air Force Academy
7. Maj. Choo, Beang Ham, ROKAF,  
ROK Air Force Academy
8. Maj. Hong, Soon Ock, ROKAF,  
ROK Air Force Academy
9. First Lt. Lee, Dong Lyul, ROKAF,  
ROK Air Force Academy

Participating from the College of Engineering were, in addition to the adviser, the following.

1. Chung, Bong Hyup, Academic Dean and Professor of Mathematics
2. Park, Sang Cho, Head Civil Engineering Department
3. Kim, Hi Chul, Head Mechanical Engineering Department
4. Kim, Cheung. Hun, Naval Architecture and Marine Engineering Department
5. Wie, Sang Kyoo, Aeronautical Engineering Department

The Engineering College has agreed to accept not less than twelve officers as graduate students provided they can pass successfully the entrance examination to the Graduate School of Seoul National University (usually held in the latter part of March). The Dean of the SNU Graduate School has agreed in principle to this arrangement.

It is contemplated to let six of the officers take graduate work in civil engineering, and have the other six in the mechanical engineering department. Complete graduate curriculums for these two departments have been discussed and agreed upon. The programs are listed on the following pages.

The officers will attend the graduate school of the Engineering College for two years. If at the end of this time they have successfully fulfilled all requirements, including a thesis, they will be awarded Master of Science degrees.



SPECIAL CURRICULUMS FOR KOREAN ARMY  
AND AIR FORCE OFFICERS (GRADUATES  
OF KMA and ROKAF ACADEMY)

Department of Civil Engineering  
College of Engineering  
Seoul National University

<u>Term I</u>	hrs/wk.	credits	
Stresses in Structures I	4	3	Special
Hydraulics I	4	3	Undergrad.
Steel Structures	3	3	"
Timber Structures	3	3	"
Reinf. Conc. Struc. I	4	3	"
Surveying I	5	4	Special
Plain Concrete	2	2	Undergrad.
Concrete Testing	4	1	Special
	<hr/> 29	<hr/> 22	
<u>Term II</u>			
Stresses in Structures II	4	4	Special
Hydraulics II	4	3	Undergrad.
Bridge Construction	4	3	"
Reinf. Conc. Struc. II	5	4	"
Surveying II	5	4	Special
Materials	2	2	Undergrad.
Testing of Steel	2	1	Special
Bridge Design	3	1	"
	<hr/> 29	<hr/> 22	

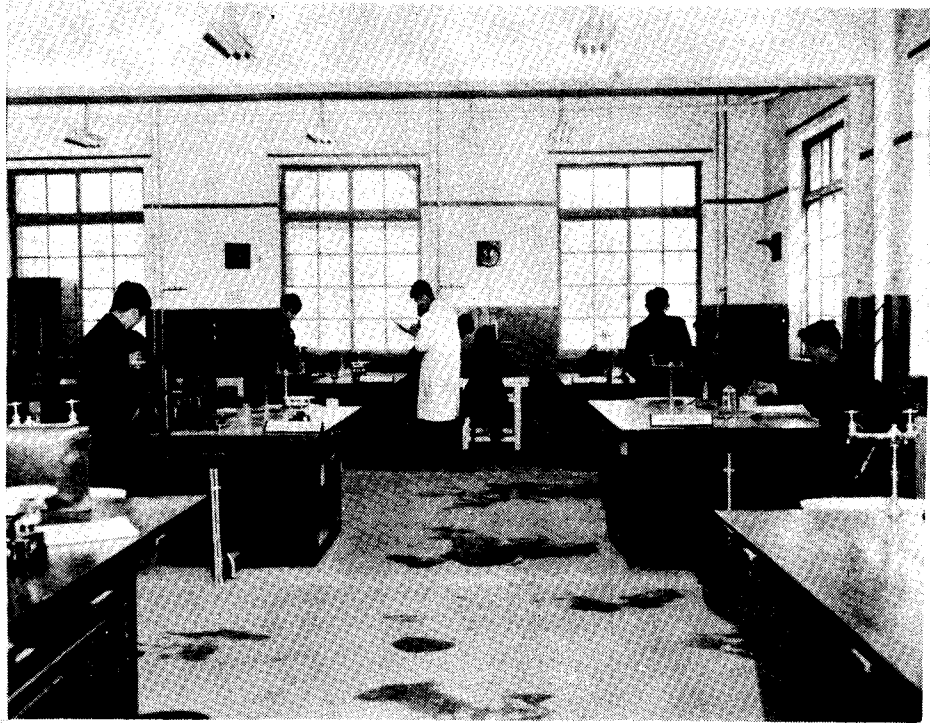
Continuation of Special Curriculums

<u>Term III</u>	hrs/wk.	credits	
Statically Indet. Struc.	4	4	Special
Soil Mechanics	4	4	Undergrad.
" " Lab	4	1	Special
Foundation & Harbor Constr.	4	4	Undergrad.
Highway Constr. I	3	3	"
Prestressed Concrete	4	4	"
Design of Struc. I	4	1	Special
	<hr/>	<hr/>	
	27	21	
 <u>Term IV</u>			
Building Construction	3	3	Special
Soil Mechanics	4	4	Undergrad.
" " Lab	4	1	Special
Highway Const. II	3	3	Undergrad.
Design of Structures II	4	2	Special
Bridge & Structures	3	3	Undergrad.
Structural Laboratory	4	1	Special
Hydraulic Structures	4	4	"
Thesis	-	-	
	<hr/>	<hr/>	
	28	22	

Department of Mechanical Engineering  
College of Engineering  
Seoul National University

<u>Term I &amp; Term II</u>	hrs/wk.	credits	
Kinematics, Machine Design	5	4	Undergrad.
Manufacturing Processes & Machine Tools	4	3	"
Int. Comb. Eng. & Adv. Subjects	4	3	"
Steam Power	3	3	"
Hydraulic Machinery	3	3	"
Air Conditioning & Refrigeration	4	3	"
Machine Drawing	4	1	"
Heat Transfer	2	2	"
	29	22	
<u>Term III &amp; Term IV</u>			
Mathematics for Mech. Eng.	2	2	Grad.
Adv. Applied Mechanics	2	2	"
Stress Analysis	2	2	"
Adv. Heat Eng. I (Power)	2	2	"
" " " II (Air Cond. and Refrigeration)	2	2	"
Adv. Fluid Mechanics	2	2	Undergrad.
Dynamics of Machinery	2	2	"
Automatic Control	2	2	Grad.
Thesis	-	-	
	16*	16*	

\* A total of 14 credits is required. All students must take Math. for Mech. Eng'rs.



Physics Laboratory Class



Materials Testing Laboratory Class

### III. RECOMMENDATIONS

#### 1. Unsolved Problems

In agreeing to direct the rehabilitation of the Engineering College of Seoul National University, the University of Minnesota also accepted implied responsibility for the future efficiency of the College. Thoughts and efforts have been devoted not only to the selection of instruments, machinery and apparatus, but also to ways and means of creating an institution, which would effectively serve the Republic of Korea in educating its youth and in providing leadership for its engineering professions.

What of the College today? In a previous portion of this report a partial answer has been given to this question. The Engineering College is in business; but it is still beset with some of the problems which have plagued it from its beginning. These problems may be summed up under two headings: absenteeism and government regulations.

Major obstacles to the full development of the Engineering College have been lack of easy accessibility and need of community environment. It is impossible to find suitable living quarters adjacent to the campus and thus avoid the waste of time and money expended on daily commuting between Seoul and the College. The situation is further aggravated by the necessity of the faculty to supplement their earnings with compensation from other teaching appointments or job opportunities.

Another barrier to the growth of the College is the prohibition of student employment not only in manual work but also in laboratories, shops and drawing rooms. Graduate students are not allowed any paid assistantships or fellowships; and likewise the assistants, instructors

and lecturers can not pursue graduate studies. These government regulations constitute a real obstacle to development of advanced studies and basic research work.

## 2. Equipment

The existing situation has been described for the various departments in a previous section of this report. The equipment, available at the College can not be considered well-balanced. While a wind tunnel and a towing tank have been procured, there is not yet any hydraulic laboratory which is basic and fundamental to an understanding of aerodynamics, hydrodynamics, sanitary engineering and a host of problems in mechanical engineering. It has been estimated that at least \$35,000.00 will be required for procurements of items needed in a hydraulic laboratory. This proposed allocation should receive a high priority.

A very considerable counterpart amount will be required for completion of the hydraulic laboratory in Building #5-6. The estimated sum is HW.50,000,000.00.

The wind tunnel for the Aeronautical Department will also necessitate substantial purchases of local materials (mostly plywood) and labor (HW.10,000,000.00). Before the tunnel can be erected, it will be necessary to expand Building #5-11, in order to provide sufficient floor area for installation and operation. The estimated cost of this addition is HW.5,000,000.00.

The completion of the towing tank requires both dollars and hwans and must also be considered urgent in view of the sizable investment that has already been made in the laboratory for naval architecture.

The textile department is another example of heavy commitments,

which will necessitate expenditure of counterpart funds. Pipes for steam and compressed air as well as floor drains and electric conduits in Building #4 will require an outlay of roughly HW.15,000,000.00.

Finally it will be necessary to provide equipment and floor space for the newly created nuclear engineering department. An arrangement should be worked out with the newly created Atomic Energy Commission for joint use of apparatus and instruments. The laboratories and research facilities of the Commission will be located in buildings now under construction adjacent and within walking distance to the Engineering College. Also of importance in this connection is the transfer of three professors from the College to key posts on the Commission. Professors Kim, Dong Il (Head, Chem. Eng.) Lee, Jong Il (Head, Elec. Eng.) and Park, Dong Gil (Mining) have accepted the three leading technical positions on the Atomic Energy Commission, thus providing an effective link between the College and the Commission. Nevertheless, it will be necessary to expend considerable sums of money on equipment for nuclear engineering.

It has been shown elsewhere in this report that the funds earmarked for FY. 1958 and FY. 1959 have been very nearly exhausted and that the allocation for FY. 1960 is much too small to take care of any major commitments. It will be necessary to ask for supplementary funds in 1960.

To sum up it is recommended that available funds be used for procurement of equipment necessary for completion of textile, naval and aeronautical laboratories. Next, the establishment of the hydraulic laboratory should be financed. Finally, a nuclear engineering laboratory

should be planned and funds allocated, and a careful survey made of the needs for additional equipment in other departments.

### 3. Participants

Approximate eighty per cent of the regular appointed staff members have had periods of study and observation in United States. The effects of this training have been of significance not only to the Engineering College but also to other engineering schools such as Hanyang Institute of Technology in Seoul and Inha University at Incheon, where many of the faculty members teach part time. At the present time 50 have returned to Korea. Of this number 14 have received M.S. degrees and 3 have received both M.S. and Ph.D. degrees.

Any recommendations relative to additional training for participants must take into account that the contract, as far as engineering is concerned will be terminated in less than two years. Also to be considered is the fact that the College has few vacant places on its table of organization (T-O) which can be reserved for new returning participants.

It is proposed that the College consider sending some of the participants, who received M.S. degrees but not Ph.D. degrees to United States for a second period of study in order to give them opportunities to acquire doctorates. An examination of the scholastic records of these participants will disclose that more than one-half of this number are fully capable of successfully completing the requirements for the highest earned degree.

The value to the individual and to the College of a doctor's



degree should not be underestimated. Knowledge, discipline, ability to plan, evaluate and interpret research, and power of independent thinking are some of the rewards of which the College of Engineering would be the main beneficiary.

#### 4. Sponsored Research

As listed in a previous section of this report there is at present a moderate amount of research work in progress in the various departments of the College. Some departments are more productive than others. Mining and Chemical Engineering are especially active.

Serious consideration should be given to establishing a policy of seeking suitable research projects, sponsored by outside organizations such as Government agencies and (preferably) private firms for execution in the laboratories of the Engineering College. And very careful thought should be given to incentives to active research by the staff.

At the present time it is not possible for the faculty members to receive any additional compensation for research work on government sponsored projects. In the case of privately financed projects it is possible, because the sponsor will deal directly with the individual staff member; who will not only perform the technical work but will also receive and disburse the funds, as he sees fit, just as if he was a consulting engineer in private practice. There is nothing basically wrong or unethical about this procedure, but it is conceivable that it could be abused if it is carried to the extent that the College provides

offices and equipment for the private gains of individual staff members.

It is recommended that the College set up a committee to promote and procure research projects from both private and government sources. This committee should also formulate rules and regulations for the financial transactions which are involved in research projects for private companies. It is recommended that a very small percentage of the total cost of the project be retained by the College for depreciation of equipment involved in tests and experiments.

In the case of government sponsored research work it is recommended that:

1. Seoul National University should persuade the Ministry of Education to change its present rules which prohibit College faculty members to receive additional compensation from government financed projects.
2. Failing this, the College should make it possible for staff members to be relieved of teaching loads in order to engage in research.

##### 5. The Graduate School

At present graduate work at the Engineering College can only be considered little more than a token. It is highly desirable that definite efforts be made to increase the scope of graduate instruction as well as the number of graduate students.

The faculty members, who teach graduate students receive

additional compensation, and as this has been accepted in principle by the Ministry of Education, there should be no reason why these extra remunerations should not be increased if larger enrolments permit. This should prove a strong incentive.

In order to increase the number of graduate students it is imperative that the regulation prohibiting their part-time employment on the campus be changed. Another obstacle is the regulation preventing the lower ranks of the staff to take graduate work leading to advanced degrees. Not only would this increase the graduate enrolment but the College would benefit by having a better educated and enlightened faculty.

But the greatest of all opportunities is the intention of the service academies of the Korean Army, Navy and Air Force to send commissioned officers to study for two years as full time graduate students. The service academies propose to select, on the basis of high scholastic achievements, twelve officers for the first year to major in civil and mechanical engineering. The officers will of course be required to pass the entrance examination to the graduate school.

It is hoped that both the Engineering College and the Administration of Seoul National University will realize the importance of this opportunity to build up graduate work in engineering and subsequently in other fields. The public relations values that will result from this service to the Korean armed services can hardly be overestimated.

## 6. Teaching of English

English is a required subject in the freshman year. Several departments have English as an elective course in the sophomore year, and one department (civil) has it in both sophomore and Junior year.

English is assuming increasing importance in Korea, in Seoul National University and at the Engineering College. Many courses require American textbooks and even those based on Korean and Japanese texts, are built around an English terminology. It is not unusual in a lecture given in Korean to see the entire blackboard covered with English words and expressions; and very often these are also given their correct pronunciation and meaning by the lecturer.

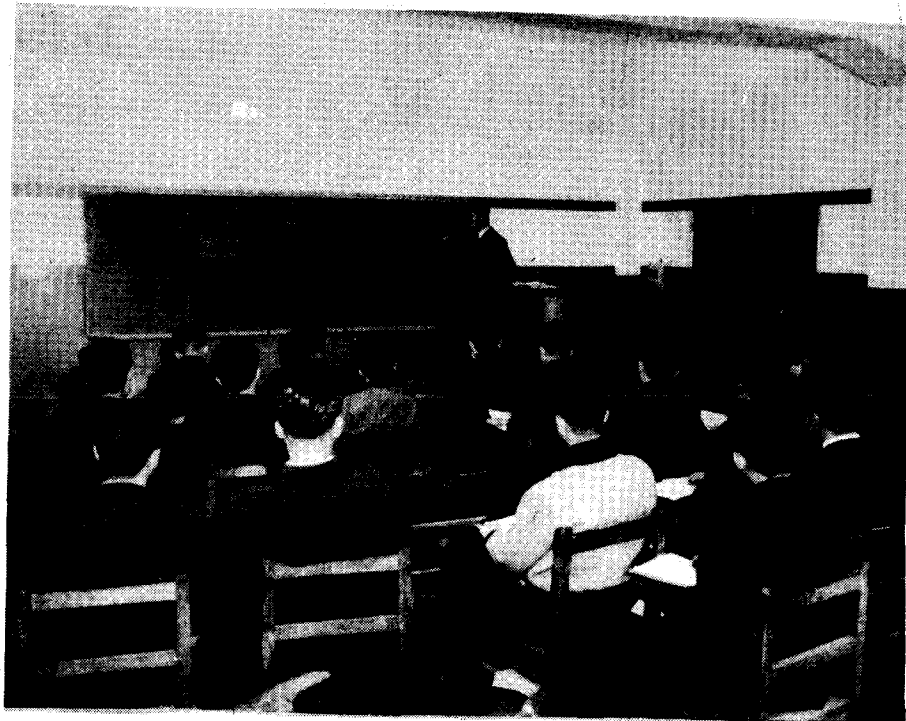
The library is another example of English as an important and indispensable tool for the Korean engineer. Practically all new books and periodicals are published in the United States. It is of interest to note that the curriculum of the Korean Military Academy includes four full years of English.

During a recent visit to the Engineering College of engineers from Cambodia, English was the only means of communications between the Koreans and the Cambodians.

There is general accord among all instructors of both English and professional subjects, that the requirements in English should be doubled. Instead of one year it should be extended to two years.



Auditorium will seat only 186



Use of English terminology in Lecture

7. Future Planning

The immediate needs of the Engineering College have already been discussed, and in the following will be taken up some aspects of the situation which will require attention; some before the present contract with the University of Minnesota expires, and some in the years to follow.

(1) Auditorium.

The present auditorium is located on the third floor of Building No.1. It will only seat 186 persons. This is about the enrollment in one department. Larger gatherings can not be accommodated. It is impossible to invite prominent engineers, educators and government officials to come to the campus and address students and faculty. There is an urgent need for an auditorium for large assemblies. It is recommended to construct a separate building with an auditorium large enough to seat 3000 persons. A hall of this size could be used for technical conferences and other functions and also serve the large student and staff assemblies.

(2) Library.

It is expected that the present plan for increasing the capacity of the stack room will tide the library over the difficult period of the next year or so. A micro-film projector will be a necessity in the near future. Both faculty and graduate students would benefit by being able to review articles and papers published before the inception of the Minnesota contract. This will certainly be a more economical solution than trying to obtain back numbers of periodicals for the last twenty years or so.

A new library building must eventually be constructed and should receive high priority on any future building program. The present reading room is already too small especially in cold and inclement weather, when the students can not study outside. A new library building with storage facilities for at least 200,000 books and reading room capacity of 400 is recommended for consideration.

(3) Faculty Housing.

The need for a residential community adjacent to the Engineering College has been stressed by most advisers. The waste of time that is a result of the commuting between Seoul and the campus has been and still is the major obstacle to the development of the College.

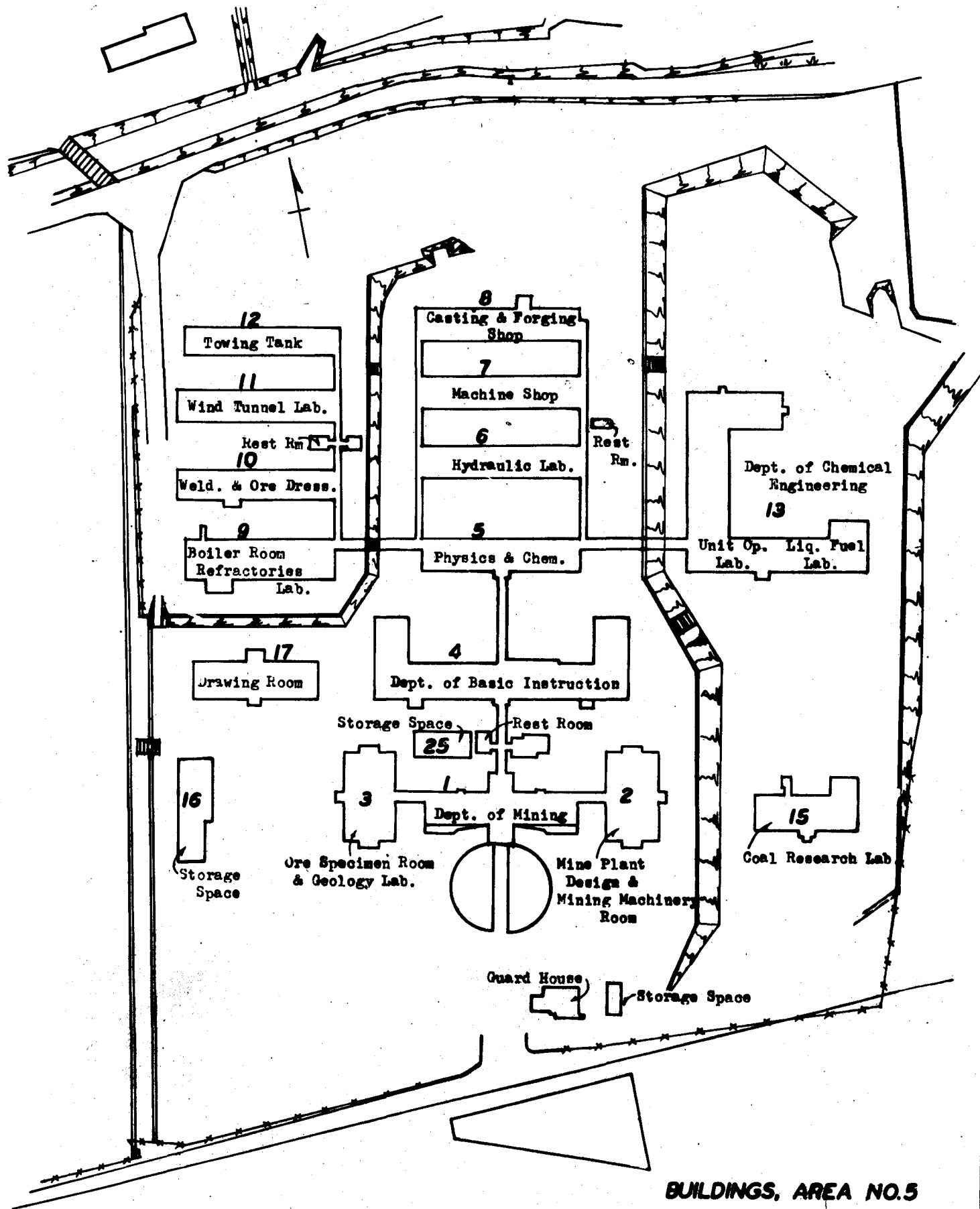
As far as students are concerned, the completion of the dormitories will be a big step forward. Bachelor quarters for 16 faculty members will also be available in the new dormitories, but there still remains the problem of giving faculty members with dependents an opportunity to locate within walking distance of the College.

It is recommended that serious consideration be given to a faculty housing project. A group of say 40 houses could be built on the land north of the new dormitory complex and west of Building No.4. The houses could be rented or mortgaged to faculty members with dependents. The project should, of course, be self-supporting. It should be given earnest attention.

A P P E N D I X 1

Showing Buildings in Area No.5 and  
Occupancies by Departments.





A P P E N D I X 2

Showing Additions and Alterations to Building No.5-11.  
Present Floor Area is Insufficient for Installation  
and Operation of Wind Tunnel for Aeronautical  
Engineering Department