

REPORT OF ADVISER IN ENGINEERING -- APRIL, 1956

By William R. Weems

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REPORT TO THE PRESIDENT, SEOUL NATIONAL UNIVERSITY

BY ADVISER IN ENGINEERING, APRIL, 1956

William R. Weems

I. INTRODUCTION

This report deals with the status of the Engineering portion of the cooperative arrangement between Seoul National University and the University of Minnesota, plus the observations of the Adviser in Engineering from 1 March, 1955 to April, 1956. The report is intended to be helpful in informing both the Administration of Seoul National University and the interested offices of the University of Minnesota, including future advisers in the engineering field at Seoul National University. Appended is also a set of memorandums that have been distributed to the faculty plus one to the student body.

In view of the ramified nature of this report, no brief summary seems feasible. However, some general remarks may be in order.

II. GENERAL REMARKS

One overall impression may be noted as running through the report. It is that the Engineering College is conducting essentially a valiant "holding operation" and that the task of upgrading it is bigger and will take more time than seems to be generally realized. Closely allied with this is the underlying observation that the greatest difficulties are not technical or physical at all, but sociological and cultural - in the realm of attitudes and spirit. They appear in the form of lack of sense of responsibility, passivity, lack of moral basis for behavior, low standards, lack of teamwork, and so forth. These intangibles would seem to be the main factors limiting improvements, and since attitude patterns change but slowly, the inevitable conclusion is that it will take a long time to achieve a really healthy and first-rank situation at the Engineering College.

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The writer, although called "adviser" has really functioned not as an adviser but as a liaison man, an interpreter and explainer. The job to be done has not been one of advising or improving something so much as one of establishing the conditions prerequisite to such improvements. That is, there must be established a faculty group who will assume at least professional responsibility for planning and promoting the policies of a good engineering college. They need to have self-confidence, perspective and interest in the job on a long-term basis, plus a cooperative group spirit. By providing equipment for the core activity of the college (i.e., undergraduate instruction) and by arranging for a large number of the teaching staff to have short-term training and experience in the United States, we hope to encourage the formation of the above-mentioned qualities.

Some of the factors controlling the faculty atmosphere cannot be provided by the advisory group. In particular, there is the matter of providing a salary scale which will make it reasonable to insist that faculty members have their primary allegiance to the college. Some welcome progress has just been made on this by the University. Another item about which the aid program can do something but cannot provide the "will to do" is the problem of campus life and unity - the provision of dormitories, faculty housing, long-range campus planning, etc.

The most important thing the University of Minnesota can do in this relationship would seem to be to provide the faculty with the inspiration, perspective and self-assurance they need to build up a first-class engineering school. This can be done through seeing and hearing and experiencing under operating conditions in the United States far better than by having someone talk about it in Seoul.

III. ACTIVITY TO DATE

The activity under the Engineering portion of the cooperative arrangement has had three major centers of interest - equipment, upgrading of faculty, and advisers. These are discussed below in turn.

Equipment. Through cooperation between the faculty planning committee for laboratory rehabilitation and the Minnesota advisers (primarily Professor C. E. Lund), excellent lists of equipment have been prepared to cover procurement through the current fiscal year. Preliminary work has been done for supplemental lists for fiscal 1957. Professor Yun, Yung Ha is leading the faculty committee in this work and is now in the United States to help Professor Lund with the procurement and to familiarize himself with United States practices as background for being responsible for arranging and managing the laboratories at the Engineering College. A great many Minnesota professors have contributed their time to the tedious job of preparing the lists. Although there have been many frustrating delays in arranging for the procurement of the equipment, we confidently expect it to be arriving by fall, 1956. The total dollar value of equipment approved for purchase to date is estimated at \$730,000. Top priority has been given to equipment for undergraduate teaching, contrary to the former custom. This policy is in line with the idea of modernizing the teaching techniques so as to emphasize "learning by doing" - education whose purpose is the development of ability to solve real problems.

Upgrading the Faculty. Those of us who are close to the situation at the Engineering College have been impressed with the prime importance of this aspect of the cooperative project. For various reasons the faculty as a whole impress one as inadequately equipped in experience and in attitudes to take hold and improve the College with or without the help of United States advisers. Some of the possible reasons for this are mentioned

above under General Remarks and below under The Major Problems. Whatever the explanation, the faculty obviously needs experience in modern technological education and the broadening and professional maturity that we believe they can get from a suitable experience in the United States. This belief, plus the conviction that the faculty is the heart of any college, causes us to place the faculty training part of the project in the position of first importance. A phased plan for the United States training of a large proportion of the faculty has been carefully worked out so as to keep a group of key people on the job at Seoul National University at all times. It also involves a sliding scale of training--with few exceptions, the young men (under 30 years of age) are to get 2 years of regular study in the United States, the middle group (30-40 years) are to get 1 year of study, and the senior group (over 40 years) are to get a half year of observation and study under a specially designed program. The philosophy behind this plan and the details have been discussed in correspondence of which you have copies. The actual man-year allocation of Seoul National University people, corrected to date, under this plan is $54\frac{1}{2}$. The number of people is 49.

Advisers. Under this, the third major focal point of activity, activity has not been up to what may have been anticipated originally, but has been reasonably good under the conditions that actually evolved. All parties concerned had to do a lot of guessing when initial plans were set up; on the basis of those guesses the number of advisers and the lengths of their tours may seem disappointing, but on the basis of what an adviser can actually do at the College at this time, I believe there is no cause for disappointment. The truth is that there is little an adviser can do besides acquaint himself with the local background until such time as the faculty return from their United States training and there is some equipment

on hand to work with. At present there are only two departments for which we do not have someone specific in mind, and these cases are being worked on actively. As you know, our policy has been for advisers to stick to an advisory role of dealing with the faculty rather than one of trying to augment the teaching staff temporarily. Due to existing differences of educational approach and to the severe language barrier, we do not believe that an American professor's time would be effectively spent in teaching at the Engineering College, except perhaps as demonstration teaching of subjects additional to the regular curriculum. Once real laboratory courses are set up, and most of the faculty have accommodated their attitudes to the western style of teaching, there will be much more of a possibility of effective work along this line. The first three advisers selected after my arrival here were selected basically by the University of Minnesota and approved by you. The same is true for Professor Andersen of Civil Engineering. For all the others we have followed a policy of having the Korean faculty take initiative in the suggesting or selecting of the adviser. In the case of Professor Andersen, the head of your Civil Engineering Department, (Professor Park, Sang Cho) will have an opportunity to get well acquainted with him before his departure for Korea.

Building Rehabilitation. Aid to cover materials for the rehabilitation of the destroyed and damaged buildings has been provided under appropriations separate from the Minnesota project, and our function in that connection has been minor, consisting primarily of expediting and doing liaison work where needed.

IV. FUTURE AID TO ENGINEERING COLLEGE

The most important thing to bear in mind in regard to any future aid such as extension of the present Minnesota project is that the initiative must come from the Korean side - including the Republic of Korea Government.

This view appears to be strongly held by all concerned at Minnesota. It is the writer's personal opinion that such a policy was not actually followed in connection with setting up the project in the first place - that is, the initiative did not in fact come from the Korean side and the project was not aired and discussed nearly enough throughout the ROK Government. The result has been much frustration and uphill climbing due to lack of understanding and acceptance within various Governmental offices. I feel sure that Dean Spilhaus discussed this point with you when he was here recently.

As to extension, I believe that a modest extension is entirely in order, and both Dean Spilhaus and Dr. Schneider agree with me in this - of course, with the above-mentioned proviso in regard to the initiative. I believe this extension could be carried out with funds that have been saved out of the originally estimated amounts for the 3-year project. The primary purpose of the extension would be to enable rounding out the phased program of United States training of the faculty, as well as the program of equipping laboratories. The latter has been handicapped by the necessity of taking action before the affected faculty has had a chance to gain the experience they need as a basis for selecting equipment. The final parts of the lists of equipment will therefore need to be procured during the proposed extension period. I should like to go on record to the effect that the College, through Dean Hwang, has been most realistic and cooperative in the matter of cutting the lists of equipment requested down to modest levels and emphasizing equipment for undergraduate teaching. During this period of expansion with the college faculty having reached a state of training to make better use of advisers from the United States, and with some equipment on hand to work with, the recruiting of advisers may also be easier.

Suggestions for your consideration for the extension period include:

- (a) Sending 2 or 3 technicians to the United States for on-the-job training in maintenance and operation of college laboratories.
- (b) Sending 1 or 2 people (if properly qualified ones can be found) to study and observe in Humanities in Technological Education.
- (c) Embarking on a program of dormitory construction as part of a plan for community development at the Engineering College.
- (d) Asking the University of Minnesota to serve as an administrative agent to handle the United States training of faculty, but not necessarily to try to accommodate them at the University. Even in fields where Minnesota has excellent offerings, it may be better for Seoul National University to have the faculty members receive training in a number of institutions.

V. THE MAJOR PROBLEMS

You will recall that, in connection with preparing a status report for the information of the University of Minnesota last summer, I discussed with you what I called the four major problems of Seoul National University.

One of the major problems mentioned is that of the faculty pay situation. It is most gratifying to note that, effective this month, the salary contributions from the Financial Support Organization are being doubled. The University Administration is to be congratulated for taking this realistic step. Now it should be possible to keep most of the faculty on the job a majority of the time, with only a couple of days per week on side jobs. Another gratifying related step is the obtaining of 10 additional tenure positions (T.O.) vacancies effective July 1, 1956, which will be held to accommodate returning program participants who do not currently hold tenure positions. Both of these steps are sure to be helpful in creating a favorable working situation for the valuable men in whom overseas training is being invested.

A second major problem is that of accessibility and community environment. Something has been done about this through buying and operating busses and through seeking the cooperation of the Railway Bureau in scheduling service.

The third major problem cited in the earlier report is that of cultural conditioning of the faculty. This now looms as the number one problem and the hardest to solve. Under this heading I include most of the things that appear to an American adviser in Korea as obstacles not only to his own work but to the successful accommodation of Korea to Western technology. While urging the University administration to do everything it can to attack this problem, I am at a loss to know what specifically to suggest that the University do along this line. The United States experiences that a majority of the faculty will receive under this program should do much to help this problem.

The fourth major problem is that of continuity of administration. The necessity for frequent elections and turnover in leadership, which is a survival of the Japanese system of education, is deadly indeed on any tendency to plan--something which seems to be sorely needed. During the fluid and transitional period of these days such a rotating system may be desirable, but eventually it would seem almost necessary to have indefinite terms of appointment. In this matter of continuity, the private colleges seem to have a definite advantage over the Government ones. As to the present situation of the Engineering College, Dean Hwang expects to stay on until such time as the laboratories are fully equipped and adequately manned and operating. This is welcome knowledge, but the weakness of the system remains. I earnestly hope that somewhere out of the 49 people being sent to the United States there will emerge a natural and healthy leadership for the future - not only the Deanship, but all along the line.

In spite of the encouraging action that has been noted on some of the major problems discussed above, much more remains to be done. On the matter of tenure openings on the faculty for the returning trainees, it is estimated that approximately 12 additional vacancies will be needed next year (July, 1957) to take care of non-T.O. people now scheduled for training under the Minnesota project. Even more urgent is continuing effort to raise the pay scales so as to permit virtually full-time concentration of the faculty. In the case of the engineers, as opposed to faculty of other colleges, there is also the matter of coming somewhere near to competing with the salaries they can make on the outside. That is, the matter of attracting and holding a high-caliber faculty in engineering is quite different from that in other colleges, such as Liberal Arts, for example. It does not seem realistic to adhere to the same pay scales for the two, although I realize that there are political obstacles to a differentiated pay scale. I suggest that serious consideration be given to providing "incentive pay" in some way. For example, a new set of titles (laboratory director, research supervisor, etc.) or change in the rules of the financial support organization (PTA) might justify more pay for these better trained engineers. Another suggestion is discussed under "Sponsored Research" below.

On the matter of community environment, the work that seems indicated for the future is, in suggested order of priority:

- (1) Prepare adequate room with secure windows and doors to house the laboratory equipment being procured.
- (2) Rehabilitate and restore the former Mining College (Building No. 5) according to plan.
- (3) Obtain possession of the 4 barracks-type buildings on the campus, to which the ROK Army claims title.
- (4) Produce a well-thought-out plan of campus development to guide future actions as money becomes available (Action along this line was started by Professor Graffunder but seems to have died where he left it).

- (5) Embark on a program of dormitory construction.
- (6) Construct an auditorium for large student assemblies.
- (7) Construct a "student union" type building and recreational facilities.

VI. STUDENTS

The nature of the job as Engineering Adviser has not put me in very frequent and direct contact with the students. On the other hand, my occasional and casual contacts have been among the most encouraging of my experiences. The students give the impression of emotional maturity and balance that bodes well for the future of Korea. The extent to which they take hold and operate their own affairs with little faculty supervision is a good sign for the democratic development of the country.

VII. UNIQUE ASPECTS OF THE SITUATION

I feel that I should call to your attention certain aspects of the situation of the Engineering College which I believe to be unique to technical education in Korea or unique to that College within the Seoul National University. It would seem to be necessary to face up to these special factors. They are partly self-explanatory, so are touched on only briefly, as follows:

- (1) The importance of emphasizing the ability to think creatively, as opposed to scholarly erudition. This emphasis involves heavy use of laboratory methods and problem-solving teaching techniques.
- (2) The fact that a large portion of the faculty will have had overseas training by the fall of 1957 (mostly recent and in the United States). This means that the conditions will exist for a great deal of innovation and forward progress provided it is not frustrated by either reactionary opposition or simple lack of support.
- (3) The physical separation of the College of Engineering from all other Colleges of the University. Some of the environmental problems caused by this fact are discussed elsewhere; it may also have an important bearing on the University's policy in regard to such things as autonomy versus integration of curricula.

- (4) The special relation that this, the nation's top college of engineering, bears to the economic build-up of Korea. It would seem that this school has a special obligation to leave no stones unturned in its efforts to provide the nation with a core of technologically competent men.
- (5) The uniquely retarded situation of technological education in Korea in comparison with other professional fields. This situation is mentioned in my earlier status report and also in a Special Memorandum.
- (6) The potential for leadership of the College in establishing more healthy attitude patterns in Korea regarding useful activity in general.

VIII. ORGANIZATIONAL STATUS

In view of the several unique features of the Engineering College situation, I feel that it is highly desirable for the technological educational activities of the University, now represented by the Engineering College, to have a high degree of autonomy and freedom from any tendency to arbitrarily lock the curriculum in step with those of other colleges. I believe the unique situation and mission of the Engineering College makes it imperative that its success not be jeopardized in any way that can be avoided. Of course this conclusion is predicted on the assumption that adequate and long-term leadership for the College can be found. That is a major problem in itself, discussed above.

The University Administration can be most useful in this matter by protecting the Engineering College from undue shackling by bureaucratic controls of all kinds, whether from inside or outside the University. This is particularly true because of the fact that very few of today's leaders in Korea seem to have had the kind of experience that would give them a deep understanding of the problems of technological education.

IX. PROTECTING OUR INVESTMENT

Both the Korean Government, through the University, and the United States Government have so-to-speak "invested" large sums of money and

large hopes in the Engineering College. Naturally it would be most unwise not to take adequate precautions against loss of this investment. At least the following should be done:

- (1) Assure adequate maintenance. This subject is so important, and the Americans are so sensitive on it, that it is the subject of one of my special memorandums to the faculty. Since the laboratory equipment will be the most apparent result of the aid program, and since numbers of United States officials and others will undoubtedly inspect the results, it should be clear that special emphasis on maintenance is in order, regardless of anyone's views locally. I hope that in any extension of the current arrangement 2 or 3 key laboratory technicians can be sent to the United States for a very practical type of training. These people, like the faculty who receive special training, will need to be adequately paid and treated in order to retain them after their special training.
- (2) Security against theft and "borrowing." As Dean Spilhaus pointed out, a secure fence and adequate guards would seem of great importance. I think that it is just as important, if not more so, to set up proper systems to assure that equipment will not be "borrowed" and taken elsewhere by the students or faculty members. Some kind of heavy deposit system may work for the students. I am not sure such a system would be feasible with the faculty, but some sort of system of controls will definitely be needed. With the weak control over the faculty that obtains in other matters, I am pessimistic indeed as to how well the equipment can be kept together and used for the benefit of the College as a whole. This gets back to what I consider the really biggest problem of the College, which I discussed earlier--namely the cultural conditioning of the faculty.
- (3) Protection against natural deterioration. The equipment being provided under the aid program is built for use in the United States, where it is customary to keep some heat in the buildings all winter and where, generally, the high humidity conditions of the Korean rainy season do not occur. Professor Lund has pointed out to the Administration of the College the importance of grouping equipment so that extreme cold and humidity can be avoided by a moderate use of heat in small parts of the buildings even during the winter holiday. Dust is also an important factor. The concrete floors will produce a great deal of abrasive dust unless given suitable chemical treatment. This material can be purchased in the United States, but is apparently not commonly used in the Orient. Proper supervision of laboratories, including the enforcement of reasonable rules for neatness, cleaning up after oneself, checking equipment in and out, and (most of all) maintenance by competent men, should do much to assure against undue deterioration of the equipment and buildings.

- (4) Purchasing Agent. It would be highly desirable for the College to be developing a purchasing agent with both technical and business background as well as command of the English language and United States business correspondence, to do the job of procuring replacement parts, expendable supplies, and additions to the laboratory equipment. This function is a difficult one to man and involves a great deal more detail and knowledge than may appear on the surface. The University of Minnesota is providing this indispensable service at the present time, and there appears to be no one at the College equipped to do it at the present time.

X. SPONSORED RESEARCH

Although it is true that in selecting laboratory equipment first priority is being given to the equipment necessary for good undergraduate teaching, it is also true that much of this equipment is suitable for use in doing research. Furthermore, as the faculty's level of competence reaches the point of being able to specify what they need and make good use of it, it is planned to provide modest amounts of research equipment in fields of importance to the Korean economy. I should like to suggest that serious consideration be given to a policy of seeking suitable research projects sponsored by outside groups--Government bureaus, private firms, etc.-- for execution in the laboratories of the Engineering College. The arguments for it include these:

- (1) It would stimulate the faculty professionally and help to make the Engineering College a more desirable place to work.
- (2) It would help increase the income of the College faculty through professionally suitable work which could be done on the campus, rather than outside somewhere. It would therefore help in the problem of availability and regularity of attendance of the faculty, as well as in the annual budget battle.
- (3) It would benefit Korean industry as a whole by making economical use of aid goods that happen to have been concentrated at the one place.
- (4) It has the sanction of being the custom in other countries. Of course, ethical safeguards are absolutely essential, and would probably have to develop with local experience. This would indicate the desirability of a modest beginning soon.

XI. ENGLISH LANGUAGE TEACHING

This is a subject about which I have expressed myself to you before, and you know how important I feel it to be. Although the teaching of English is now compulsory, I have observed that the methods and attitudes are essentially the same as they were in the pre-liberation days. That is, the emphasis is on reading--and reading of classical literature, I might add--under the theory that as a national policy Koreans can best absorb western culture through reading. In my opinion that is an out-dated viewpoint, or at best is a viewpoint that may apply to only a minority of Korean students who aim to be literary scholars. For a far larger number of future Koreans, it seems to me, and for the Engineering students in particular, English will have to be looked upon as a working language--i.e., a language used every day in business and industry for practical things. In such a world, accurate and reliable two-way communication is more important than beauty or complication of expression. The number of Koreans who need to use the English language for dealing with foreigners as much as in a host of other ways, is, I think, a bigger minority than that which is interested for classical literary purposes. It is also a rapidly grown minority.

Furthermore, language teaching methods have made a great deal of progress in the world outside Korea in recent decades. The emphasis is on learning primarily through the spoken language, even if the eventual purpose is to appreciate the written form of language. This fact does not seem to be generally appreciated in Korea as yet. Certainly I have seen no appreciation on the part of English teachers at the Engineering College of modern techniques at language teaching.

It is obvious where my preferences lie in this matter. The main point of my present remarks is to call to your attention that I think there is an oncoming battle between these two basic approaches to English teaching

and to emphasize the importance of English as a working language for engineers. Secondly, I wish to urge that you encourage the modernization of English language teaching at the Engineering College. This could be done through training existing or potential faculty (such as Professor Yu, Chin, who is now in the United States) and by taking advantage of the presence of Dr. Fred Lukoff, who is now in Seoul under sponsorship of the Asia Foundation. It could also be done through hiring others who may be already so trained, and through official encouragement from the University Administration.

XII. CURRICULUM CHANGES

In addition to the matter of English language teaching, I suggest for serious consideration the following changes in the offerings of the Engineering College:

- (1) The addition of an Industrial Management option or curriculum. Dean Hwang already has plans along this line. My only caution is to keep it good and not to just add a course in name only. There are a few Koreans having or now receiving United States training in this field. Perhaps one of them could be secured to start this off.
- (2) A further strengthening of the science courses, and better integration with the Engineering departments of the College. This effort will be aided by the present plans for United States training of one leader each in Mathematics, Physics, and Chemistry. The students of technological courses need to have basic science preparation that is second to none. In fact there is no sharp line between science and engineering - they blend together.
- (3) A preparatory study of the proper function and nature of the humanities subjects in your engineering curricula. It is, of course, important that engineers receive a well-rounded education. In the United States this matter is receiving much attention at present, and it would seem especially important in a democratic society. In my opinion the urgency of this is not yet great, but it may become so in a few years. The natural tendency toward the classics is so strong in this country that for the time being I would stress the active and practical (almost hobby-shop) type of course and de-emphasize the "classics" frame of mind.

- (4) An eventual shift of industrially-oriented laboratories to other schools. For the time being it is probably fitting that certain laboratories at the College be of an essentially "industrial practice" type (Textile Practice Laboratory, for example). However, as the College develops and offers really top grade engineering instruction, it would seem desirable to shift such industrially oriented activities to trade schools and to use the College laboratories for instruction of a less routine character.

XIII. LIBRARY

A great many books are being procured under the present aid program. Others have come and will come from UNKRA and other sources to augment the existing remnant of the pre-war library. It is a matter of much concern that few people make use of the library, and methods of book classification and of library management in general are makeshift. At least one of the senior faculty members will observe United States practices in Engineering libraries. It is hoped that he will be able to adopt some of what he sees. The matter is too big to be solved by this alone, of course; there should be a trained librarian at a professional salary level, with special skills to equip him for the complicated classification problems of a multi-lingual technical library.