

The Cornell-Los Baños Story

Kenneth L. Turk



THE  
CORNELL - LOS BAÑOS  
STORY

Two Decades of Cooperation  
in Agricultural Education and Research  
between Cornell University and the University of the Philippines



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*by*

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*To*

DEAN WILLIAM I. MYERS

who was largely responsible for the birth of the Cornell-Los Baños program and who left no stone unturned in the formulative years to develop the combined interests of the two universities and their faculty members in this mutual endeavor

*and*

DEAN CHARLES E. PALM

for his keen interest, excellent support and dynamic leadership throughout the U.P.-Cornell Graduate Education Program.

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# Preface

This account chronicles almost two decades of cooperative relationships in agricultural education and research between the University of the Philippines' College of Agriculture at Los Baños and the New York State College of Agriculture and Life Sciences at Cornell University. It is meant to be a historical document of what these two universities, working mutually together, set out to do, what they did, and what was accomplished. The Cornell-Los Baños Story is a remarkable history of an investment in education and research with its major thrust on the development of people.

Phase I reviews the role of this unique partnership in the rebirth of the University of the Philippines' College of Agriculture following its almost complete destruction during World War II. This Cornell-Los Baños project, as it became known throughout the world, was financed largely by the United States Mutual Security Agency, (later the International Cooperation Administration and now the Agency for International Development) and the National Economic Council of the Philippines.

Leadership in this significant effort in institutional development and relationships was provided by the late Dean L. B. Uichanco of the University of the Philippines and Dean W. I. Myers of Cornell. During the latter phases of the cooperative program, Dr. D. L. Umali became Dean at Los Baños and Dr. C. E. Palm succeeded to the position as Dean of the College of Agriculture at Cornell.

Over a period of eight years (1952-1960), a total of 51 American professors, including 35 from the Cornell campus, participated in the project, serving from one to three years at Los Baños.

A relationship of mutual trust and confidence between Cornell and the U.P. College of Agriculture became firmly established. When the program was terminated by mutual agreement in 1960, the physical plant of the College had been largely rebuilt, the Central Experiment Station was established and functioning, and teaching programs had been improved over their previous standards. Enrollments had reached an all-time high and procedures were established to stabilize enrollment and improve the quality of students. During the period of the Contract, 188 staff members from the Philippines had received advanced training, either at home or in other countries, primarily the

United States. Los Baños was rapidly becoming recognized as a teaching and research center extending far beyond the boundaries of the Philippines.

Concurrently with the Contract in agriculture, another assistance contract was in effect, 1957-1960, between Cornell University and the University Philippines' College of Forestry at Los Baños. This program also was sponsored by the International Cooperation Administration of the United States and the National Economic Council of the Philippines.

The primary purpose of this program for the College of Forestry was to expand and strengthen its overall educational program and related operations in accordance with the rapidly growing needs of the nation for professional foresters and trained forestry technicians. In line with this broad goal, the objectives of the Cornell Contract were aimed toward assisting the College in the expansion and improvement of its faculty and physical facilities and toward upgrading of its professional educational program. This involved substantial effort in preparation of development plans, new construction, procurement of scientific equipment and supplies, faculty recruitment and training, modernization of the curriculum, improvement of teaching methods, and stimulation of research.

Since Cornell has no forestry faculty of its own, all of the visiting professors under this contract, with one exception from Cornell, were recruited from the State University College of Forestry at Syracuse University. A new contract with State University of New York then was signed for another three-year period (1960-1963) for continuation of assistance to the U.P. College of Forestry. This second assistance contract was extended by subsequent amendments to June, 1965. During the eight-year period substantial progress was made in attaining the goals that had been established earlier.

The Interim Phase (1960-1963) of the Cornell-Los Baños Story involved several significant developments. Chief among these was the inauguration of the International Rice Research Institute in 1962 on the campus of the U.P. College of Agriculture by the Rockefeller and Ford Foundations, and the initiation by Dean Umali and his associates in the College of a five-year development program.

The Rockefeller Foundation expanded its support for graduate scholarships that provided opportunities for large numbers of carefully selected young staff members to pursue doctoral studies at universities in the United States. Grants were made for new equipment and for specific research projects and funds from the Foundation were provided for the International House, a dormitory for international and Philippine students.

Realizing the need for continued pursuit of excellence in both the academic atmosphere and physical environment of the U.P. College of Agriculture to serve not only the nation and region, but also support the training function of the newly established International Rice Research Institute, Dean D. L. Umali in 1962 requested assistance from the Ford and Rockefeller Foundations for the five-year development program. The Foundations responded first with the services of a special review team to assist Dean Umali and his colleagues in the evaluation of the needs and opportunities for expanded programs in instruction, research, and extension. The review team, composed of N. C. Brady and K. L. Turk of Cornell University, and R. D. Osler of the Rockefeller Foundation, worked with several committees of the U.P. College of Agriculture and jointly reported their recommendations in July, 1962. For the implementation of their recommendations in the College's development program, the review team suggested a mutual and integrated approach in graduate education and research involving the University of the Philippines' College of Agriculture and the New York State College of Agriculture at Cornell University. The Foundations agreed that a good way for them to support further development of the U.P. College of Agriculture (UPCA) was through a new sister-university relationship. Accordingly, the joint UP-Cornell Graduate Education Program (UPCO) was developed and implemented in 1963.

At the same time these developments were taking place at Los Baños, Dean C. E. Palm and his associates at Cornell established a Program in International Agricultural Development, with a full-time Director, the first position of its kind in an American university. This program was designed to assist in alleviating hunger, strife, and other obstacles to cultural advancement throughout the world. It is a program of education and research directed at training students from both the United States and abroad, for active productive careers in world agriculture. One of its objectives is to maintain linkages and cooperation with universities and research institutes in developing countries, such as the graduate education and research program with the University of the Philippines.

Phase II presents a review of activities and accomplishments of the UP-Cornell Graduate Education Program covering the period 1963-1972. This program, supported largely by the Ford Foundation, was initiated by a letter on July 19, 1963 from Mr. Joseph M. McDaniel, Jr., Secretary of the Foundation, to General Carlos P. Romulo, President of the University of the Philippines, announcing the approval of a grant to the University of the Philippines for a period of two years for assistance to the College of Agriculture at Los Baños. A Memorandum of Understanding was signed in August, 1963 between the University of the Philippines' College of Agriculture and Cornell University,

through and on behalf of its College of Agriculture, for mutual cooperation in a graduate education, research, and extension program in the Philippines. This initial grant was followed by additional grants for two, three, and two years for a total of nine years. The program terminated on June 30, 1972, followed by a grace period of one year to complete certain phases. These plans for further collaboration between the two universities followed much previous cooperation and interaction, as described in Phase I.

The objectives stated in the first grant are worthy of recall:

1. To cooperate in the campus development and expanded educational, research, and extension programs of the College of Agriculture, University of the Philippines; and
2. To strengthen the International Agricultural Development Program of Cornell University.

It was further stated that "Mutual efforts will be directed toward the education and training of people for leadership in the development of agricultural potentials of the Philippines and other low-income countries."

This program has focused on graduate education and research, plus emphasis on extension, in six major interdisciplinary and resource areas: (1) animal sciences; (2) plant sciences; (3) physical sciences and natural resources; (4) food and nutrition; (5) socio-economics and communications; and (6) plant and animal protection. As the name given to the program implies, the unique feature of UPCO was the inclusion of graduate assistants as active participants from the UPCA and Cornell.

Other services and activities which were initiated and/or supported in one way or another by the program include library development, scientific supply house, computing center, campus development, Association of Colleges of Agriculture in the Philippines (ACAP), and the training of extension workers and nonacademic personnel.

Thirty-two visiting professors and twenty-three graduate assistants from Cornell participated in this program at Los Baños as working colleagues with their Filipino counterparts in teaching, research, and extension. In addition, 26 short-term visiting professors and consultants, plus several administrators, from Cornell were involved. Participants from the UPCA at Cornell included 19 graduate assistants, three visiting professors and three short-term visiting professors. Sixteen staff members on program assistantships and fellowships studied at other universities in the United States. There were five visiting professors from Southeast Asia at Los Baños and approximately 75 Filipino and other Asian graduate students received UPCO support for studies at Los Baños. Almost all of the UPCA faculty were involved in some way with the UPCO program.

Through the efforts of all of these people, substantial progress has been made in attainment of the goals that were established. The purpose of this review is to record the activities and accomplishments in this one volume. The materials summarized herein have been taken largely from the terminal and annual reports of the participants and project leaders and from the annual reports of the U.P. College of Agriculture. Also, inputs and appraisals have been made by the writer based on his frequent trips to Los Baños for observations of progress and for consultations with visiting participants and the College faculty and administration. His interests and experience in Los Baños go back to 1954 when he was a participant in the joint program.

The mutual trust and confidence of administrators of the University of the Philippines, Cornell University, Ford Foundation, Rockefeller Foundation, and other agencies involved of the United States' and Philippines' governments is hereby gratefully acknowledged. It has been a satisfying and thrilling experience to work closely together for the mutual benefit of all and especially to have been a part in the building of a strong educational resource capable of world-wide leadership, the College of Agriculture, University of the Philippines at Los Baños.

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March, 1974



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# List of Abbreviations

A.B.	Bachelor of Arts degree
ACAP	Association of Colleges of Agriculture in the Philippines
ACCFA	Agricultural Credit and Cooperative Financing Administration
ACCI	Agricultural Credit and Cooperatives Institute
AI	Artificial Insemination
AID	Agency for International Development
APC	Agricultural Productivity Commission
ATC	Agricultural Tenancy Commission
BAE	Bureau of Agricultural Extension
BAI	Bureau of Animal Industry
BPI	Bureau of Plant Industry
BPS	Bureau of Public Schools
BPW	Bureau of Public Works
B.S.	Bachelor of Science degree
BS	Bureau of Soils
BSC	Bureau of Soil Conservation
CD	Community Development
CDC	Community Development Center
CECA	Council on Economic and Cultural Affairs—Agricultural Development Council
CIMMYT	International Maize and Wheat Improvement Center
CIAT	Centro Internacional de Agricultura Tropical
CLAC	Central Luzon Agricultural College
CMU	Central Mindanao University
CSSH	Central Scientific Supply House
DANR	Department of Agriculture and Natural Resources
DTRI	Dairy Training and Research Institute
ECA	Economic Cooperation Administration
FACOMA	Farmers' Cooperative Marketing Association
FAO	Food and Agriculture Organization of the United Nations
FHDO	Farm and Home Development Office
FOA	Foreign Operations Administration
ICA	International Cooperation Administration
ICA-NEC	International Cooperation Administration—National Economic Council
IDA	International Development Association

IRRI	International Rice Research Institute
IRRPOS	Interdisciplinary Research Relevant to the Problems of our Society
JCRR	Joint Commission on Rural Reconstruction
LBCC	Los Baños Computing Center
M.S.	Master of Science degree
MSA	Mutual Security Agency
NIA	National Irrigation Authority
NARIC	National Rice and Corn Corporation
NARRA	National Agricultural Resettlement and Rehabilitation Administration
NEC	National Economic Council
NFAC	National Food and Agriculture Council
NRC	National Research Council
NSDB	National Science Development Board
NSF	National Science Foundation
PACD	Presidential Assistant on Community Development
PCAR	Philippine Council for Agricultural Research
Ph.D.	Doctor of Philosophy
PHILCUSA	Philippine Council for U.S. Aid
PRRM	Philippine Rural Reconstruction Movement
RCPCC	Rice and Corn Production Coordinated Council
RICE	Rice Information Cooperative Effort
ROTC	Reserve Officer's Training Corps
SAVI	Society for the Advancement of the Vegetable Industry of the Philippines
SEAMEO	Southeast Asian Ministers of Education Organization
SEAMES	Southeast Asian Ministers of Education Secretariat
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
TCA	Technical Cooperation Administration
TOYM	Ten Outstanding Young Men
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNRRA	United Nations Relief and Rehabilitation Administration
UP	University of the Philippines
UPCA	University of the Philippines' College of Agriculture
UPCO	UP-Cornell Graduate Education Program
UPLB	University of the Philippines at Los Baños
URARTIP	Unified Rice Applied Research, Training, and Information Project
USAID	United States Agency for International Development
WHO	World Health Organization

PHASE I: 1952–1960

The First Cornell-  
Los Baños Program



Chapter I

World Agriculture  
and Cornell

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## CHAPTER I

# World Agriculture and Cornell

### *Role of Universities in Agricultural Development*

As the twentieth century enters its last quarter, no problem is of greater importance to the world than the need to feed the ever-growing population. Without sufficient food to feed its hungry no nation can raise its standard of living or create a firm base upon which to build an industrial economy. Political stability is next to impossible, and therefore the goal of world peace cannot be reached.

The science of agriculture, and related social sciences, thus must provide solutions to the food and population problems of the world. This has long been recognized by governments and scientists alike, but the need for trained agricultural leaders to establish effective teaching, research, and extension programs in underdeveloped areas of the world has never been greater.

Agricultural progress is possible only when there are enough educators to train farmers in the sciences of agronomy, animal husbandry, agricultural economics, entomology, plant pathology, soils, social sciences, and other areas of modern agriculture. Without knowledge of these sciences increased food production is impossible.

But the basic skills are not enough; each nation in every underdeveloped area of the globe has its own peculiar climate and its own peculiar problems of production, whether they be insects or microbes or the climate itself. To find the answers to these problems agricultural study and experimentation are essential. This necessitates problem-solving research, which simply means identifying a limiting factor in the production of a crop or a breed of livestock and seeking a solution that can practically be applied not only in the laboratory or at an experiment station but also in the fields of the nation's farms and in the industries of food marketing and processing. And there are serious problems of rural employment and income distribution. All of these are further aggravated by a lack of institutions and of social and communications systems that will encourage agricultural and economic development.

A third step is then needed—extension. Experimental results are of little use in a developing nation unless they can be communicated to the food producers so that they can apply the knowledge on their farms.

A strong program of agricultural development including education, problem-solving research, and extension requires a joint effort—a partnership among government, educators, industry, and farmers. Such a partnership in agricultural development has long existed in the United States. Since the establishment of the land-grant university more than a century ago progress in agriculture has been rapid and substantial—and is still continuing. Throughout the United States resident instruction, research, and extension teaching are considered the three basic dimensions of agricultural progress. And in the past two decades in some universities a fourth dimension has been added—international agriculture, or the sharing of the knowledge, skills, and experience of America's agricultural scientists with the developing nations of the world in order to speed up the processes of progress and resolution of the problems of food production and population so vital to world peace and stability. People are the key ingredient; so the education and training of people for leadership in the development of the agricultural potentials of less developed countries is the chief function of the international dimension of a university.

For two decades Cornell University has been involved in such a development program with the University of the Philippines College of Agriculture at Los Baños. Although the Cornell-Los Baños program is just one story of agricultural technical assistance, it is in many ways emblematic of the programs other universities have been involved in throughout Asia, Africa, and South America. Yet in many respects the Cornell-Los Baños contract, long regarded as one of the most successful agricultural foreign aid ventures, is unique.

The College of Agriculture at Los Baños was almost totally destroyed during World War II. Faculty members were killed, buildings burned, research data lost forever, varieties of crops and animal breeds that had been established by years of work completely wiped out. The remarkable progress of the College since then has been more of a rebirth than a recovery, and Cornell University has played no small part in that process.

Now, when formal technical assistance between Cornell and Los Baños has ended, and the test of what has been accomplished over the past twenty years truly beginning, the time is appropriate for reflection on and appraisal of the part played by Cornell. For the fourth dimension is not shut off with the ending of this one major project; indeed, the door to world agriculture is just swinging open.

### *World Scope of U.S. Universities in Technical Cooperation*

The beginning of formal United States technical assistance dates back to January 20, 1949, when President Harry S. Truman in his inaugural address outlined the general objectives of the Point Four Program. Of course various forms of primarily economic aid antedated World War II. In those days contributions mainly took the form of aid to disaster victims. Then in 1941 Congress passed the Lend-Lease Act, which was intended solely as a wartime arrangement for economic aid to Great Britain, and in the following year the Institute of Inter-American Affairs was created to provide aid to Latin America.

After World War II the United States became involved in various United Nations organizations, including the United Nations Relief and Rehabilitation Administration (UNRRA), the World Health Organization (WHO), the Food and Agricultural Organization (FAO), and the United Nations Educational, Scientific, and Cultural Organization (UNESCO), which were devoted to aiding needy countries across the globe. In addition, in 1948 the United States instituted the European Recovery Program, also known as the Marshall Plan, to help rebuild Western Europe.

But technical assistance as it has developed over the past two decades finds its origin in the Point Four Program which President Truman called "a bold new program for making benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas." As the program developed, emphasis was quickly placed not mainly on economic aid, as had been the case in previous programs, but on technical assistance, particularly in the fields of agriculture, public health, and education.

Over the past two decades a succession of agencies have been involved with the implementation of this kind of aid. In 1950 the Technical Cooperation Administration (TCA) was established by executive order to begin work on Point Four objectives. The next year the Mutual Security Agency (MSA), which absorbed the duties of the Economic Cooperation Administration (ECA) that had been founded to carry out the Marshall Plan, was created. The MSA concentrated on providing technical and military aid to those underdeveloped areas of the world that the government felt held strategic importance—including the Philippines—while the TCA retained responsibility for other areas. In 1953 the MSA gave way to the Foreign Operations Administration (FOA), which consolidated all organizations responsible for foreign assistance. The FOA in turn was succeeded by the International Cooperation Administration (ICA) in 1955 which then was succeeded by the Agency for International Development (AID) in 1961.

## U.S. LAND-GRANT COLLEGES BECOME INVOLVED

Soon after Truman's introduction of the Point Four Program, President John Hannah of Michigan State University, who was then President of the Association of State Universities and Land-grant Colleges, informed the White House that these institutions were willing to contribute aid in this new venture. The offer was accepted and by the end of 1952 eight universities were involved in technical assistance programs under one of the federal agencies. These partnerships were between the University of Arizona and Iraq, the University of Arkansas and Panama, the University of Illinois and India, Michigan State University and Colombia, Oklahoma State University and Ethiopia, Purdue University and Brazil, Utah State University and Iran, and Cornell University and the Philippines. By 1964, a total of 154 contracts between American universities and foreign countries had been signed.

William I. Myers, Dean of the New York State College of Agriculture at Cornell University when the technical assistance programs were instituted, in an interview in 1972 suggested that in the beginning the government felt that the chief task of the Point Four Program would be "to spread dollars around." In most cases assistance involved sending supplies and equipment overseas—regardless whether or not the equipment was appropriate for the area or the conditions in the country. For example, two electron microscopes were sent to the Philippines: unfortunately, nobody knew how to operate them; and, in addition, power at the College in Los Baños was so irregular that the microscopes could not have been used anyway.

With the offer from President Hannah of Michigan State, however, the Point Four Program took on a new emphasis—assistance in the form of men specializing mainly in agricultural education and research and in public health. "It was quite clear," Dean Myers said, "that this was a service that the colleges of this country could—and probably should—provide in order to help the developing countries of the free world strengthen their own economy, their food production, and their standard of living."

Emphasis was no longer on the United States' "giving" aid to developing nations; instead, the stress was on self-help and self-development with assistance from American technicians. Of course there would have to be continued financial assistance to enable the purchase of supplies and equipment, but this was only a part of the larger program. Knowledge rather than money was given priority.

## THE PHILOSOPHY OF MUTUAL COOPERATION IS BORN

In this change in emphasis was contained the birth of the modern philosophy of mutual cooperation. By no means did the comprehensive form of technical assistance involving equipment plus men trained

in resident instruction, research, and extension comprise a one-way street. The United States could expect returns in the form of greater security, more markets for American products, greater opportunities for the development of American business and industry overseas, and, hopefully, improved foreign relations. Indirect advantages would include the opportunity for some of the nation's best scientists to receive additional experience in areas of study not common to the United States and the chance to receive inputs from some of the brightest young people from other countries who would be receiving advanced training in United States' universities. In addition, some of the research conducted under technical assistance programs would certainly achieve results applicable to American agriculture.

Thus American land-grant universities became involved in the fourth dimension of service—world agriculture. In 1952 the challenges and responsibilities of this kind of program seemed awesome, yet the first colleges to sign contracts for technical assistance also foresaw great rewards for underdeveloped areas, the United States, and the world in general.

### *Cornell's Global Ties*

#### EARLY INTERNATIONAL ACTIVITIES

The Cornell-Los Baños Contract can hardly be considered the first instance of Cornell University's involvement with foreign students and technical cooperation programs. Indeed, in the early days of the University Ezra Cornell and Andrew Dickson White, looked to Western Europe, which was then the center of advanced agricultural science, for methods needed to achieve the goals of American agriculture. Several of Cornell's outstanding professors in those early years were either European or educated in Europe: a professor of veterinary medicine came from Scotland; Cornell's first agricultural chemist was educated in Germany. And in addition, the University sought chemicals and scientific equipment from Europe in an effort to give Cornell leadership among American universities in both agricultural teaching and research.

Foreign students have attended Cornell since it opened its doors. One of the students enrolled in the University's first course in agriculture in 1868 was a Russian. By the turn of the century students were coming from Canada, Japan, Switzerland, and Turkey. University records show that in 1908 17 foreign students from 11 different countries were studying agriculture in Ithaca.

By 1900 Cornell faculty and alumni were already influencing world agriculture. In that year two staff members traveled to China to assist one of the provincial governments. Clinton D. Smith, who graduated

in 1873, was named president of the College of Agriculture at Piracicaba, Brazil in 1908.

According to Dean W. I. Myers, the era of technical assistance can be dated from the mid-1920's when Cornell entered into an agreement with the University of Nanking in China. "The first notable example of international technical cooperation in agriculture was the Plant Improvement Program carried on from 1924 to 1931 by Cornell University and the University of Nanking with financial aid from the International Education Board," Myers noted in an address entitled "Agriculture at Cornell—The First Century" in March 1962. "The success of this program in training Chinese scientists to carry on a program of plant breeding and crop improvement in China led to the great expansion of University contracts under the foreign aid program of the United States in recent years."

#### THE CORNELL-NANKING STORY

The Cornell-Nanking story began on February 4, 1924, when John H. Reisner, Dean of the University of Nanking's College of Agriculture, sent a letter to Professor H. H. Love at Cornell. Dean Reisner wrote:

"We are looking for a plant breeder—a man who is interested in the practical applications of the principles of plant breeding and in getting practical results as quickly as possible. As you probably know, the College of Agriculture and Forestry received a considerable sum from a balance of leftover funds in the hands of the American Famine Fund Committee which had been raised for famine relief in China. The sum given to us is for famine prevention, and one of the projects we are developing is the improvement of certain of the major crops, with the idea of increasing agricultural production and food supply. Our experience so far has been that Chinese crops are very amenable to improvement. In fact, we have already done considerable work in the improvement of wheat, cotton, and corn with very excellent results. There is a tremendous field for this line of work.

"We would want a man who had specialized in the small grains. . . .

"Have you someone to suggest? I hope so and that I may have the privilege of hearing from you soon."

Dean Reisner did indeed hear from Professor Love soon. Through their correspondence and through discussions with staff from Cornell's Department of Plant Breeding—and with the encouragement of Cornell's President Livingston Farrand and Dean A. R. Mann, of the College of Agriculture—a Cooperative Crop Improvement Program was drawn up. Briefly, the program involved the following:

1. The organization and implementation of a comprehensive crop improvement program involving the major food crops of central and northern China;

2. The training of Chinese in the principles, methods, application, and organization of crop improvement;
3. Direct participation by a professor from Cornell's Department of Plant Breeding in the Nanking program for several months of each year, for a minimum of five years, beginning in 1925.

The University of Nanking was to be responsible for the Cornell participants' traveling and maintenance expenses. Cornell agreed to grant sabbatical leaves, when possible, to those working in China and other special leaves, without pay, that might be necessary in the course of the Program. Additional financial assistance was assumed by the International Education Board.

Three professors of Plant Breeding were selected to participate in the Program. Professor Love, who specialized in small grains and biological statistics, journeyed to China in 1925 and again in 1929. Professor C. H. Myers, a specialist in vegetable and forage crops, followed Professor Love in 1926 and returned to Nanking in 1931. Professor R. G. Wiggans concentrated on open-pollinated crops such as corn and forage crops during his 1927 and 1930 trips.

### *The Program Yields Results*

The Crop Improvement Program was primarily concerned with selection of high-yield and high quality crops rather than hybridization, since little or nothing was known about most varieties of China's major crops. The combination of selection and variety evaluation resulted in dramatic improvements in several major crops over the course of the Program. Large gains were made in wheat with Nanking No. 2905 yielding 51.7 per cent more than the control. One barley selection showed a gain of 21.28 per cent. Rice selections resulted in increases ranging from 14.6 to 29.6 per cent. In a four-year test Kaoliang (grain sorghum) exhibited increases of 28 to 48 per cent over farmers' varieties grown in the same tests. Millet was introduced as an important food crop by Dr. Myers. For the first time varieties of soybean, one of the major food crops of China, were comprehensively studied. The field tests were conducted throughout China. In fact, by the end of the Program in 1931, 14 cooperating stations were associated with the University of Nanking's work.

All of the time of the visiting professors from Cornell was not spent on research. The second major goal of the Program, that of preparing Chinese for crop improvement work following the conclusion of the Cornell-Nanking Program, occupied a considerable amount of the time the Cornell professors spent in China. Training involved both formal lectures and summer institutes as well as field observation trips and informal discussions. Largely as a result of this training program, which was considered by the Chinese personnel to be the most valuable

contribution of the Cornell plant breeders, crop improvement work continued to expand, and the seed multiplication and distribution program developed quickly in the years following the end of the formal agreement.

### *Success Despite Internal Strife*

It is particularly noteworthy that the Crop Improvement Program succeeded during a period of great political strife within China. The Republic of China had existed only 14 years when the Cornell-Nanking Program began, and war lords were attempting to establish spheres of influence. Then in March 1927 the Revolutionary Army reached Nanking and all foreign residents of the city were evacuated. Yet in spite of this internal turmoil, the crop work continued. Dr. Wiggins, whose initial visit was cut short in 1927, noted in his 1930 report:

"As stated in previous reports, it seemed doubtful in 1927 that the Crop Improvement Program could be carried on successfully as a result of the political conditions then existing. It is, however, a great satisfaction to report that during those trying times of changing and reorganizing governments, when all foreigners were forced to evacuate Nanking as well as a very large part of the interior where cooperative work was established, when institutions were in a state of upheaval, and when individuals were unable to plan for the future with any degree of certainty, that not a single loss of any crop improvement material occurred. The personnel in charge were so thoroughly interested in the work and impressed with its importance that no sacrifice was too great in order to prevent loss."

In 1930 the President of Yenching University requested the College of Agriculture and Forestry of the University of Nanking to take over the work of its Department of Agriculture. On the basis of arrangements worked out by Dr. Myers and approved by both universities and the China Famine Fund Committee, Nanking undertook a major crop improvement program in the name of Yenching University with control of its financial resources, agricultural experiment station land, and other related assets.

Further nationwide recognition of the crop improvement work being conducted by Nanking led to governmental action. Realizing in 1930 that the Cooperative Crop Improvement Program would come to an end the following year, the Ministry of Agriculture and Mining of the Central Government together with the Kiangsu Provincial Government and the Chekiang Provincial Government organized a crop improvement program to serve the two provinces. Dr. Love was named first advisor of the program, and the University of Nanking was selected as headquarters for training. The National Agricultural Research Bureau was created soon afterward by the National Govern-

ment to develop and coordinate agricultural research in divisions of crop production, animal production, and agricultural economics and marketing. Also located at Nanking, the Bureau continued to expand until the Japanese invasion in 1937 when it was forced to relocate in western China. Following the end of World War II the Bureau returned to Nanking where it continued to function until the area was taken over by the Communists.

### *Long-Lasting Effects*

The effects of the Cornell-Nanking Cooperative Crop Improvement Program are still being felt today. A number of Chinese directly or indirectly associated with the Program have been assisting other nations (including Thailand, Vietnam, and Liberia) in agricultural research. Many of the then experimental varieties of grains are now standard producers.

The greatest influence, however, may well be that the Cornell-Nanking Program paved the way for the many post-World War II technical assistance programs. All of the elements of today's assistance programs—growth of international cooperation and understanding, transfer of technical knowledge to a host nation, concentration on meeting a major national need through a continuing program, and the training of nationals capable of achieving greater advances following the formal conclusion of the assistance—were present in the Cornell-Nanking venture.

The influence of this program on later technical assistance plans may even be more direct. Dean W. I. Myers recalls a conversation with a member of the United States Department of State shortly after President Harry Truman proposed his Point Four Program. "This man told me," Myers notes, "that the success of the Cornell-Nanking Program was one of the basic reasons for the initiation of a more comprehensive program of cooperation between American colleges and their overseas counterparts as an important part of the technical aid program."

The origins of the Cornell-Los Baños Contract itself are certainly rooted in its predecessor's success, according to Dean Myers: "The successful results of the Cornell-Nanking Program were certainly one of the major factors that encouraged us to undertake a similar but more comprehensive contract with the University of the Philippines' College of Agriculture at Los Baños."

### LATER FOREIGN RELATIONSHIPS

Several relationships between Cornell and other foreign institutions followed the success of the Cornell-Nanking Program. In 1941 Dr. Richard Bradfield and two other scientists were involved in planning the Rockefeller Foundation program to improve Mexican crop varieties

and agronomic practices so that hungry people could be fed. Dr. Bradford later served as Regional Director for Agriculture of the Rockefeller Foundation in the Far East to gain American assistance for solving problems of Asian agriculture.

When the Inter-American Institute of Agricultural Sciences was set up at Turrialba, Costa Rica, in 1942, Cornell became involved in this program as well. Many Cornell scientists were associated with the Costa Rica venture, including Professor Homer Thompson, former head of the Department of Vegetable Crops who served as Director of the Institute's Department of Plant Industry for three years.

More recently, in addition to the Los Baños projects, Cornell University and its College of Agriculture have assisted the University of Liberia in raising the quality of its educational program.

The benefits to Cornell from this involvement with foreign students and overseas assistance programs have been numerous. Professors have received new and broadening experience. American students have had the opportunity to live and work in foreign lands. Foreign students in turn have expanded the outlook of the University itself while making valuable contributions in research. Crops and breeds developed during exchange and assistance projects have resulted in improved agriculture in this country, too. Mutual cooperation has resulted in mutual understanding.

The benefits of many of these global ties are constantly being realized at Cornell. Certainly this is true of the Los Baños programs as informal working relationships and friendships continue far into the future.



## Chapter II

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## CHAPTER II

# Los Baños and the Contract

### *History of the University of the Philippines' College of Agriculture, 1909-1951*

Cornell University's involvement in Philippine education antedates even the founding of the University of the Philippines in 1909. Eleven years before, following the conclusion of the Spanish-American War, President William McKinley appointed the first Philippine Commission and named Jacob Gould Schurman, President of Cornell, as Chairman. This Commission recommended self-government for the Philippines as soon as the nation could be prepared for it. The Philippine Commission further suggested that one of the best means of preparing the Filipinos for self-government would be through educational programs.

#### COLLEGE OF AGRICULTURE IS FOUNDED

The College of Agriculture itself was established on March 6, 1909, at the first meeting of the University of the Philippines' Board of Regents and opened on June 14 that same year. Unlike the rest of the University, the College was to be located about four kilometers south of the town of Los Baños in Laguna Province. The site was 73 hectares of wild farmland.

The first classes were conducted in the homes of faculty members and later in tents erected at Camp Eldridge, which was located at Los Baños. The first building was completed in October 1909. The College grew rapidly; by 1941 a total of 22 major buildings housed laboratories, offices, and classrooms, and the enrollment which had grown from 12 students when the College opened to 53 by the end of that first year had reached 722 by 1941. The land area had expanded to 397 hectares of campus grounds and farm lands, including lands obtained through the establishment of an experiment station by Act No. 2730 of the Philippine Congress on February 15, 1918.

The faculty as well continued to grow. In 1920 it numbered 43, reached a high of 88 in 1929, and leveled off at 64 in 1941, largely as a result of a cut in funds received from the University of the Philippines and a reduction in the number of staff assistants. In the year before

World War II closed in on Los Baños, the faculty included 29 professors, 19 instructors, and 17 assistants.

This growth, however, was not accomplished without periods of stagnation, primarily caused by forces outside the College. Dean Leopoldo Uichanco, in a statement to alumni of the College during the Golden Jubilee in 1959, commented on problems the College of Agriculture had faced and overcome in the early days:

"When the College of Agriculture was founded in 1909, its prospects were rather dim, considering the three previous frustrated attempts at establishing a college of agriculture, two in the nineteenth and one in the early twentieth century. It seems a paradox indeed that in a country whose basic economy is agricultural, the occupation of farming has been traditionally looked down upon and not even regarded as a profession of collegiate standing. Hence, a college degree course in agriculture was something unthinkable and in many quarters not worth serious consideration. For this reason the College of Agriculture in Los Baños led a rather hectic early life, a Cinderella among sister colleges."

Even this "Cinderella" existence came close to being ended several times in those beginning days under Dean Edwin Bingham Copeland and his successor Dean Charles Fuller Baker. More than once Los Baños was attacked in the Manila press and the Philippine Congress as contributing nothing to the nation. This first period was also marked by a gradual shift from a largely American faculty to one of Filipinos trained to take over the jobs of instruction and research themselves.

"By slow and painful degree," Dean Uichanco said in 1959,

"step by stumbling step, [the College] has managed to produce over the years a sizable number of alumni who with their solid background of training, their healthy attitude toward work, a highly developed initiative and sense of responsibility eventually proved that the Los Baños graduate is capable of making significant contributions to nation-building. Long before the outbreak of the Second World War, Southeast Asian countries, notably Thailand, also sent their brightest students to Los Baños."

Before the War also funds for the College were never stabilized. Allotments from the Board of Regents of the University ranged from 18 to 30 per cent of the total University appropriation and fluctuated considerably. In 1916 146,785 pesos (\$73,392.50) was appropriated. This jumped to 402,880 pesos in 1920, dropped back to 336,657 pesos within three years, reached 402,740 pesos in 1930, and had declined to 275,582 pesos for the 1940-1941 fiscal year. This sum included no funds for the support of the Experiment Station at Los Baños which had been established in 1919 with 125,000 pesos but had never received any additional funds from the government or the University.

## WORLD WAR II FINDS LOS BAÑOS

The Japanese attack on Pearl Harbor occurred on December 8, 1941, on the Philippine side of the International Date Line. The town fiesta of Los Baños was being celebrated when the first reports arrived.

"Although for some time prior to that date there had been talk of the imminence of war with Japan, nobody believed that it could be more than a remote possibility and that, if perchance there should really be a war, it would only be a shooting war way out on the Pacific Ocean far away from the Philippines," Dean Uichanco wrote in the 1946 Annual Report of the College of Agriculture. Certainly no one at Los Baños expected the College campus itself to be part of such a shooting war—at least not until Japanese bombers and reconnaissance planes began appearing overhead. On December 13 Christmas recess began at Los Baños; the date had been moved up a full week to allow students to return to their homes while transportation was available and safe.

On Christmas Day 1941, following an attack on San Pablo City and the college railroad station, three bombers struck the campus of the College of Agriculture. Molawin Hall, the students' mess, suffered a direct hit and was the first of the buildings to be totally destroyed. Before the end of the war more than fifty were to meet a similar fate.

Fortunately only one casualty resulted from the unexpected raid in spite of the facts that the infirmary was overflowing with those injured in the earlier raid on the railroad station and that many residents of nearby cities, including Manila, had fled to Los Baños, believing it to be safer than their own homes. The raid was timed to take place at the regular mess hour for students in Military Science and Tactics and other boys of military age who had been organized into a training camp by the College's ROTC unit.

"The entire group could certainly have perished from the well-aimed bomb," Dean Uichanco surmised, "but, as chance would have it, the crowd happened just then to have been delayed in Baker Hall. They had a program there in which Msgr. Edward F. Casey, our local Catholic chaplain, spoke. As usual, his talk grew into a long, drawn-out sermon, and the audience could not leave before it was finished."

Other damage to the campus, particularly to water mains and telephone and electrical wires, was minor. Many evacuees, faculty members, employees, and students soon left Los Baños. The army training camp closed three days later. The retreat to Bataan was to follow.

## JAPANESE OCCUPATION

When the Japanese occupied Manila on January 2, 1942, those still at the College did not know whether to stay or leave. No one seemed sure of what to expect from the invaders. Some feared that complete desertion of the campus would mean that the animals, seeds, plants,

books, laboratory equipment, and machinery would be taken by the Japanese or looters. In fact, that very evening an armed band of looters who had previously limited their activities to the stores and homes of Los Baños tried to force their way through the College gate. They were turned back by volunteer guards—many of whom were stranded students—armed with abandoned ROTC rifles and 4,000 rounds of ammunition obtained from the army post at Calamba.

During the first days of the Japanese occupation the College remained open although the formal reopening did not occur until the setting up of the Philippine Executive Committee on January 23, 1942. Teaching was hampered by the fact that few faculty members still remained in Los Baños, but on the whole the campus was quiet. Many members of the staff were forced to take additional jobs because of greatly reduced income and greatly increased living costs. The College itself had next to no money for supplies and was largely cut off from the rest of the world. Scientific journals and books no longer reached Los Baños and, in Dean Uichanco's words, the College became an "intellectual derelict" for the duration of the Japanese occupation.

In September 1942 a recuperative camp for Filipino prisoners of war was established on campus with the prisoners occupying Baker Hall, the student dormitories, the bungalows, and the YMCA building. Then the following May an internment camp for Allied nationals was added. Throughout this period College supplies, equipment, furniture, and facilities were confiscated for use by the Japanese garrison stationed there. Crops were taken, valuable trees in the orchards cut for firewood, fences ripped up, and stock butchered for food. Even Filipinos with connections in the government took supplies and goods from the College, and others, some of whom had once been associated with Los Baños, turned out to be employed by the Japanese military as special agents to watch the campus.

#### GUERRILLAS AND RECONCENTRATION

In December 1942 a guerrilla organization called the Home Guard was organized on the campus under the leadership of an assistant professor. Several other guerrilla groups were secretly located in the area, including Mt. Makiling which adjoined the Colleges of Agriculture and Forestry. Both the guerrillas and the Japanese were interested in locating arms on the campus, including those once used by the ROTC. After the war Dean Uichanco, who was tortured by the Japanese in 1943 and at one time placed under sentence of death for supposedly helping the guerrillas, hiding Americans, and concealing weapons, found out that the guerrillas had also marked him for death because of supposed complicity with the enemy.

The College, however, continued to survive, in spite of the fact that

all the males of Los Baños were interned, or "reconcentrated," for two weeks in August 1943 without food or bedding in the Agricultural Chemistry building on campus following the capture of three leaders of the Home Guards.

Because of these events Dean Uichanco was forced to leave his position on September 30, 1943. Professor F. O. Santos was named to replace him. In the following months burglaries became commonplace on the campus and the Japanese Army, which decided to bivouac on the campus in October 1943, took over more College buildings and continued using facilities and supplies.

As Dean Uichanco reported: "The Japanese were noticeably getting more hostile and suspicious, not only on the campus, but in fact everywhere in the country. By 1944, men and women suspected of any connection with underground activities were garrisoned on mere say-so of informers and savagely maltreated. Many of them were never found again. A number of people thus fell victim in Los Baños. In the meantime, guerrillas on their part were actively kidnapping and assassinating, so that, as elsewhere in the Philippines, the non-combatants in the College found themselves tightrope-walking between the brutal Japanese on one side and the equally ruthless guerrillas on the other."

And yet the College of Agriculture remained open.

#### BURNING OF THE COLLEGE

On New Year's Day 1945 American bombers appeared overhead for the first time. On February 23 local guerrillas, many of them from the College itself, numbering nearly 1000 surrounded the internment camp and held it until Eleventh Airborne paratroopers and First Cavalry Division tanks of the American army liberated the Allied prisoners. A nearly fatal blow for the College of Agriculture came, however, when that same day the troops withdrew to the American lines near Manila, leaving only the guerrillas to protect Los Baños. The Japanese—with reinforcements—were too well-armed and trained; the guerrilla forces were routed, leaving Los Baños without protection.

On February 26 and 27 residential, laboratory, and office buildings were systematically burned and many civilians killed—including a large number of refugees seeking sanctuary in the Catholic Chapel next to the campus. Some of the victims were members of the faculty and staff and their relatives. Most members of the College community, however, were led to safety by the guerrillas and remained away from the campus for well over a month. Finally, on April 4, Dean Uichanco, who had been recalled by the Secretary of Instruction just a week before, made the trip to the College accompanied by Professor G. O. Ocfemia.

In the 1946 report the Dean described the destruction:

"The entire College campus was a picture of gaping desolation. The air stank with the smell of maggoty corpses, which were scattered unburied or lying in shallow graves in the church yard, near the College's main building, and along shaded paths... Only indecently bare cement walls and building foundations [were] standing to mark the scene of thirty-six years of devoted labor by faculty members and students. Roofs had collapsed into nondescript rubble and the ugly stumps of their charred beams and rafters leaned crazily at all angles. Papers, damaged books, pamphlets, notebooks, misshapen remains of balances, microscopes, and other scientific instruments, and spilled chemicals of many hues littered the floor where they had been upset by human jackals in their mad scramble to loot."

Gradually the faculty and staff of the College returned to the campus, although conditions were far from safe, and tried to salvage what animals, materials, and equipment had not been stolen or destroyed. On April 28 the Sixth United States Army occupied the grounds as a recreation camp. The soldiers assisted in clearing up the debris but in the process discarded much that the staff had hoped to salvage for repairs or took what they needed for their own convenience. As a result relations between the soldiers and the staff remained strained until May 22 when Dean Uichanco and the commanding officer agreed that part of the campus would be used for bivouac and the rest for the College.

#### COLLEGE REOPENS

On July 25, 1945 the College of Agriculture reopened its doors with only three buildings ready for use and a faculty of 29. The damage inflicted had resulted in the total loss of 23 academic buildings including Molawin Hall, Soils, Plant Pathology, Biochemistry, the Rural High School's main building and farm shop, the Makiling Elementary School, Agricultural Chemistry, the sugar mill, the Hawaiian Sugar Planters' Insectary, the Old College building, the seed house, the Armory, Poultry, Plant Breeding, Floriculture, the Plant Propagation Nursery, the infirmary, the Animal Husbandry main building, stables, the ice plant, and the Animal Husbandry workshop. Partially damaged structures were Agricultural Education, Entomology, the Administration Building, Agricultural Botany, the main Agronomy building, Baker Hall, the power house, the hog house, an unfinished dairy building, Farm Management, the Seniors' Social Garden, and the chicken houses. The only undamaged laboratory building was Agricultural Engineering.

Residences destroyed completely were four student dormitories, nine student bungalows, all the Copeland Heights houses of self-

supporting students, Copeland House, and the homes of twenty professors. Three others were damaged while one professor's home and the guard house were untouched. Both the campus bridge and the Experiment Station bridge had been dynamited and the latter was left impassable except on foot. Irrigation dams were destroyed, as were most telephone and electric lines.

Most of the farm animals, nearly all hand tools, all planting material of sugar cane, rice, tobacco, root crops, vegetables, and forage grasses—many resulting from years of breeding and selection—were gone. Close to half the trees in the College orchards were destroyed. One hundred eighty books were left from a library of 20,000 volumes. All the museum collections of crops and botanical specimens, insects, plant diseases, soils, and vertebrates were lost. Nearly all the administrative records were burned. Research data, unpublished manuscripts, lecture and laboratory notes had all met similar fates. Total damage was estimated at 896,209.95 pesos, but much of what had been destroyed was considered priceless and irreplaceable.

#### REBUILDING BEGINS

The occupation by the U.S. Army did have advantages for the College in those first months after it reopened. Books were donated to the library, electricity was supplied from its generator when the current was obstructed or simply not available, slops from the kitchen were given for feeding the livestock, supplies such as lumber, nails, and other construction materials were available, and, when the Army completed its pullout in March 1946, tools and some machinery were left behind. The Army had also provided protection from Japanese hiding in the area and from Filipino bandits.

By mid-1946 the College of Agriculture was actively trying to rebuild itself. Thirty-five hectares of pasture lands had been cleared, lawns were trimmed by hand since no lawn mower was available, student gardens were started, the orchards were weeded, Experiment Station land was bulldozed and planted with corn, and attempts were made to reestablish breeding stocks of several animals. Most reconstruction efforts however, were directed toward restoring and repairing damaged buildings since not enough money was available for any major construction project.

Then in 1946 the Philippine-United States Agricultural Mission headed by Dean Leland E. Call of Kansas State Agricultural College visited Los Baños as part of its survey of the Islands. The report that resulted from this visit was to have great implications for Los Baños in the years to come. The report stated:

“The College of Agriculture has produced significant research findings in spite of not having sustaining appropriations. This has been accomplished through individual efforts of the faculty and of its students,

which indicate that the staff is welltrained and has a knowledge and appreciation of the value and methods of research. . . .

"The Mission recommends that agricultural research at the College of Agriculture at Los Baños be encouraged and strengthened and that laboratories and other facilities for research (barns, shops, equipment, etc.) be built as quickly as materials become available; that ample and continuing appropriations for research at the College be provided by legislative enabling acts, similar to the Hatch and Adams Acts of the United States Congress; and that the research organization authorized by Act. No. 2730 [an act of the Commonwealth passed February 15, 1918, establishing an experiment station at the College] if built up through continuing appropriations might be called 'Research Institute of Tropical Agriculture.'"

#### AID UNDER THE WAR DAMAGES ACT

On April 30, 1946, President Harry Truman signed into law the Philippine Rehabilitation [War Damages] Act, which appropriated \$620,000,000 to meet war damage claims and for Philippine government reconstruction projects. Twelve agencies of the United States government were authorized to provide assistance in whatever programs resulted. A total of 10 million pesos of these funds was directed to the University of the Philippines, of which 517,229 pesos was allocated to the College of Agriculture. Over the next several years the War Damage Funds were used to purchase equipment and books, but the greatest portion, 470,546 pesos, went toward major rebuilding projects. As of the end of October 1950 four dormitories, nine student bungalows, an infirmary, Molawin Mess Hall, a nursery building, Poultry Husbandry, Animal Husbandry, Chemistry, Home Economics and the Makiling School, Plant Pathology, and the Rural High School, were all rebuilt. Regular University of the Philippines funds were used to build an ROTC target range and a wing of a dairy building, and to relocate poultry houses. This, however, was only a start at rebuilding the College.

Later, in his 1955 Progress Report to the ICA, Dean Call commented on the state of affairs at the College of Agriculture during this hectic period. He said:

"While War Damage Funds made possible the restoration and re-equipping so the College could operate, the money fell far short of restoring the institution to its prewar condition. Only a part of the instructional and service buildings could be rebuilt. No faculty housing could be provided; livestock could not be replaced; utilities were only partially restored; equipment for the laboratories and farms was far from adequate, and only a beginning could be made in the restoration of the library."

Clearly another answer to the almost insurmountable problems facing Los Baños had to be found.

## LOS BAÑOS STRUGGLES FORWARD

During the 1949-1950 and 1950-1951 academic years the College continued to struggle forward. The Los Baños area was still unsettled; robberies and other crimes frequently occurred. Farm produce and fruits were constantly being stolen, and dissidents roamed throughout the countryside. Little trouble, however, occurred on the campus itself, a notable exception being the robbery of the College safe and killing of a College guard in April 1948.

Gradually the physical plant expanded as construction projects were completed, and various departments, which had been housed in the Agricultural Botany building, Agricultural Engineering, and the Seniors' Social Garden when the College reopened, were able to spread out. Other departments, however, remained homeless and were forced to share crowded facilities.

Quantities of supplies and equipment were also slowly expanded. In 1950, for example, 89,577 pesos was spent for equipment and 53,320 pesos for general supplies. Included were plows, tractors, planters, a mower, and a cultivator which together with machinery purchased in previous years or donated (particularly by UNRRA in 1947) gave the College more machinery than it had ever previously possessed. Unfortunately much of this equipment could not be operated in the climatic conditions of the Islands as effectively as in the temperate areas of the United States. In addition, by the end of the 1949-1950 academic year the library had expanded to include 4,449 books, 805 pamphlets, 4,487 periodicals, 17,805 serials, and 209 theses manuscripts.

Living conditions in particular remained primitive since the new dormitories had not been finished. By mid-1950 students were still living in private homes in Los Baños or under makeshift conditions of the Agronomy Department or in reconverted poultry houses acquired in 1945.

The 1950-1951 academic year saw substantial improvements in some areas, little progress in others, and a new sign of hope from the direction of the United States. To begin with, 5,000 pesos was appropriated for the repair of the Bocobo bridge which, according to Dean Uichanco, was "one of the only two bridges connecting the upper campus, the Department of Animal Husbandry and most of the pastures, the Experiment Station grounds, the College of Forestry, and the Makiling National Park with the outside world." Also more equipment was purchased, largely thanks to an additional appropriation of 108,537 pesos from the U.S.-Philippine War Damage Commission. Thirty-seven hectares of land were planted in the first semester 1950-1951, 31 in the second, and 51.3 during the summer session. Canals

were reconditioned for irrigation, and advances were made in weed control.

But these improvements were barely enough to offset losses and stagnation in other areas. Student enrollment had increased to 536 for the first semester and 445 for the second, but the staff was not showing similar growth. The faculty had totaled 70 in the previous year but numbered 66 in 1950-1951. Eight-four research projects were completed during that period with another 157 still in progress, but most of these were undergraduate thesis projects required for graduation. The Agricultural Economics, Soils, and Language Departments were still without permanent facilities. No telephone system was installed. There was no money for road repair or improvements in the water system. Chlorination had been stopped in spite of a high coliform count because of the unavailability of proper chemicals, and everyone on campus was told to boil all water. Electricity was irregular. Crops and animals were sold, and crop sharing and tenancy were used to obtain labor for keeping the fields. Only 23 books were purchased for the library, although another 135 volumes were donated. Although 11,000 pesos was spent for security guards, there were still too few guards to prevent continued theft of property and looting of crops. Fences lost during the war had not been replaced for the most part and the fields could not be protected.

In the 1950-1951 Annual Report of the College of Agriculture Dean Uichanco stressed the need for more funds. From 1941 to 1949 appropriations from the University had increased from 275,582 to 358,870 pesos, but even so this showed a drop from 21.21 per cent of the total University budget to 20.05 per cent. Appropriations for salaries had gone up 9.7 per cent and sundry expenses 32.9 per cent, but the cost of operating the College had gone up 50 per cent! In addition, a 22.2 per cent decline in technical personnel had occurred and another 42.8 per cent decline in clerical personnel. These trends had to be reversed and additional sources of funds—even if only temporary—located if the College of Agriculture was to survive as a viable institution.

#### BELL MISSION REPORTS ITS FINDINGS

In 1950 the Economic Survey Mission to the Philippines (also called the Bell Mission) visited the Los Baños campus and upon returning to the United States made known its recommendations with regard to Philippine agriculture. The report to the President included the following statements:

“One of the bright spots in Philippine agriculture and forestry comes from the enthusiastic and competent Philippine scientists who are engaged in this public service. Their educational preparation

is a splendid tribute to the foresight and perseverance of a number of strong educational leaders of the past generation. These men made their contributions while on the staff of the University of the Philippines' College of Agriculture at Los Baños.

"Los Baños has long been known and highly regarded by agricultural scientists and foresters in Southeast Asia and in other parts of the world. Every mission that has dealt with Philippine agriculture has recognized the constructive and vital role of the institution in the training of the research, extension, and instructional personnel of the country. There seems to be considerable evidence, however, that the institution is losing ground. It lacks the funds to attract and hold the younger men on the staff and it needs the stimulating exchange of personnel with other countries. Most of this is doubtless due to the war; but whatever the reason, it is of primary importance to correct the situation. The rehabilitation of its buildings and equipment, including livestock, should be completed as quickly as possible and money provided to raise the salaries of the staff."

The Bell Mission further recommended that a Central Experiment Station should be established in the Philippines and that it should be located at Los Baños and should receive considerable financial support.

During 1951 the ECA undertook a long-range plan designed to implement the Bell Mission's recommendations. Allocated to the College for a five-year period was over \$600 thousand in dollar aid and additional peso counterpart funds. The first load of equipment, construction materials, books, and general supplies arrived in August 1951. Tractors, microscopes, cultivators, a spectrophotometer, power sprayers and dusters, a grain drier, a rice mill, an air-conditioning unit needed for various phases of research with plants and animals, meteorological equipment, fertilizers, and planting materials were included. Plans for construction and repair were drawn up, and consideration was being given to a plan for supplementing salaries and wages. Overseas training of junior staff members was discussed.

"Also," Dean Uichanco noted in the 1950-1951 Annual Report, "arrangements are being made for a cooperative relation with some American agricultural institution, such as Cornell, whereby its faculty members will be assigned to this College from time to time...."

### *Cornell, Los Baños, and the First Contract Negotiations*

The assistance program of the ECA, which was to become the Mutual Security Agency (MSA) before the end of 1951, continued while early negotiations for the first contract between Cornell University and the College of Agriculture of the University of the Philippines got under way.

Although it was soon decided that the contract, if eventually approved by all parties involved, would be directly between Cornell and

Los Baños, there were several governmental organizations on both sides of the Pacific that would serve as not-so-silent partners in the venture (See Figure 1).

Technically speaking the United States Department of State was responsible for the operations of the ECA, MSA, and the two other organizations—the FOA and the ICA—that in 1953 and 1955, respectively, were to continue the governmental line of succession. Although the headquarters for these bureaus were in Washington, D.C., offices were also established in those nations involved in the Technical Assistance programs.

The Special Technical and Economic Mission (or more simply the Operations Mission) of the MSA in Manila was the largest of these offices in any country in 1952. Included in the staff were 115 technicians, administrative officials, and consultants. The Operations Mission was composed of seven divisions—Agriculture, Industry and Public Works, Public Administration, Education, Fiscal and Trade Policy, Labor and Social Welfare, and Public Health. At the time of contract negotiations the Agricultural Division which was headed by Director Edward Bell of the 1950 Economic Survey Mission to the Philippines, was the largest with 24 staff members and three departments—Products, Extension, and Research. Of these the Research Department was under Dean Leland Call, who had directed the 1946 United States-Philippine Agricultural Mission and who was soon to play a significant role in the early days of the Cornell-Los Baños Contract as the program's contact officer in the Operations Mission.

For the purposes of the contract the National Economic Council (NEC) of the Philippine government was roughly comparable to the MSA and its successors. The Cornell project was primarily handled by the Office of Foreign Aid Coordination although other branches including Training and Finance were involved from time to time.

More directly affecting the progress of contract negotiations and later the contract program was the Philippine Council for United States Aid (PHILCUSA). This organization, with status approximately comparable to the Operations Mission from an administrative viewpoint, was appointed by Philippine President Quirino. The bureau had no legal status but was empowered by the President to pass on all MSA aid. Although theoretically the bureau was nonpartisan and nonpolitical, members of the Cornell group that had to work directly with PHILCUSA frequently thought otherwise. Professor Montgomery Robinson, who was to be named first Project Leader, noted in the report covering his March-May 1952 trip to Manila and Los Baños that PHILCUSA had caused several headaches during contract negotiations, particularly when they suggested reducing the number of Cornell men to be assigned to the College and inserting themselves in

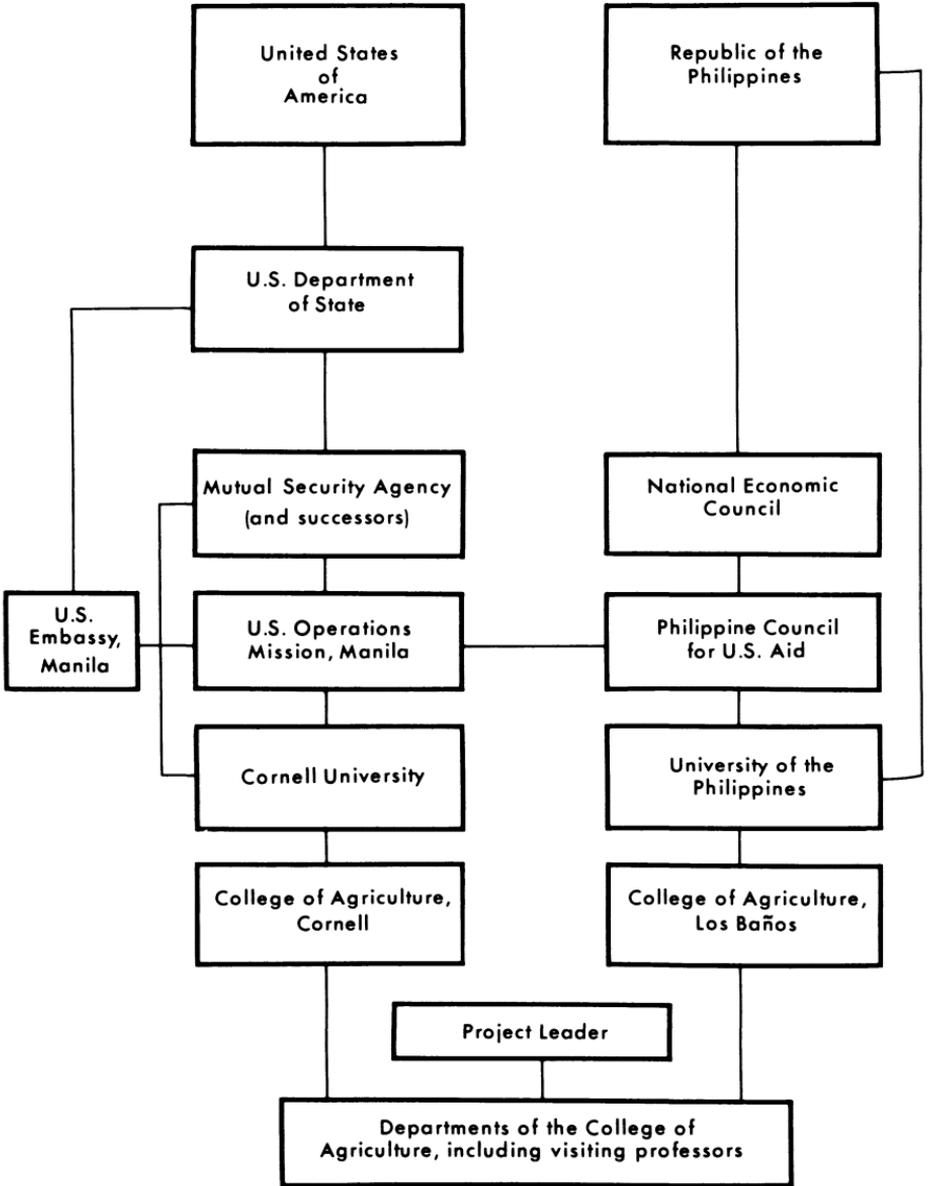


Figure 1 **Governmental Bureau Organization behind the Cornell-Los Baños Contract\***

\*Adapted from Nyle C. Brady, "Introduction and General Information Cornell-UP College of Agriculture Contract" 1954.

place of MSA in the official Contract so that they would have more control over the program.

#### CORNELL ENTERS THE PICTURE

According to Dean Call, the ECA first became directly involved with Los Baños on January 27, 1951, when a formal request for support for three projects was submitted to Washington from the ECA Mission in Manila. The three projects were for fertilizer distribution, irrigation pumps, and for what was to become the Los Baños technical assistance project. Cornell became involved soon after.

Dean William I. Myers recalls that in these early days of technical assistance Cornell received invitations from several countries, including Taiwan and Thailand, as well as from the Philippines, to enter contract arrangements.

According to Dean Myers many factors influenced the decision to go to Los Baños. First, Cornell had had some involvement with the Philippines dating back to the 1898 Philippine Commission and, in particular, with the College of Agriculture, where, for example, several outstanding graduate students trained at Cornell had become members of the faculty. Second, it appeared that adjustment in the Philippines would be somewhat easier than in other countries because political and cultural ties had long existed between the Philippines and the United States and in addition the government there was a democracy. Of greatest practical importance, however, was the fact that the country was comparatively stable. "We realized," Dean Myers recalled, "that helping another institution to strengthen its services was a long-run project. You can't do it in a year, or even five years. I think the factor that caused us to accept the Philippine offer was that it did provide a reasonable certainty that we would have ten or fifteen years as a minimum in which to make progress."

At this time Dr. Roland Renne, who had been a visiting professor at Cornell in Agricultural Economics during Dean Myers' term as head of that department, was director of the Operations Mission in Manila. His encouragement, as well as his personal friendship with Dean Myers, was another factor in Cornell's decision to begin negotiations with the University of the Philippines.

Cornell was also well aware of the problems facing the College of Agriculture during this period. These were largely related to the war—the loss of property, research data, animals, and staff—and the fact that Los Baños had been isolated from world developments in scientific agriculture during a period when both production and research greatly expanded. Other general considerations included inadequate financial support, particularly for vital research. In this area the College had never had any significant assistance, and Cornell was known for its

extensive research program in every phase of agriculture. "They had no experimental fields of any consequence," the Dean noted. "They tended to make their studies greenhouse experiments. You can learn something that way, but you can't immediately apply a pot experiment in a greenhouse to a farm."

Dean Myers also felt that Cornell might be able to help improve the cool relationships existing between different agricultural institutions (including Los Baños) and the Department of Agriculture and Natural Resources (DANR) of the government. A lack of cooperation existed, in Dean Myers' opinion, to the point that they regarded each other as rival institutions. In the long run this situation hurt the farmers of the Philippines since, although the College had the stronger research program, the DANR was responsible for all extension.

#### LAND-GRANT CONCEPT

With the strengths of Cornell and the needs of Los Baños in mind, the general objective of the program that was to be formalized in the Contract on July 1, 1952, might best be stated as helping to institute at Los Baños the land-grant concept of university service as adapted to the economic and cultural status of the Philippines. Dean Myers has summed up the situation:

"Of course you can't take a reproduction of an American college's administration, set it down in a foreign country, and expect it to work as is. But, despite the differences, certain basics are necessary.

"One of these is a strong program of research based on problem solving. You need, for example, to find out what the serious problems are that limit food output and what modern research can contribute to solving these problems and increasing production. What's limiting major crop output? Is it a nutrition problem? A problem of fertility? Is there a need for better seed selection or breeding? What about poor drainage or lack of water?"

Such indeed was the type of research the Philippines needed—experimentation directed toward finding solutions to specific practical problems that beset the food and agriculture industries of the country.

Problem-solving research also would have broad implications for the teaching program within the College of Agriculture. Much of the instruction was based on information applicable to the temperate climate and conditions of the United States—and did students in the College very little practical good. Information related to Philippine conditions was vital, and problem-solving research could provide this knowledge. Also, students would receive a great deal from proximity to and participation in this kind of research.

The third part of the land-grant concept, in addition to problem-solving research and instruction, was extension. Better ways had to

be found to communicate research results and information to the people who farmed the land and worked in agricultural industries. This involved close cooperation with other Philippine agencies and institutions concerned with agriculture. Dean Myers further notes that:

"Included in the land-grant philosophy of service is the concept that these institutions were created to contribute to the public welfare. That means that there should be mutual cooperation so that collectively they can do a good job. And the way to get financial support—which was vitally needed in the Philippines—is to show the citizens, the farm leaders, and industrialists, that you are contributing to the improvement of agriculture and food production, and that you are doing this as a return for the money that they invest."

#### BENEFITS TO CORNELL

Dean Myers and other officials and faculty of the University did not, however, view participation in technical assistance as a "one-way street." They were well aware of the benefits that would accrue to Cornell from such an arrangement.

Of course, they recognized that in the long run any progress in improving world agriculture has the potential of benefiting the United States. More food and higher standards of living lead to political stability and a firm base for an industrial economy, both of which are important in the quest for world peace. Yet while this is the major goal of the philosophy of mutual cooperation, other, more specific benefits from international involvement on the part of a university can be cited.

Dean Myers has asserted:

"Why does any university undertake a project to promote public welfare internationally? Intelligent selfishness.

"You know that your staff will benefit from being overseas, as will graduate students who have the opportunity to engage in foreign service. But it must be emphasized that no reputable university would go into an international program solely, or even primarily, for selfish reasons. But I also think no university ever takes on a public service job that it doesn't benefit from: not financially, but in the satisfaction of helping the people of that nation and in the additional training and experience of its faculty and students."

Looking back on the negotiations, Dean Myers believes that underlying the Philippine College of Agriculture's interest in developing a technical assistance contract with Cornell were the possibilities for improving the physical plant of the College and for obtaining needed equipment and supplies to rebuild Los Baños academically and in research. "When we signed the Contract," Myers recalled, "I don't think the staff at Los Baños appreciated that the most important part of the program would be the training of men for research and teaching. They felt it was primarily a case of obtaining equipment and funds for re-

building, but they realized after they had gotten started that there was more to it; you needed to have young, competent men to take over and this would be the most valuable part of technical assistance.”

On May 13, 1952, following months of negotiations between Cornell and Los Baños, with MSA and PHILCUSA standing in the background, the Cornell-Los Baños Contract was signed. The effective date was July 1, 1952.

### *The First Contract*

The Contract between the College of Agriculture of the University of the Philippines at Los Baños and Cornell University was the first agricultural technical assistance contract developed through the Agricultural Division of the Mutual Security Agency of the United States government. In that respect it was the forerunner of many others soon to follow.

#### CORNELL'S RESPONSIBILITIES

The Contract specified three general duties that Cornell was to perform: 1. Provide specialists in various fields of agriculture, as agreed upon by both parties, up to a maximum of ten. Initially, the specialists were limited to four. These visiting professors were to involve themselves in teaching, research, and demonstration suited to the needs of the College; 2. Provide assistance and advice in the selection and use of supplies and equipment at Los Baños; 3. Assist the College in the selection of staff and students for training in the United States and in making arrangements with the necessary organizations and institutions for this training.

The advance team of visiting professors was originally to include an agricultural extension specialist, an agronomist, an agricultural economist, and an agricultural engineer. A “Chief Adviser,” who soon became known by the less formal title of Project Leader, was also called for. In working out the practical details, however, it was later agreed to combine the position of extension specialist with that of project leader and to make a plant pathologist the fifth member of the advance team.

For these services Cornell and the visiting professors were to receive the following reimbursements: (1) Salaries. Cornell personnel were to be paid from the date of departure from the United States until their return at a rate not exceeding 120 per cent of their regular salaries; (2) Transportation costs and travel allowances. Expenses for traveling to the Philippines and home again for the field staff, for their dependents, and for authorized Cornell administrators or officials reviewing the project were to be paid by Contract funds, too. Provisions for shipping personal effects and private automobiles as well as teaching

materials were also included; (3) Out-of-pocket expenses. Cornell was to be repaid for such miscellaneous expenses as passport fees, medical services, office supplies, telephone charges, and similar costs; (4) Vacation and sick leave. Cornell was to be reimbursed for the regular leave granted the field staff; (5) Overhead. Cornell was to receive overhead costs at the rate of 10 per cent of the base salaries of the visiting professors assigned to the project.

#### LOS BAÑOS' DUTIES

Several duties of the U.P. College of Agriculture were listed as well: (1) Living allowances. Based on the Standardized Government Civilian Allowance Regulations for Foreign Areas, the College was to pay in advance living allowances, as were paid by MSA to its personnel, to the Cornell field staff; (2) Housing. The College was to provide accommodations for visiting personnel and their families without charge; (3) Medical and hospital care. All personnel and their dependents were entitled to use of the infirmary to the extent allowed local personnel; (4) Office space, facilities, and administrative services. These were to be provided for all members of the visiting staff; (5) Employment of local personnel. The College was to hire local labor needed by the field staff and approved by the College administration.

Other provisions of the Contract detailed the documentation procedures for reimbursement; directed Cornell to compile annual reports and a final report containing the findings, observations, and recommendations of the field team; and specified selection and dismissal procedures for individual visiting professors. The period of the Contract was set at 30 months with the added provision that it could be terminated by the College upon 30 days notice in writing to Cornell.

The ceiling for the 30-month Contract between Cornell and Los Baños was set at \$250,500. When the Contract was terminated in favor of a second Contract in mid-1954, \$225,000 had been issued to the College of Agriculture by MSA and its successor, FOA, for reimbursing Cornell. This was not, however, the only money appropriated during the first contract period to Los Baños. Funds were also available for purchase of commodities and construction through the Operations Mission in Manila in the form of technical assistance funds and for participant training—which was not covered under contract funds until the start of fiscal 1955.

Peso support for the College came from three sources: the regular University of the Philippines allotment; appropriations from PHIL-CUSA; and counterpart money. ICA counterpart funds were made available through the National Economic Council (NEC) and were used for paying overseas transportation, overseas freight charges, transfer allowances for incidental expenses occurred by visiting professors and

their families while traveling, living allowances and utilities reimbursements for visiting staff, medical services, and miscellaneous items.

### *Plan for Meeting the Objectives*

As indicated by the terms of the Contract, the objectives of the Cornell-Los Baños project were the rebuilding of the College of Agriculture in terms of physical plant, equipment and supplies, the training of younger members of the staff, and the development of an ongoing research program. This latter objective was to center in the development of a Central Experiment Station supported at first by aid from the United States, then by contracts and agreements with private industry and, most important, regular financial support from the University of the Philippines and the Philippine government.

#### THE WORKING PLAN

The working plan that was designed at the beginning of the project and then developed further on the basis of the experiences of the men in the field and those administering the project from Ithaca in the first years involved four major parts: (1) selection of professors and project leaders who would then serve as working colleagues of the Filipinos; (2) teaching at Los Baños and training of personnel from the departments of the College; (3) concentration on problem-oriented research; and (4) the development of physical facilities and equipment through aid and donations and with the advice of the Cornell scientists and administrators.

Close cooperation between the visiting professors and the Los Baños' staff was essential to the success of the program. Selection of the visiting professors was therefore one of the most important parts of the plan. These men would in fact serve as staff members of the departments they were assisting, with all the rights and responsibilities of the Filipino members. The original plan called for each visiting professor to work closely with one Filipino who was termed his counterpart. This method of operation proved generally successful from both points of view. The visiting professor's transition to Philippine customs, social structure, and established channels within the department and the College was considerably eased thanks to the experience of the counterpart. The counterpart in turn gained much from close association with the visiting professor in his teaching and research activities.

#### SELECTING THE VISITING PROFESSORS

The importance of selecting the proper men to fill the positions of visiting professors was of course realized long before the Cornell-Los

Baños Contract was signed. Specific provisions were included in that document with regard to such selection and, in case of difficulties, recall procedures. The Contract stated that no personnel would be assigned to the Philippines without prior written approval by the College of Agriculture as to the qualifications, lengths of stay, and salaries. In addition, Cornell was required to submit a detailed report containing the particular professor's professional background and a job description to the Mutual Security Agency in Washington at least 15 days before the scheduled departure date.

The Contract further stated: "At the request of Agricultural College, Cornell will terminate the assignment of any of its personnel whose conduct or work is not satisfactory to Agricultural College, or whose services are no longer required in the judgment of Agricultural College for proper prosecution of the work or for security or other reasons." In effect, the College was thereby given the power to have any visiting professor's stay terminated if ever or whenever they felt it advisable. In the eight years of the project, however, the College exercised this power only once, and then with the concurrence of Cornell.

During the eight years of the Contract a total of 51 professors served at Los Baños—not counting Professor Margaret Stone, who accompanied her husband, Professor Earl Stone of the College of Forestry Contract, and voluntarily served in Agricultural Botany, or those who were at Los Baños under the College of Forestry agreement. In all, 80 man-years of work were contributed by the visiting staff. Thirty-five of the visiting professors came directly from Cornell. Another nine graduated from Cornell, thus bringing the number of professors directly associated with the University to 86 per cent of the total. In all, 10 per cent of the faculty of the New York State College of Agriculture at Cornell served from one to two years at Los Baños under the Contract.

Even though some of the visiting professors were not from Cornell, they were well known in their particular field and were acquainted with colleagues at Cornell. In fact, one of the first professors to be selected, Professor H. K. Hayes in Plant Breeding, was a distinguished plant geneticist from the University of Minnesota.

The large number of Cornell professors selected for participation in the program is one possible reason for its unprecedented success. Dean Myers has commented:

"It was my personal feeling, and I think it was the general feeling at Cornell, that we weren't acting as an employment agency. In contrast, there were other institutions that set up organizations to contract for overseas programs and hired people from anywhere. I have no particular criticism of that; probably they performed a useful service. But on the other hand, I do not believe that it's the way a leading university such as Cornell should operate in this kind of program.

"We felt that by enlisting on our staff professors whom we didn't know intimately—who may have been thoroughly competent but who weren't familiar with the operations of the university and the Cornell College of Agriculture—it would be harder to get as good teamwork. And I thought, if we took on the job we ought to provide a major part of the staff.

"We did not send any man to the Philippines that we were not proud to have represent Cornell. These weren't men we could spare easily. We sent some of our best men, including heads of departments, not only because they would find the experience valuable, but because if you want to do a good job, you've got to be just as careful about the quality of the staff that you send overseas as you are on your own campus—maybe even more so since the job is usually more demanding."

#### SELECTION AND DUTIES OF THE PROJECT LEADERS

Perhaps even more important was the selection of the Project Leaders for the program. A total of four men served in that capacity: Montgomery Robinson, June 1952–July 1955; Marlin Cline, July 1955–July 1956; George Trimberger, July 1956–July 1957; and Halsey Knapp, July 1957–June 1960. Dean Myers has noted that Cornell wanted to keep the Project Leaders in the Philippines longer than the 12 to 24 months usually spent by visiting professors. One practical reason for this was the need for continuity, particularly during this first period when working relations were not completely worked out and it was more difficult to bring in new men. (Both Professors Cline and Trimberger, in fact, served as visiting professors before being named Project Leaders:)

The duties of the Project Leader were numerous and varied. As chief administrator of the program at Los Baños, he was responsible for most of the paperwork, including the writing of the annual project reports. He had to look after the processing of arrivals in Manila and at Los Baños; the details of shipping automobiles and household effects; departure procedures for Filipino trainees and returning staff; the ordering of supplies and equipment and the proper routing procedures (which depended on where the money was coming from and to whom it was going); clearance procedures, customs information, accumulated leave for the visiting faculty, income tax exemptions, medical bills, etc.; and the approval of contract nominees by the College. He was also involved in major administrative decisions at the College that affected the program as well as the yearly budget. He participated in conferences in Manila—usually every week—with the head of the Operations Mission and the chiefs of the various divisions and sections under him to report on progress at the College.

The Project Leader also had unofficial but equally important duties. It was his responsibility to do his best to see that amicable relations were maintained both within the project team and between team members and the Filipinos. Differences of personality and outlooks on how to proceed in teaching and research, inevitable though they might be, had to be reconciled for the good of the project and the good of the College.

According to Halsey Knapp, the most important of these unofficial duties for the success of the entire program was instilling a sense of unity and common purpose among the members of the project team on the one hand and between the members of the team as a whole and the Philippine faculty on the other.

"Sometimes a man who is keen and able, skilled and experienced in his own field, finds it difficult to give much consideration to other parts or phases of the total enterprise," Professor Knapp said. "He's thinking about his own responsibilities. Sometimes he doesn't realize that the whole effort must fit together if it is to succeed—must be one undertaking of which he is an important part, but still just one of many important parts."

As an example of this kind of difficulty, the Project Leaders, who had to keep Manila apprised of the progress in different areas at Los Baños, ran into problems with getting statements about departmental progress from visiting professors. "They were simply too busy working on what from their point of view seemed much more important than sitting down at a desk," Knapp stated.

This kind of dedication, however, also had great advantages for the success of the program. The visiting professors did not remain aloof from the Filipino staff and worked with them side by side in the fields and in the laboratories. This naturally helped solidify respect and promote a feeling of mutual involvement and concern.

#### PARTICIPANT TRAINING AND RESIDENT INSTRUCTION

The second part of the working plan involved teaching and the training of Los Baños staff, usually in the United States. Project Leader Robinson noted in the First Annual Report that classroom teaching by the visiting professors was not considered in line with primary Contract objectives in some quarters but it was soon discovered that teaching undergraduates was essential to the success of the program for several reasons. First of all, without this assistance the Los Baños staff would not have been able to devote much time to research since the teaching load was so heavy. Lack of such time would mean failure to reach one of the main goals of the project—the establishment of a continuing research program. Second, classroom teaching by the visiting professors presented the chance to demonstrate good teaching methods

including greater use of visuals, more emphasis on the seminar, and a less structured lecture situation with student participation. Introduction of much new material into many courses was also made possible.

The training of staff involved more than overseas study, although that was a major part of the program and the opportunity that, in the long run, had the most lasting effects on Los Baños. Student assistants were employed to help the visiting faculty and the Filipino staff, primarily in the field research, a situation which greatly enhanced the quality of their education and so was particularly important since many later became members of the staff. Overseas trainees were selected from the most promising members of the junior staff and, even before the Contract was signed, were being sponsored by MSA. Part of the responsibility for selecting the trainees, helping them decide where they might best pursue their studies in the United States, and assisting in finalizing arrangements also fell to the visiting professors. In addition, graduate training of several Filipinos in departments of the College at Los Baños was undertaken right on campus with the aid of the Cornell team.

#### PROBLEM-SOLVING RESEARCH

Due to lack of equipment and facilities in many departments the third phase of the plan, research directed toward finding solutions to major problems in Philippine agriculture, took somewhat longer to establish. The original plan called for assessments of the situations in the various departments by the visiting professors, organization of coordinated research programs, and, finally, implementation. Most of the research in the College was, at the time of the Contract's signing, thesis experimentation conducted by senior undergraduates. Also included in the overall outline for assistance in this area was the organization of a Central Experiment Station at the College and the hiring of personnel who would spend full time working there. Many of the early professors were in fact chosen primarily because of their skill and experience in agricultural research.

#### DEVELOPMENT OF EQUIPMENT AND FACILITIES

The development of the physical plant and the acquisition of equipment, while being of importance for the teaching program, was closely linked with the growth of the research activities at Los Baños. Prior to the Contract, aid funds for reconstruction had been received from the ECA, among other organizations, and some progress resulted. But conditions were still critical; for example: the Department of Agricultural Economics was located in the Entomology and Plant Pathology Buildings and the total facilities of the Department consisted of two desks, two chairs, and a "baby" Monroe calculator; plumbing and

electrical facilities had not yet been installed in the new Soils Department Building and there was a severe shortage of even the simplest equipment—beakers, test tubes, stoppers, flasks, etc.; the Department of Entomology was without books, equipment, and the zoological and entomological reference collections needed for basic teaching; microscopes, typewriters, and office equipment were at a premium throughout the College.

Because of these conditions one of the first jobs of the visiting professors was to help the Los Baños staff in the ordering of needed equipment so that the research, in particular, could begin as soon as possible.

### *Arrival of the First Team and Life at Los Baños*

Dean Leland Call was first choice for Project Leader of the initial Cornell team at Los Baños, but when the MSA offered the opportunity to return to the Manila Operations Mission in 1952, all parties involved felt that he could perhaps perform a greater service as head of the Research Office of the Division of Agriculture. In that capacity he could serve as the contact officer for the Los Baños project and, being acquainted with both the governmental and institutional sides of the program, facilitate communications and relations between the two.

In the first years of the Contract Dean Call played as significant a role as any member of the Cornell group. In fact, when it appeared that he might be leaving the Mission in 1953, Dean Myers wrote to Dr. D. A. Fitzgerald of the FOA in a letter dated August 11:

“...It is of great importance to us that Dean Call be retained in his present position in order to facilitate our program. I hope...that Dean Call can be induced not only to complete his present tour of duty, but also to return after his vacation for an additional period. In my opinion he is one of the ablest men in the entire foreign service program of the United States, and it would be a catastrophe to lose his experience and judgment when they are so badly needed.”

The man selected as Project Leader was Professor Montgomery Robinson, a member of the administrative staff of the New York State College of Agriculture at Cornell for 30 years. He had been primarily involved with coordinating extension programs and dealing with the interrelationship among research, resident instruction, and extension teaching. In March 1952 he was sent to Los Baños to help finalize the terms of the Contract and to begin making arrangements for the visiting professors and their families that would, hopefully, soon be on their way. His stay lasted until May 23, and he returned to Ithaca with the Contract signed and the effective date set at July 1. Unfortunately all the necessary arrangements could not be made by that date and it was mid-September before most of the initial party reached the Philippines.

## CONDITIONS IN THE PHILIPPINES

At this time the Philippines were still somewhat unstable, and Professor Robinson during his two-month stay attempted to assess the internal political situation. On April 20, 1952, he wrote to friends back in the United States and commented on the state of affairs in the Islands and around Los Baños.

"Government armed forces have cleared up much of the Huk marauding, pillage, and murder. On all roads outside the city and in places within the suburbs [of Manila] are frequent 'check points,' a road block with armed guards.... I have talked to politicians, taxi drivers, college professors, hotel waiters and 'room boys,' Americans and other foreigners, and natives about the Huks. Views differ. Essentially the Huks represent the large numbers of propertyless unemployed. They are hostile to the present government which they feel has given lip service to the need for land reforms, fairer landlord-tenant-relationships, higher taxes on the rich and some form of decent production credit and housing. Some are just plain handits...; widespread poverty, unemployment and underemployment, hunger, disease and ignorance are basic causes. There is more popular sympathy with the Huks than the government admits. The violence is being brought under control but correction of the fundamental problems moves more slowly."

After his return to the United States Professor Robinson addressed another letter to Professor H. H. Love, the Cornell plant breeder who had been involved in the Cornell-Nanking program and was at that time serving as an adviser in Thailand. Professor Love had been invited to join the Cornell team at Los Baños. Dated June 14, 1952, the letter in part read:

"You ask about attitudes in the Philippines. I have little hesitation in saying that I found no 'antagonism.' There is here and there an indication, not too surprising, that our dollars are somewhat more welcome than our supervision of the expenditure of those dollars. One man on campus at Los Baños indicated the viewpoint that it might be unwise for the Los Baños staff to show much enthusiasm for bringing to Los Baños American scientists, since it might be interpreted as a confession of weakness or incompetence of the local staff and impair relationships with the appropriate bodies. That feeling, however, was not general and I feel very sure that on the part of the majority of the Los Baños staff including the Dean our arrival will be hailed with enthusiasm. Cornell enjoys a most excellent reputation in the Philippines and we are assured of a real welcome."

## FIRST TEAM ARRIVES

The first Visiting Professors, Montgomery Robinson, H. K. Hayes, A. M. Goodman, and C. A. Bratton along with their families reached Manila in August and September. The remainder of September was

spent in Manila working out of MSA headquarters since the houses being built for the visiting staff at the College were not yet ready—thanks primarily to heavy rainstorms and typhoons. Finally on October 2 the move to Los Baños was made. Professor G. C. Kent and his family joined the other four members of the group there on October 17.

While the work was just beginning and the visiting professors and their families were becoming acquainted with the College and the people of the Philippines, letters back to the United States revealed how they were adjusting to a largely foreign culture and climate. A week after permanently moving to Los Baños Professor Robinson wrote to Arthur H. Peterson, who was the program administrator at Cornell, describing the weather. He pointed out that nearly every day was a mixture of sunshine and heavy showers with the temperature in the 80's and 90's and constant high humidity. "Probably you are enjoying brilliant fall colors," the letter said. "We are picking bananas in our back yards. Art Bratton who has the house next door has been out burning brush this afternoon. Maybe he is feeling a bit of nostalgia for the smell of burning leaves without realizing it."

Two weeks later, in another letter to Peterson, Professor Robinson said:

"This week we got our introduction to a typhoon. This area was 100 miles or so from the center but that was close enough. The damage has not yet been appraised but it will be heavy. On this campus a number of valuable trees were blown down, experiment station crops badly damaged, telephone and power lines down and our water supply lines so filled with gravel and soil as to completely shut off our supply for about 24 hours. But it was no trouble to catch plenty of rain water! In fact quite a little sifted through the tightly closed windows on the windward side of the house. The rain came horizontally at great force. The Cornell Club of the Philippines had chosen that date for a cocktail party in Manila in our honor. We felt under obligation to go and did, but it was a wild ride into town—water across the highway hub deep part of the way, trees falling, power lines swinging wildly. We learned that natives stayed home and our arrival was a surprise. But we upheld the honor of Cornell and had a nice time."

Professor Kent also kept up a regular correspondence with Ithaca. On November 18 he described how he and his family were adjusting to life at Los Baños:

"Now that the first month is about over, we are enjoying a few minutes at least. . . . When we get one more chest the furniture will all be in and we will be complete. Now if the pathologist of the group would only figure some way to control the molding of leather, clothes, etc., it would be an agreeable time. Of course when we ask the natives they seem to think that we ought to live with the mold, but I gather the women on the project have other ideas. However, the most memorable part of our month here is that so far we have had only very

slight stomach upsets. . . . The kids are settling down to evaporated milk if enough chocolate is with it and they, for some reason, don't seem to miss the green vegetables too much. They are even getting so they will eat the local fruit."

#### LOS BAÑOS AT CHRISTMAS

At Christmas that first year Professor Robinson took time to send a description of the College to friends in the United States:

"The College campus and station grounds are about 45 miles from Manila and about two miles from Los Baños. A narrow paved road, about the length of College Avenue [in Ithaca], lined on either side with faculty homes, small shops and roadside stands leads from four corners on the main through highway to the campus entrance through an arch. . . . Armed guards watch at this narrow gateway which is the one and only vehicular entrance to the grounds of the Colleges of Agriculture and Forestry.

"Largely with U.S. dollars, the institution has been and is being restored; but there remain numerous stark skeletons of former structures. . . .

"New houses built for the Cornell staff are very comfortable and roomy. On the ground floor basement is a servant's room and bath room, garage, laundry and large storage space. About 10 feet above ground level, our living quarters include a screened porch-living room-dining room about 40 feet from front to rear and 15 or 16 feet wide. On one side of this central area are two good sized bedrooms with connecting bath and linen closet; on the other side, in front is another bedroom and bathroom, and in the rear, kitchen, pantry, and a small maid's room or office. Very wide overhanging eaves provide shade and keep out ordinary rains. There are built-in flower boxes on two sides of the master bedroom and across the front porch. . . .

"At night the air is filled with unfamiliar sounds of insects, birds and other creatures. . . . So far we have not satisfactorily identified these voices of the night but they no longer disturb us. . . .

"Every home harbors a few small gray lizards that run across walls and ceilings. They are more effective than Flit in the war against insect invaders and are welcomed in the best of homes.

"Among our minor tribulations on the campus are poor and inadequate light, power and water. Blackouts are of not infrequent occurrence and at best the power fluctuates so widely and drops so low right after dark, which comes around 6 p.m. the year around, that reading at night is often difficult. . . ."

#### IMPORTANCE OF HOUSING

Housing proved to be of vital importance throughout the eight-year period of the Contract. Dean Myers has stated that one of the most valuable contributions of Dean Call to the program was his advice on this subject:

"We did not know enough, at the start, about conditions in the tropics. Leland Call advised us not to send professors with young children to the Philippines at least until they had satisfactory housing—reasonable sanitary conditions and water, modern conveniences around the house, and some air-conditioning.

"It's hard to have a satisfied professor if he has a wife with small children who is severely handicapped in her home work."

It was with this kind of problem in mind that great care was given to the construction of homes for the visiting professors.

In spite of the construction of the new buildings, housing proved inadequate when the program expanded to include as many as ten members of the Cornell group, most of whom had families. To help alleviate the problem two single professors lived with two childless married couples for a time, but fortunately such arrangements were not required for very long. At first furnishings for the homes also proved to be a problem of somewhat lesser importance. In 1954, however, this difficulty was resolved when the FOA refurnished the homes with new or reconditioned living and dining room furniture. For the most part housing was generally satisfactory and few serious complaints were made by either the visiting professors or their wives.

#### ARRIVAL PROCEDURES

By mid-1954, when the first Contract was revised and replaced by a three-year agreement for further technical assistance, procedures for processing arriving families had been fairly well established. Identification cards, which were required of all over 12 years of age, were obtained through the executive officer of the FOA in Manila and necessitated that everyone be fingerprinted. Passports and health records were left with the FOA for safekeeping. Auto licenses and drivers' licenses had to be obtained, and special stickers needed for entry into military areas were also required.

After a good deal of negotiation, visiting families were permitted to use the 13th Air Force Post Exchange at the Port Area of Manila, at Clark Field, and at Camp John Hay in Baguio. In order to use these facilities, which included such concessions as shoe and watch repair shops and tailoring services, it was necessary to have a PX card; a visit to the Provost Marshal's Office in the Port Area was therefore standard procedure.

U.S. visitors working at Los Baños were also given the privilege of purchasing gas for their cars in the military compound in the Port Area and were eligible for membership in the Post's Officers' Club (for an initial fee of \$2.50 and a monthly charge of \$3.00) where the food was cheaper and conditions considered more sanitary than most other places.

A stop was also made at the U.S. Embassy Commissary, which was restricted to American personnel associated in some way with the State Department. For an initial deposit of 3 per cent of the visiting professor's base salary plus an additional \$20.00 per adult and \$10.00 per child a commissary card was issued. This card entitled the holder to purchase cigarettes, liquor, miscellaneous household items, and food—including American food products.

The health unit at the U.S. Embassy compound was also available for advice and treatment of such minor ailments as heat rashes, bites, and colds. Newcomers were supplied with limited amounts of drugs including malarial repressants, iodine tablets, heat-rash lotion, and insect repellent.

Mail services to the United States were available through APO; all other mail went through regular channels of the Philippine postal system.

#### AMERICANS AND FILIPINOS LIVING TOGETHER

One of the most significant arrangements contributing to the success of the Contract program may well have been the fact that the Americans and Filipinos not only worked together but lived together as well. Halsey Knapp noted, for example, that the families of the visiting professors and of the Filipino staff of the College lived in the same areas and that there was a high degree of intermingling:

"The Filipino children in particular mixed with the American children, not just in a formal situation in school, but out of school as well. Up and down the road where I lived you could always see them playing together. Children, of course, adapt very quickly, but this kind of relationship was very helpful for the whole family and therefore for the success of the total project."

This informality applied to visiting professors and counterparts and even to the Dean. Professor Knapp said:

"Dean Uichanco lived two houses down from me on the other side of the road. Very often instead of trying to go to his office to see him about something that had come up at a meeting the previous day in Manila, for example, I'd go down the road and see him at his home right after breakfast. He'd have a cup of coffee there with me and we'd talk. There were very good things about that. I came to know him and he came to know me much better than ever would have been the case had I just arranged for an appointment with him in his office all the time."

Another area that might have caused problems for the families of the Cornell staff was that of elementary and high school education for the children. The Philippines, however, had the most highly developed educational system in the Orient with the highest literacy rate (65 per

cent by the late 1950's) in Asia. The schools at Los Baños in particular were adequate for the needs. Children from the first through sixth grades attended the Makiling Elementary School, a private institution with a tuition of 8 to 10 pesos per month, located on the College of Agriculture campus. The Rural High School (there were no seventh or eighth grades as such) was operated by the College's Department of Agricultural Education. American students were not required to take courses in agriculture or in Tagalog, however. In addition, upper-classmen were sometimes allowed to take some college-level courses.

By the termination of the first Contract in 1954 life at Los Baños for the visiting professors and their families was fairly settled. Solutions had been found to most of the initial problems; wives were generally satisfied with living arrangements; and the visiting professors were able to settle down to their research and teaching in the departments of the U.P. College of Agriculture.

### *Contract Renewals*

In early 1953 John V. Hepler of the Office of Foreign Agricultural Relations, United States Department of Agriculture, stated in a radio interview in the United States:

"The College of Agriculture of the University of the Philippines located at Los Baños... is the outstanding agricultural college in this part of the world. Practically all of the present leaders in the Philippine Department of Agriculture and Natural Resources are graduates of that institution, as are likewise the many teachers of agriculture in the vocational agricultural schools and provincial high schools of the country. Many prominent business men and farmers of the country are graduates or former students of the College. Also the College at Los Baños has drawn students from other countries in Southeast Asia and many officials of the Department of Agriculture from Thailand, Indochina, and other countries study there. There is every evidence of renewed interest in the importance of agriculture in the Philippines and the College of Agriculture will play a mighty important part in the training of agricultural leadership that will be required to carry out an expanded program in agricultural settlement and improvement in that country. And since agriculture and forestry are the principal sources of the Philippine economy this program of the College will play an important part in the future progress of agriculture in the Philippines."

A year later E. N. Holmgreen, director of the Office of Food and Agriculture of the FOA, wrote to Dean Myers about plans for renewing the Cornell-Los Baños Contract. The March 12, 1954, letter said in part: "Our agriculture people and our top mission people are very happy about the Contract, and I have a strong notion that if anyone in

Washington or at Cornell tried to cancel out, there would be hell to pay in the Philippines."

After nearly two years at Los Baños, Cornell had no intention of canceling out. The value of the program had been realized in the United States—as the Hepler statement and the Holmgreen letter show—as well as in the Philippines and Southeast Asia.

#### NEGOTIATIONS FOR RENEWAL

Comparatively few problems arose with the renewal of the Contract in 1954. Negotiations were begun early to set an effective date coinciding with the 1955 fiscal year.

Cornell and the FOA both wanted several changes from the original document; unfortunately they were not generally the same changes. In a letter to General W. E. Riley, deputy director for management of the FOA, Dean Myers presented a list of several problems encountered in the operation of the program that he hoped might be corrected. Included were the following:

1. The danger of restrictive rulings by subordinate FOA officials.
2. Delays in the procurement of necessary research and teaching equipment due to "cumbersome requirements."
3. The need for research professors and research assistants.
4. Difficulties with the financing of participant training in the United States.
5. The need for health and accident insurance for Contract personnel and their families.

The FOA in turn recommended two major changes in the Contract. First, they suggested that a maximum of one year should be allowed for overseas study by members of the Los Baños staff under the project. Dean Myers opposed this suggestion on the grounds that any such training should be flexible enough to meet the needs of the individuals and that it frequently took longer to obtain a graduate Master's degree. The second suggestion was that a two-year minimum should be set for personnel visiting Los Baños under the Contract. Dean Myers vehemently objected to this because it "would seriously limit the number of good men who can be recruited for overseas service." In many cases Cornell as well as other colleges and universities from which they were taking leave simply could not spare top men for that long a period. This time limit, too, should be flexible, Myers suggested.

#### TERMS OF THE SECOND CONTRACT

Dean Myers won most of the arguments. The second Contract, which went into effect on June 28, 1954, continued all services set forth in the original agreement and made the following revisions and additions:

1. Support for the project of \$600,000 for three years with termination on June 24, 1957.



*View of the campus of the U.P. College of Agriculture prior to World War II. Developments during two decades since that time are shown in pictures taken in 1965 (see page 254) and in 1974 (see page 395).*



*Remains of the Soils Building served as a mute reminder of the ravages of World War II on the Los Baños campus.*



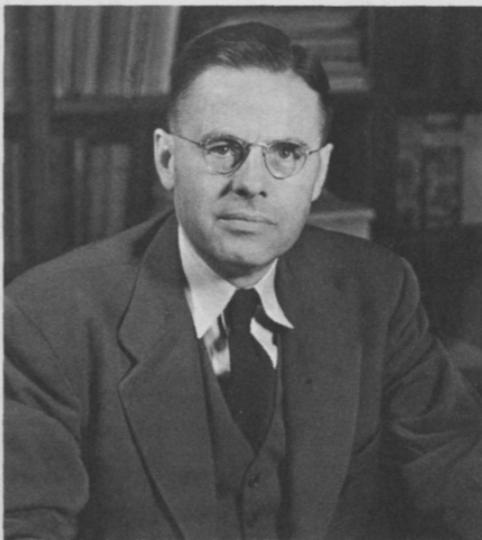
*Symbolic heads of carabaos flank the entrance to the rebuilt College of Agriculture of the University of the Philippines. Thousands of students eager for a college education have passed through this gate.*



*Administration Building as it looked in 1955. (It has been replaced by a new one shown on page 361.)*



*Dr. L. B. Uichanco served as Dean of the U.P. College of Agriculture from 1930 until his retirement in 1959 (with the exception of a period of 18 months during World War II).*



*Dr. W. I. Myers was Dean of the New York State College of Agriculture at Cornell when the Cornell-Los Baños program was initiated and continued as such until his retirement July 1, 1959.*



*The first group of young faculty members from the Philippine College of Agriculture who went to Cornell for advanced training in 1953. Scores have gone to Cornell and other universities for advanced studies since that time.*



*One of the fourteen faculty houses for visiting professors provided by American aid.*



*New library building inaugurated in 1955 provided facilities for the more than 4000 students of the University of the Philippines' College of Agriculture.*

2. An increase in visiting personnel from 10 to a maximum of 14.
3. Assistance for Home Technology.
4. An allocation of \$80,000 for advanced training overseas for Filipino staff members.
5. An allocation of \$40,000 for equipment, supplies, and books.
6. Added emphasis on the various phases of extension and extension training.
7. Added emphasis on the College's role in technical consultation for government and business and the need for demonstration projects, short courses, and in-service training.
8. Aid in planning and conducting special conferences and training programs.
9. Aid in developing facilities to prepare and disseminate training, educational materials and aids, and technical publications.
10. Provisions for health and accident insurance and storage of household furniture for the Cornell staff.

#### THE SECOND RENEWAL

The second renewal in 1957 did not, however, proceed quickly or easily. Although the success of the Los Baños project could not be denied, some doubt about the venture and American technical assistance in general had developed since 1954. Anti-American feelings were not uncommon in the Philippines, particularly in some legislative levels and in the press. There was also considerable resistance in the United States Congress with regard to technical and economic aid to the Philippines and other Far East nations. In December 1956 a planning group of experts of the Senate, led by Dr. John A. Hannah, President of Michigan State University, visited the Islands to assess the situation there as part of an Asian tour.

Meanwhile negotiations for the Contract renewal, which had begun in July 1956, were proceeding. Professor G. W. Trimberger, who was serving as Project Leader of the Cornell group at that time, spent much time with College and University officials, and people in the various government agencies in Manila that were involved in the project. In spite of many problems, it appeared by the beginning of March 1957 that the Contract would be renewed until June 1960 when, it was felt by the Cornell staff and administrators, Los Baños would be able to continue without formal technical assistance. Assistance could be concluded in 15 fields within 10 departments as of July 1957, and plans were made to continue assistance in another six fields and give additional aid to 13 new areas in eight different departments.

On March 14, 1957, Professor Trimberger wrote to Controller Peterson noting that he and Dean Uichanco personally carried the Contract from the Board of Regents and Acting President Virata to the ICA Manila Office to speed up the proceedings. The document was approved there, a letter of transmittal obtained from the NEC, and the

Contract was mailed to Washington on March 11. Controller Peterson meanwhile refused to make any final arrangements for visiting professors to replace those already in Los Baños until the Contract was officially signed by everyone involved on both sides of the Pacific.

The Contract did eventually reach Washington and was approved by the ICA. The Cornell-Los Baños project had been extended to June 1960.

### *Funding of the Los Baños Project*

Certainly in any project as large and comprehensive as the Cornell-Los Baños project in terms of participants, time, and number of governmental organizations and bureaucracies, it could be expected that one of the major problems would be the handling of the millions of dollars used to finance the program. And so it proved to be; in the eight years of the agreement between Cornell and the College of Agriculture no single problem caused as much concern or took as much administrative time.

#### REIMBURSEMENT AND ORDERING PROCEDURES

In the first months such a seemingly simple thing as the filing of proper certificates to obtain reimbursement was a sore point. The authorization process usually followed a maze from the Project Leader at Los Baños to Dean Uichanco to PHILCUSA to MSA, Manila office. From there the papers—which included invoices, suppliers' certificates, statements of estimated cost of services, ocean or airway bills of lading, works progress certificates, Philippine government certification papers, and additional miscellaneous documentation—were returned to Dean Uichanco who gave them to the Project Leader who sent them to Arthur Peterson at Cornell, and he mailed them to MSA in Washington where final authorization was given.

The reimbursement procedures, however, were less complicated and took much less time than did those for ordering supplies from the United States. In this case the staff of a department (including the visiting professor) submitted a list of needed supplies with estimated costs to Dean Uichanco. Dean Uichanco sent the list to PHILCUSA; thence it went to MSA Manila and then on to MSA Washington for "approval and pruning." The return followed the same steps; MSA Washington notified MSA Manila which in turn notified PHILCUSA of approval. PHILCUSA then placed orders for the supplies that had been approved with Philippine importers who sent word to their American agents. The agents called for bids—even if the products involved were available from only one source. Sixty days were allowed for bids to be received. The supplier would be selected from among the bidders and given a firm order. He then set about collecting the goods which in time were sent to Manila. There upon arrival they received

careful inspection before being sent to the University of the Philippines warehouse where finally they would be picked up by a vehicle from the College of Agriculture.

In simplified terms of time, it usually took a year from the original departmental request before the supplies were received!

A letter from Director Peterson to M. B. Craig, Chief of the Technical Assistance Audit Section, Program Audit Branch, of the MSA, dated July 16, 1953, acknowledging the receipt of a reimbursement check for \$16,010.66 illustrates a related problem. "It is always a disappointing event to receive a check for reimbursement," Peterson wrote, "because these checks are always in an amount considerably smaller than the reimbursement which we claim, and always include items which have been disallowed by either your office or PHILCUSA." As a result, Peterson stated, Cornell was forced to use overhead funds to cover these items thus losing money on the venture.

Although eventually arrangements were made to order supplies through the Cornell purchasing department, thus greatly reducing the time factor, problems of reimbursement continued throughout the project. In August 1955 Dean Myers wrote to Richard Humphrey of the Committee on Institutional Projects Abroad of the American Council for Education and expressed his feelings on the subject. "It is highly exasperating," the Dean affirmed, "to be treated like crooks who have been caught up by some clerk in the Controller's office."

#### EARLY COSTS OF THE LOS BAÑOS PROJECT

It is difficult to detail exactly how much money in pesos and dollars was spent under the Cornell-Los Baños Contract, partly because aid was given in so many different forms from both the Philippine and the United States governments. Grants-in-aid and contributions were also received from various sources, and exactly what funds went for what piece of equipment or which books in the library becomes almost irrelevant; what is important is that all of these financial commitments contributed to the rebuilding and development of the College of Agriculture. Indeed, it is pointless to break down funds in any great detail—just as it is futile to try to separate the contributions of the visiting professors from the total work of their departments. It is possible, however, to present a rough indication where the money came from and where it went during the Contract period.

From January 1951 through December 1955, aid from the ECA, the MSA, the FOA and the latest of these foreign aid organizations, the ICA, amounted to \$1,554,650. According to Dean Call, this figure included \$660,671 in commodities; \$52,852 in technical assistance funds; \$90,127 for participant training; and \$751,000 under the Contracts.

Commodity funds were used for building construction, scientific equipment for laboratories, farm machinery, office and classroom supplies, road construction materials, equipment for the power plant, and publications for the library. In addition, some commodities were purchased under the money from the Contracts.

Technical assistance was provided to the College by the Operations Mission beginning in March 1952, although funds were provided for a consultant during three months of 1951.

A total of 22 participants studied abroad before fiscal year 1955 when most funds for this form of training were incorporated under the Contract.

The figure for the Contract included a \$225,000 estimate for expenses from the first Contract, which was terminated at the start of fiscal 1955 when the second Contract began. A total of \$526,000 was appropriated for that Contract.

During the same period support totaled 6,441,805 pesos including 1,698,370 pesos for four years (1951-1952 through 1954-1955) from the University of the Philippines, 2,764,235 pesos from Counterpart, and 1,981,200 pesos from PHILCUSA allotments. These figures do not indicate, however, that a large part of the money from the University of the Philippines was returned by the College in fees and receipts. From 1950-1951 through 1954-1955 2,067,240 pesos was allocated for the College but 1,597,000 pesos was returned, leaving a net appropriation of under 500,000 pesos for the five years.

During the period of aid through 1955, a total of 219,500 pesos was provided through private grants for teaching and research. Included among the donors were the National Rice and Corn Corporation, (100,000 pesos for rice and corn research); the Council on Economic and Cultural Affairs (\$34,000 for funding an additional visiting professor in Agricultural Economics); the Rockefeller Foundation (\$10,000 for books and journals); and Seeds for Democracy (4,200 pesos for seed viability studies).

The quantity of funds from grants, however, took a dramatic upswing in the 1955-1956 fiscal year with a total of 795,320 pesos (including appropriations for long-term studies) allocated to the College. Unfortunately this rise was not matched by the government; funds from public sources were reduced considerably from the previous year. Failure to obtain sufficient regular government support continued to be a problem for the rest of the Contract period.

#### MONEY PROBLEMS GROW

During 1955 Professor Cedric H. Guise, recently retired, was employed by Cornell University to serve as part-time coordinator for the Los Baños Contract project. By this time Arthur Peterson was beginn

ning to feel that the volume of work associated with the Program added to his regular duties as Cornell Controller, was too great to handle. In addition, it was felt in Ithaca that Contract problems had been reduced to an extent where some responsibilities for everyday arrangements and what had largely become routine paperwork could be given to someone else.

This routine work included a variety of jobs such as completing reimbursement forms, coordinating travel arrangements to and from the Philippines, and facilitating the ordering of everything from typewriter ribbons to electrical equipment to stopcocks. Professor Guise also handled assorted income and import tax problems for the visiting professors. Medical insurance premiums provided additional paperwork and innumerable letters back and forth to Los Baños. Many of the tasks he performed could not really be considered "duties;" for example, he helped a professor get a faulty camera replaced and served as the distributor of Christmas cards for the absent families.

Of growing concern as the Contract period reached and passed the half-way point was the failure of the College to receive enough regular financial support from either the Philippine government or the University of the Philippines. Problems with the latter in particular stood out, and there was apprehension both in Los Baños and in Ithaca about what would happen when American assistance—and therefore Counterpart funds as well came to an end in 1960.

Although allocations from the University of the Philippines were far from extravagant to begin with, much of what was allocated was returned to the University by the College each year. All income to the College was incorporated into the general funds of the entire University. One of the most extreme examples of what this meant occurred in 1954-1955 when the University appropriated 525,837 pesos to Los Baños but the income of the College amounted to 585,580 pesos. In other words, the College of Agriculture returned to the University 59,743 pesos more than it received. Professors Robinson and Cline commented on these financial arrangements in the Third Annual Report of the Contract in 1955. They said:

"This practice not only deprived the College of needed support but also left the College without a revolving fund to supplement regular appropriations, meet emergencies, and allow for unforeseen needs during the fiscal year. The need for such a revolving fund was particularly acute due to the fact that regular appropriations were released by quarters and were commonly released late, leaving the College without expendable funds in approved budget categories for extended periods. Considerable sums in categories like salaries and wages were lost because of this accounting system, although the items were approved in the budget and were badly needed by the institution."

The situation grew no better in succeeding years as money from public funds decreased while enrollment and costs to the College in general were increasing. The slack was somewhat taken up by increases in grants and then in 1958 by the introduction of tuition. This charge added 50 to 60 pesos a semester to the usual fees of 109 pesos for the first semester and 87.50 pesos for all other semesters at the College. Exemptions were based on need and scholarship.

#### AID FROM INDUSTRY AND FOUNDATIONS

Support by foundations and industry contributed greatly to the success of the Cornell-Los Baños project; and during the eight years of the program there was not one area of work at the College of Agriculture that did not receive some support in the form of grants-in-aid. (Most of the substantial contributions are described in the departmental reports.) The growth of these grants coincided with the rebuilding of the College through the Contract and with increasing awareness of the College's position as a center for education and research. In 1953-1954 15,000 pesos in support was given; for 1959-1960 the total was 338,845 pesos—not counting a \$230,000 three-year contribution from the Rockefeller Foundation for scientific, technical, and service equipment. Indeed, special note must be given to the Rockefeller Foundation and the Council on Economic and Cultural Affairs (CECA). Both organizations provided considerable sums over the period of the Contract and extending beyond into the 1960's.

Cornell and the CECA were indirectly related from that organization's inception in late 1953. Dean William I. Myers and John D. Rockefeller III traveled to the Far East early that year to survey the needs of various nations, particularly with regard to agricultural economics. Upon his return Mr. Rockefeller funded the CECA (later renamed the Agricultural Development Council), which was incorporated on November 23 under the New York State Membership Corporation Law. The purposes of the new corporation were charitable, scientific, and educational and were designed to stimulate and support economic and cultural activities in Asia, from Japan through Pakistan. One of the first grants from the CECA went to Los Baños. Additional contributions went for library books, equipment for Agricultural Economics, fellowships for overseas study for staff members, and the financing or partial financing of four visiting professors in Agricultural Economics, Community Development, and Local Government.

Grants-in-aid from the Rockefeller Foundation were numerous and substantial. During the 1955-1956 year alone 340,000 pesos was appropriated; 20,000 pesos to the library, 80,000 pesos to resident instruction, and 240,000 pesos for financing twenty Indonesian students' studies over a four-year period. In all \$10,000 was given to the

library during the Contract while several hundred thousand dollars went for equipment. Overseas fellowship support was also provided and the International House, a center for Filipinos and visiting foreign students, was constructed on the Los Baños campus at a cost of 660,000 pesos. The Rockefeller and Ford Foundations together also financed the International Rice Research Institute (IRRI).

#### TOTAL CONTRACT EXPENSES

At the conclusion of the third and final Contract in June 1960, over \$2,350,000 had been contributed to the College of Agriculture by the ICA and its predecessors. The breakdown of this figure included \$79,000 for technicians, \$148,000 for participant training not covered under the Cornell Contract, \$803,000 for commodities, and about \$1.35 million for the Cornell Contract (See Table 1).

TABLE 1. Expenditures under the Cornell Contract 1952-1960

Expended July 1, 1952 to June 24, 1954; the initial Contract	\$ 178,821.86
Expended June 24, 1954 to September 23, 1960	
Salaries.....	\$ 781,305.38
Transportation—Staff.....	64,027.67
Transportation—Local.....	1,509.22
Storage.....	5,466.22
Trainees.....	149,869.10
Out-of-Pocket.....	24,614.69
Equipment.....	73,404.88
Overhead.....	69,171.54
Subtotal	\$1,169,368.70
Total	\$1,348,190.56

The Philippine government contributed the peso equivalent of \$5,205,000 in rehabilitation funds, PHILCUSA grants, and Counterpart funds.

The outlook for the future in 1960 was not as dark as in previous years. Budgeting procedures of the University of the Philippines had been improved and revolving funds had been established. The Animal Husbandry and Agronomy Departments had been given permission to retain income from the sale of products up to 50,000 pesos and 4,000 pesos respectively. The total appropriation to the College from public funds for 1959-1960 amounted to 2,379,362 pesos—an increase of 395,572 pesos since 1956-1957. Problems, including poor salaries, still remained, and in the Final Report the visiting professors expressed some pessimism over the future viability of the College unless the basic problems were solved. None, however, underestimated the value of the financial aid that had been received during the eight years.



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## CHAPTER III

# The Program in Operation: Departmental Accomplishments

### *Agricultural Engineering*

The original Contract between Cornell and Los Baños called for a specialist in Agricultural Engineering. Professor A. M. Goodman of Cornell was selected to fill that spot and arrived in the Philippines on September 17, 1952, for a stay of almost two years.

#### TEACHING IN THE DEPARTMENT

The Department of Agricultural Engineering, established at Los Baños in 1912, was responsible for teaching all courses in mathematics and physics for the College in addition to courses in irrigation, drainage, surveying, and other farm-related areas. Because of the extremely heavy teaching load and because he felt that Professor Alejandro B. Catambay, Head of the Department, was better equipped to concentrate on research, Professor Goodman spent the majority of his time in resident instruction and improving the teaching program. During the first year he taught courses in irrigation and drainage not only for students specializing in Agricultural Engineering but also for all who were required to take a general course in the field. He also gave a course in plane surveying. Laboratories, although usually concentrating on surveying because of lack of equipment, were included in all three courses. Professor Goodman also contributed to changes in the structure of the Department's courses. In addition, he participated in several off-campus activities ranging from inspecting government rice and *palay* storages on behalf of MSA Manila to investigating well, irrigation, and pumping projects throughout the Philippines.

In Professor Goodman's second year at Los Baños he continued teaching three courses, largely because of greatly increased enrollment and the resignation of an experienced laboratory assistant. Of major importance to the success of the Department's extensive teaching duties were the acquisition of additional surveying equipment and texts on drainage, irrigation, and surveying.

Although only limited research was undertaken by Professor Goodman, his work in surveying the campus grounds, planning a drainage system for the Central Experiment Station lands, and drilling test wells to improve the water supply were vital to the entire College.

#### ENGINEERING RESEARCH EXPANDS

The second of the four visiting professors in Agricultural Engineering, Professor Paul R. Hoff, began work at Los Baños in August 1954. The transfer of Professor A. P. Aglibut to the Central Experiment Station staff near the end of the year made an extensive research program possible, and studies were conducted in rice, corn, and tobacco irrigation; the usefulness of tile, bamboo pipes, and bamboo blind drains for underdrainage; crop production with mechanized field equipment; the size and shape of experimental plots; and the pumping installation of the Irrigation Service Unit. Professor Hoff was also involved with the construction of the open-ditch drainage system designed by Professor Goodman for the Central Experiment Station. Completed for 15,000 pesos which was 6,000 pesos below the original estimate (thanks to free use of Philippine Army machinery and efficient use of excavating equipment), the project involved 28 hectares of farm land.

Of significance for future work in the Department was the signing of cooperative agreements with government agencies interested in research on pump irrigation and irrigation of rice. The Irrigation Service Unit of the Bureau of Public Works and Communications, the Bureau of Soil Conservation, the Bureau of Agricultural Extension (BAE), and the Fertilizer Administration joined with the College of Agriculture in signing a memorandum of agreement covering specific research in pump irrigation. A memorandum of understanding was also signed by the College and the Bureau of Plant Industry (BPI) for the rice irrigation project.

A new program was added to the College's curriculum. In addition to the four-year major in Agricultural Engineering leading to a B.S. in Agriculture, the University Council approved a five-year course in which students would spend the first four in the College of Engineering and the last in the College of Agriculture. These students would then graduate with a B.S. in Agricultural Engineering.

#### ADMINISTRATIVE CHANGES

A main source of problems for the Department, Professor Hoff reported, was the relationship between teaching and research activities and service duties.

"The head of the department is administratively responsible for the operation of the Service Division including the motor pool, and

the field operations of the Central Experiment Station including the assignment of tractors and farm machinery and a portion of the laborers working on the Experiment Station farm. He is also administratively responsible for the care and maintenance of the buildings and campus grounds, including the electric power plant and the water supply system."

Finding these responsibilities detracting from the main teaching and research functions of the Department of Agricultural Engineering, Professor Hoff strongly recommended that the Service Division and the farm operations be completely separated from the Department. His suggestions were accepted and action was taken by the College administration. As a result more time could be devoted to the educational and research aspects of the Department. In addition, laboratory space previously used for car storage, tractor and machinery repair, and storage of grain from the Experiment Station was reclaimed.

Although the teaching load remained heavy, the research program expanded during the 1955-1956 academic year. Irrigation studies of rice alone had grown to six general areas of concentration—the effects of continuous and discontinuous submergence on the lodging and yield of rice; the effects of continuous submergence as compared to intermittent submergence on growth and yield; the minimum depth of submergence needed for optimum growth and yield; the measurement of evaporation, transpiration, and percolation in rice paddies; the classification of varieties of rice based on water requirements, and the effectiveness of weed control methods in rice.

Additional studies included the following: the mechanical harvesting of corn; the cost of baling rice straw; the performance of tractors using gasoline, kerosene, and diesel fuels; the size and shape of sampling units in estimating rice field yields; and, continued from previous years, the irrigation of corn and tobacco and the advantages of different drainage systems. Under a 350,000 pesos grant from the National Rice and Corn Corporation (NARIC) involving several departments of the College, the Department of Agricultural Engineering also undertook research on the milling, drying, and storage of rice and corn.

Cooperative work involving outside agencies also expanded during this period. Equipment was tested for the Agricultural Credit and Cooperative Financing Administration (ACCFA) and the National Agricultural Resettlement and Rehabilitation Administration (NARRA). A twelve-day course in irrigation and drainage was conducted for personnel from the BAE. Advice on various projects was also exchanged between the Department and other government bureaus including the BPI and the Bureau of Public Works (BPW).

Following his two years as visiting professor, Professor Hoff proposed several recommendations for future technical assistance personnel and for the Department in general. First he suggested that the next visiting professor should have a background suited to improving the teaching within the Department, organizing new courses for the five-year program, and working closely with younger instructors. He also urged that mathematics and physics be established as a separate department, that the present research program be continued, and that consideration should be given to making investigative efforts for outside agencies self-supporting.

The third visiting professor began work at the College in June 1956. Professor Harold E. Gray's activities involved all phases of the Department's program including teaching, research, extension work, and administrative reorganization.

#### THE CONTINUING SALARY AND PROMOTION PROBLEM

Professor Gray soon discovered that a crucial stumbling block to further strengthening of the Department was the problem of staff turnover. During the 1956-1957 academic year a total of nine personnel resigned or transferred and ten new appointments were made. This amounted to a changeover of more than one-third of the staff.

Professor Gray found part of the reason in promotion and salary policies. In the Fifth Annual Report, he wrote:

"One underlying cause of this rapid turnover is the policy on promotions and raises. Cases on record show repeated recommendations for promotions and/or raises with no concrete action being taken. This, coupled with the fact that many of the staff are graduates in engineering, a highly competitive field, has led to the resignation of some of the most promising staff members. A more aggressive policy on promotion and raises is essential to the retention of good men."

An associated reason for the rapid changeover in staff was the heavy teaching load. Many people hired to devote part of their time to research found little time to do so and soon became disillusioned. As his predecessor also had suggested, Professor Gray recommended that a partial answer to this situation could be found in establishing a separate physics and mathematics department.

#### REORGANIZATION OF THE RESEARCH PROGRAM

During the year much time was spent on reorganizing the research program. Work was divided into major areas including farm mechanization, lowland rice irrigation, overhead irrigation, drainage, the drying, milling, and storage of rice and corn, and small tools and equipment development. An overall plan for meeting the needs of Philip-

pine agriculture was drawn up in each area and individual research projects designed to aim for these ends. Professor Gray found that in the areas of concentration where the plan had been fully adopted the program was proving successful. He also noted that most of the research in the Department of Agricultural Engineering was financed by funds from NARIC, ICA, and Technical Assistance. A very little money came from University of the Philippines. Lack of funds was not the problem, he said, but rather the fact that they were temporary funds. If the University did not make a permanent commitment to supporting research, then when outside support stopped so would the research.

While studies from the previous year continued, plans were formulated to develop better small tools and animal-drawn equipment for *barrio* farmers. Financing for the program was obtained the following year in a three-year grant from the Presidential Assistant in Community Development (PACD), including up to 105,000 pesos for the first year. The initial funds of 47,000 pesos for the Small Tools Research and Development project were turned over to the College on March 6, 1958. A survey team assigned to examine the tools then in use, determine the need for additional tools, and collect samples of the best tools for possible use in the program began work the following month.

Professor Gray left Los Baños in November 1957 and was replaced in February 1958 by Professor Orval C. French of Cornell. By the end of his stay twelve months later, Professor French felt the research program in the Department had been firmly established and several improvements made in both equipment and building space. In particular, a large laboratory financed by a 20,000 pesos grant from the NEC for rice and corn drying, milling, and storage research was constructed, as was a research shop laboratory for the Small Tools project.

Many of the problems of the Department of Agricultural Engineering remained unsolved when the last visiting professor returned to the United States; the continual turnover in personnel had not been halted; Mathematics and Physics were still taught in the Department; the teaching load remained heavy; and greater support for research was needed from the University. But many significant advances and improvements had also been made during the six years of direct technical assistance under the Cornell Contract.

### *Agricultural Botany*

The first visiting professor of Agricultural Botany, Professor S. N. Fertig of Cornell, arrived in the Philippines November 5, 1954. During his first year at Los Baños, Professor Fertig presented a ten-week

series of seminars on principles and methods of weed control, his primary field of interest, and, the following semester, a full course intended primarily for graduate students was given on the same subject. The greater part of his time, however, was spent in organizing and conducting research. The Department offered courses in cytology, plant physiology, morphology, and basic botany and, like most departments at the College of Agriculture, was heavily overburdened with teaching. In addition, Professor Fertig found both laboratory facilities and space inadequate and the staff in need of advanced training.

Research within the department, although cut to a minimum because of the heavy teaching load, concentrated on cytogenetics; propagation of coffee and cacao; nutritional studies with abaca, coconut, rice, coffee, and cacao; and weed control. Assessing the importance of improved weed control Professor Fertig stated in the Third Annual Report:

"Losses caused by weeds in the Philippines represent a very serious problem in increasing crop production and yield. A solution to the problem is paramount if the maximum benefit is to be gained from improved varieties, increased use of fertilizer, insect and disease control, more and better irrigation systems, and even new roads which open up more farm land for settlement.

"Losses caused by weeds are reflected in reduced crop yields, greatly increased costs of production, clogging of irrigation and drainage canals, harboring insect pests and diseases, and lower quality products for home and market."

At that time the usual methods of weed control in the Philippines, Professor Fertig found, involved hand pulling, cutting, and cultivation. As a result the control of weeds amounted to the greatest single production cost for many crops including corn, onions, and sugar cane. He therefore planned his research both to acquaint the department staff with as many herbicides as possible and to determine what chemicals would do the best job of weed control at the least expense, given Philippine tillage and cropping practices.

After one year of experimentation involving a dozen and a half specific research problems, Professor Fertig was able to conclude that "The cost of chemical weeding of lowland rice has been found to be approximately one-fifth that of hand weeding... with the better treatments causing no significant reduction in yield." Once these preliminary results for rice were recorded, other experimental studies were pushed forward, some in cooperation with the BPI and two with private organizations. Although Dr. Fertig left Los Baños in April 1956 and was not replaced until the following year, the research programs he had organized and supervised were carried on by the departmental staff.

Dr. Edward M. Palmquist of the University of Missouri joined the Cornell team for work in Agricultural Botany in August 1957. Although he undertook research related to the effects of seasonal factors on the production of twelve varieties of tomatoes and collaborated on nut grass studies and experiments on the mineral nutrition of coconuts, Professor Palmquist devoted the greater part of his efforts toward improving the teaching. He was able to do this primarily because of the efforts of the staff, particularly Dr. J. M. Capinpin and Dr. J. R. Velasco, who had over thirty research projects in progress.

Recognizing that the greatest need in the undergraduate teaching program of the College was for inexpensive text books written for Philippine students and directed toward Philippine problems, Professor Palmquist devoted much of his time to preparing such materials. He was directly involved in five different projects, contributing to Part I of a syllabus for General Botany lectures with 92 pages of text and 68 illustrations, a chapter on "The Growth and Development of Higher Plants" for an Agronomy Department booklet, "A Synopsis of Photosynthesis," intended for the Agricultural Botany course in plant physiology, a General Botany Laboratory Book, for which he collected and edited six sections written by departmental instructors, and, in conjunction with Professor B. V. Travis, visiting professor in Entomology, the organization of an office for producing stencils for texts and wall charts for classroom teaching.

Professor Palmquist's teaching activities mainly centered in the General Botany course, a required course for all students in the College of Agriculture taught in multiple sections. Dr. Palmquist assisted in the coordination of the different sections by teaching one section attended by instructors in the other sections and by holding a weekly seminar also for the instructors on materials and methods for the course. He was also directly involved in seeing that a new wing was constructed on the main building, increasing laboratory space and facilities, and the remodeling of the lecture hall.

Although Dr. Palmquist left Los Baños early in January 1959, assistance to the Agricultural Botany Department continued. Dr. Margaret H. Stone, wife of Earl L. Stone, Jr., visiting professor of forestry, an experienced botanist, joined the project as Special Professional Lecturer on November 17, 1958, and served in that capacity until the Cornell Contract was terminated.

Dr. Stone, in addition to assisting in the General Botany course, was primarily concerned with the preparation of instructional materials. During her stay 41 large color charts were prepared and plants were preserved and placed in herbarium cabinets, plastic storage boxes, and preserving jars for use in instruction. Fresh plant material was also gathered and microscope slides prepared. During this period

also staff members continued the preparation of laboratory manuals and lecture syllabi begun by Professor Palmquist.

Thus before the Cornell Contract ended, the Agricultural Botany Department had received substantial assistance in teaching and research, and in the acquisition and preparation of teaching aids and instructional materials. Several staff members had received advanced training abroad.

### *Agronomy*

The Department of Agronomy was established in 1910, one year after the College of Agriculture was founded, and the first course to be given was the study of Tropical Crops. By 1929 the Department had expanded to several subject matter divisions including General Farm Crops, Soils, Farm Management, Plant Breeding, Pomology, Vegetable Crops, Fiber and Oil Crops, Sugar Cane, and Landscape and Ornamental Gardening. Agronomy was the largest department in the College of Agriculture in terms of student enrollment, course offerings, staff, land, and buildings. Several of the present departments at the College originated as divisions of Agronomy. Attempts to split the Department into the two departments of Agronomy and Horticulture repeatedly failed.

The Agronomy Department was responsible for much of the College's land holdings, and in 1934 the experiment station land was turned over to the newly-created Farm Management Division as well. As with all other departments of the College, during World War II much of the equipment was lost and the buildings destroyed. When the Cornell Contract went into effect, four divisions—Farm Crops, Plant Breeding, Horticulture, and Industrial Crops—composed the Department. Staff research was minimal due to lack of funds and heavy teaching loads.

#### PLANT BREEDING AND FIELD CROPS

When Professor H. K. Hayes of the University of Minnesota arrived in the Philippines in August 1952, Professor Dioscoro L. Umali, Head of the Plant Breeding Division of the Agronomy Department, was the only teaching member of the staff. Two laborers assisted him. In the fall, however, Dr. Umali fell ill, thus leaving the Division largely to Professor Hayes for the remainder of the 1952-1953 academic year.

#### *Early Informal Cooperation Begins*

Although the greater part of Professor Hayes's time was devoted to the research program of the Division, during the first year of the Cornell project he also taught two courses, Advanced Methods in

Plant Breeding in the fall and Special Topics in Plant Breeding in the spring. Assisting Professor Hayes in the fall course when he visited Taiwan under the auspices of the Joint Commission on Rural Reconstruction (JCRR) was Dr. J. P. Torres, senior plant breeder of BPI and head of the Economic Garden near Los Baños. "This was a natural development," Professor Hayes noted in the First Annual Report, "as considerable emphasis was given in the course for the necessity of cooperative work and wide testing of varieties as a basis of a sound program of breeding, variety testing, seed increase, production, and distribution of the better varieties."

Largely as a result of discussions concerning the values of cooperation, it was decided that a short course on the basic precepts and problems related to rice and corn improvement should be given. Several other visiting professors, Dr. Torres, and officials in the Agricultural Division of MSA and BPI were also involved in drawing up the program. One hundred twelve attended the five-day session at Los Baños, including key individuals from many government agencies and from other agricultural colleges.

Professor Hayes and Dr. Umali both recognized the advisability of advancing the research program of the Division and worked together to bring such advance about. Plans were made to expand the corn-testing project which Dr. Umali had begun in 1949 and the Department as a whole agreed that all varietal trials and breeding experiments should be turned over to Plant Breeding.

### *Corn and Rice Receive Attention*

Research with corn turned out to be the major achievement of the experiment station program in plant breeding during 1952-1953. Approximately 100 varieties planted at six different locations with trials at the College and at Isabela were so successful that several varieties were selected for more detailed testing. These varietal trials were the first of their kind carried out on a cooperative basis by the BPI and the Central Experiment Station.

The work with corn consisted of two different kinds of studies. The first involved the production of selfed and crossed seed from four Philippine varieties. The second consisted of introducing corn obtained through the Rockefeller Foundation from Mexico and Colombia and from the southern United States.

A cooperative rice improvement program was also started and included varietal trials of both upland and lowland rice, observational trials, and the establishment of breeding nurseries of progeny from crosses made in India. Additional work was conducted with soybeans from the Philippines and the United States, and with cotton and tomatoes.

During the following year the three major projects involving corn and rice improvement were expanded and a fourth area of study, "Seed Purification, Multiplication, and Distribution of Corn and Rice," was added. This too was organized in cooperation with BPI and supported by aid from the FOA. Most of the work on the initial three studies was conducted primarily at the College of Agriculture, but the new study for the certification of foundation, registered, and certified seed was organized mainly by the BPI. A Memorandum of Agreement was drawn up and signed by the College, the BPI and the BAE in mid-1954.

Studies were also undertaken to find an answer to the considerable damage to abaca by mosaic. In March 1954 personnel from Plant Breeding attended a conference at the Abaca Research Experiment Station at Davao to discuss breeding abaca resistant to the disease. As a result the College carried out several areas of investigation, including artificial disease infection studies, cytological studies to examine chromosome makeup, and varietal studies. In addition, clonal nurseries of promising material were established at Los Baños. The most promising sources of resistance seemed to be *pacol*, *canton*, and *Musa lolodensis*, plants related to abaca; Dr. Umali and others at the College had already done considerable work with these and with hybridization of abaca.

During the year several personnel were added to the staff and equipment and supplies were improved. Included in the equipment were a crop dryer, a rice mill, a moisture tester, and threshers. Professor Hayes noted that of paramount importance for future work was the improvement of the Central Experiment Station fields, and a surface drainage system and fencing to protect experimental plots headed his list of recommendations.

Dr. James L. Brewbaker of the Brookhaven National Laboratory and a Ph.D. graduate of Cornell joined Professor Hayes at Los Baños in October 1953. Professor Hayes returned to the United States in July 1954 but was replaced two months later by Professor A. M. Brunson of Purdue University. The Division of Plant Breeding continued to have two Contract personnel providing assistance until May 1955 when Dr. Brewbaker left the Philippines.

#### *Rice Breeding Program Is Established*

By the end of the third year under the Cornell Contract, major advances had been made in the rice and corn improvement programs. The rice breeding program had been established as a long-term project involving the following:

1. Collection, screening, and testing of varieties.
2. Purification and multiplication of foundation seed of the best varieties.

3. Distribution of this seed at the barrio level through a seed certification program.
4. Breeding of better varieties through programs of selection and hybridization on a long-term basis.

During the 1954-1955 academic year the cooperative performance trials with the BPI for rice were concluded after two years of testing at eight different locations. Several different varieties had shown substantial improvement in yields over the most commonly grown varieties. A second major step toward enacting the complete rice breeding program was taken in early 1955 with the appointment of a Seed Board by the government.

Dean Leland Call, in his Progress Report to the U.S. Operations Mission in the Philippines, commented on the importance of this venture. He said:

"A Seed Board, consisting of two members each from the College, the BPI, and the BAE has been appointed by the Secretary of Agriculture to recommend varieties of rice and corn for distribution. The Seed Board held its first meeting April 15, 1955, at which time the two-year summaries of performance trials of upland and lowland rice were thoroughly reviewed. From a total of 122 upland varieties tested, 23 were recommended for increase at the Lamac, La Granja, and Aroman stations during the 1955 wet season. This number will probably be reduced somewhat on the basis of a three-year summary when the 1955 results are available. Foundation seed of the varieties finally chosen will be available for distribution in 1956 to selected farmers, agricultural schools, and farms that are equipped to grow certified seed of recommended varieties to farmers. The ACCFA will finance certified growers who are Farmers Cooperative Marketing Association (FaCoMa) members. The fieldmen of the BAE will help in the recommendation and distribution of certified seed at the barrio and individual farm level."

Thirteen varieties of lowland rice were also recommended for multiplication at that April meeting. Among those serving on the Seed Board were Dr. J. P. Torres, Dr. D. L. Umali, Professor A. M. Brunson, and Dean Uichanco as an *ex officio* member.

### *The Significance of Seed Certification*

This cooperative venture was of great significance for the College, for the Cornell project, and for Philippine agriculture. First, an organized program of research undertaken by the staff in plant breeding, as well as other departments of the College, had achieved substantial results quickly, largely due to the cooperation of the government and the BPI in particular. Second, the establishment of the Seed Board further strengthened relations between the several organizations involved in the entire improvement program. Third, Philippine farmers

would soon be able to use in practical ways what the research program had uncovered. Following the seed multiplication, with the improved varieties of rice and, eventually, corn the rural and barrio people would be able to produce more food. Fourth, one of the major goals of the Cornell project, that of establishing a vital extension program to reach the people with research results, had taken a giant step forward. And this had been brought about primarily by the Filipinos themselves with advice and the conduct of a minor percentage of the research from the visiting professors.

Progress was also made with the corn improvement program and here emphasis was placed on the production of hybrids adapted to the Philippines. Twenty-seven of the most promising combinations were selected for further testing in the next year. Although a high demand for hybrid seed existed, seed stocks were extremely low and the techniques needed for production unfamiliar to farmers and provincial experiment station personnel. For these reasons the work with rice moved considerably faster than the corn program.

Also during 1955-1956 the world collection of 2,362 varieties of rice from 49 different countries was received from the United States Department of Agriculture. Observational nurseries were set up at Maligaya and the College to test them.

Work with abaca breeding also continued. It was noted that all *pacol* X abaca crosses remained mosaic free following repeated inoculations, but were sterile, possibly because of the different number of chromosomes in the parents. Dr. Brewbaker spent a good deal of his time working with Dr. Umali on abaca but also found time to present the lectures in the Advanced Plant Breeding course.

Dr. S. C. Salmon of the United States Department of Agriculture arrived in Los Baños in October 1955 to continue the work in Plant Breeding. When Professor Brunson departed in February 1956 he was replaced by Professor Herbert L. Everett of Cornell. Professors Salmon and Everett remained at the College until July 1957 and were the last full-time visiting professors in Plant Breeding.

#### *A Major Research Grant Is Received*

A major event during the 1955-1956 year at Los Baños was receipt of a grant of 350,000 pesos for corn and rice research from the National Rice and Corn Corporation (NARIC). Dr. Umali was named Project Head for the program, which was to cover a five-year period. Departments of the College involved included Agricultural Engineering, Agricultural Chemistry, Entomology, Plant Pathology, Botany, Soils, and Plant Breeding. About 15 per cent of the funds were slated for Plant Breeding to be used to improve rice varieties and develop corn hybrids.

The Certified Seed Program moved forward during the year. Enough registered seed was sold by the BPI to prospective growers of certified seed to plant about 4,400 hectares to 21 varieties of lowland rice and about 2,400 hectares to 15 varieties of upland rice. An early report indicated that 76 cooperators in 24 provinces were growing lowland varieties and 82 cooperators in 37 provinces were growing the upland varieties. Research at the College and the BPI stations continued to test these and other rice varieties. In addition, five double cross corn hybrids were approved for seed multiplication and eventual distribution by the Seed Board.

These advances were especially noteworthy considering the problems encountered. First, rice birds, rats, and other pests destroyed nearly half of the rice variety trials, and the entire lowland rice crop at the College was lost in the 1955 wet season. Second, according to Salmon and Everett, lack of experience and failure to anticipate problems resulted in only about 25 per cent of the potential seed being certified during the year—and then only because the standards were relaxed. High experimental errors ranging up to 100 per cent were obtained for the trials that were harvested. The visiting professors noted, however, that many of these problems were correctable given time and experience. They added that increases in College staff competent to meet the demands of the program and in travel funds so that they could visit the experimental trials would go a long way toward improving the situation.

Both Professor Salmon and Professor Everett, in spite of the problems that arose, expressed great confidence in the entire program. In the Fourth Annual Report they said:

“The technique for the release of approved rice varieties and corn hybrids in commercial quantity is of great importance. The Certified Seed Program, however, has an even broader potentiality. Other seed and planting materials of field crops, horticultural items, and fruit selections may be released through this medium. The result will be a maximum coordination between the cooperating agencies. This, in turn, will guarantee that a maximum number of farmers benefit from the research materials and ideas emanating from the College of Agriculture.”

### *The Teaching Program Proceeds*

Although much of their time was devoted to the research program, nonetheless the teaching program was not neglected by the visiting professors in Plant Breeding. Beginning with academic year 1956-1957, a new graduate course in Principles and Practice of Agronomic Research was instituted to show the interrelationship between the philosophy and history of plant breeding and the modern biometrical

tools employed in research. Prepared by one of the visiting professors, the complete set of lecture notes was mimeographed for student use. Other course additions and planned changes in the curriculum further stressed the importance of moving toward advanced undergraduate and graduate instruction.

In addition to the regular curriculum, special seed schools intended to train BPI and BAE personnel and to improve the field operations of the Certified Seed Program were held at the College with staff in plant breeding playing an important part. A Seed Certification Handbook was produced and included data obtained from research as well as requirements and procedures to be followed in the production of certified rice seed.

Much progress in both teaching and research was also made possible by an increase in staff. The total number of permanent employees was 11 in 1953; but by mid-1957 the total had risen to 42 with 12 at the leadership level.

The Rice Improvement Program continued efforts of previous years with several new areas of examination made possible by the NARIC grant. A stepped-up program of hybridization was organized, and studies of selection for disease resistance undertaken. Experiments dealing with lodging, dormancy, and milling recovery were also conducted.

The Corn Improvement Program also moved forward during the year. Staff members were mainly concerned with maintaining standard inbreds used in approved hybrids and with increasing the quantity of these inbreds for foundation seed. The BPI on the other hand, was responsible for production of parental single crosses, and the BAE supervised the growing of commercial seed of double cross hybrids by the certified seed producers.

In the Fifth Annual Report Everett and Salmon wrote:

"The most urgent need of the current hybrid corn seed project is to step up double cross production. This can best be accomplished through private enterprise. Several seed producer-cooperators have been approved by the Seed Board to establish hybrid corn seed farms. Dynamic working relationships between College, the Bureaus, and private industry promise an efficient and rapid expansion of the hybrid corn industry in the Philippines."

Other specific studies underway that year dealt with corn selection for insect tolerance and disease resistance. Partial success was obtained with inbreds selected for corn borer tolerance and downy mildew and rust resistance. A method of screening plants for herbicide resistance was developed during the year, and research showed the effects of fertilizer on pollen shedding and the merits of reducing plant spacing.

### *Pessimism About Abaca Mosaic*

A great deal of attention was paid to abaca as well as rice and corn. The Cooperative Abaca Improvement Program of the College, BPI, and BAE organized in 1954 was still attempting to find an answer to the mosaic problem. The *pacol*-abaca hybrids that were resistant to mosaic but sterile were the subject of efforts to backcross to abaca. Attempts to find better breeding material were continued, with 56 noncommercial and wild types of abaca—including wild bananas—collected during 1956. An abaca nursery previously abandoned in the College of Forestry was reopened and 32 varieties planted. The Department of Entomology conducted tests with various sprays, but no reaction was obtained for abaca mosaic.

In 1957 researchers tried to select abaca-*pacol* hybrids for fiber quantity and quality, but results fell far below those for abaca. Even if a mosaic-resistant fertile cross was obtained, it would be of little use unless the tensile strength, coarseness, and breaking length were comparable to abaca itself. Inferior quality plants would hurt the abaca industry as much as or more than the mosaic disease itself.

Professors Salmon and Everett estimated that it might be ten years before hybrids with resistance and high-quality fiber would be available for replanting plantations devastated by the disease. Other approaches were taken as well. Abaca seeds were sent to the Brookhaven National Laboratory for irradiation in hopes of inducing valuable mutations. Studies of the relationship of *pacol* and abaca characteristics were completed, as were tests dealing with the relation between biochemical properties of plant sap and resistance.

Professors Salmon and Everett were instrumental in the decision of the staff to prepare annual reports of each research project. These reports assured the compilation of research data and its interpretation, provided easy access to information for interpretation, and made transitions into continuing projects much easier for new personnel. A related project of studying experimental methods used in Philippine research was also begun in 1957.

Major recommendations of Professors Salmon and Everett at the close of their assignments in the Philippines were the following: greater financial support for research was needed from both the College and the government; new crops, including sorghum, should be included in the research program of Plant Breeding; more attention should be paid to the experimental methods used so that errors could be reduced; and a more aggressive policy respecting public relations and extension were needed.

### *Problems with Seed Certification*

Professor R. B. Musgrave of Cornell, the sixth visiting professor in

the Agronomy Department under the Cornell Contract, replaced Professors Salmon and Everett in July 1957. During his year and a half at Los Baños, he divided his time between Field Crops, Farm Management of the Central Experiment Station, and Plant Breeding.

Professor Musgrave's chief function in assisting the Division of Plant Breeding was helping with problems in the Certified Seed Production program. In spite of efforts of the College, the BPI, and the BAE, decreasing amounts of certified seed had been available in the last few years. Although the decline seemed to be leveling off in 1957, the staff in Plant Breeding took measures to reverse the overall trend. The Seed Board granted approval for the College to expand its work with private producers of corn hybrids. An off-season planting was made to increase the supply of inbred seeds. A method for shelling seed corn before drying was developed and thus processing took less time and was more economical. Continuous help was given to farmers growing seed who had specific problems, and research was started for the purpose of comparing methods of native and mechanical hybrid-seed production. Production of rice seed was concentrated among a small number of large producers rather than many small ones in order to facilitate inspection and simplify other problems.

Professor H. A. MacDonald of Cornell began work in January 1959, shortly after Professor Musgrave left Los Baños. His time, too, was divided among Plant Breeding, Farm Management, and Field Crops until the end of the Contract period in June 1960. Summing up the status of the Division of Plant Breeding Professor MacDonald noted that it was well staffed, with several members having obtained advanced degrees during the technical assistance program, and well equipped. The physical plant also appeared to be adequate, given plans for renovation the following year. In conclusion he noted:

"The plant breeding program is aggressive and active and is making rapid progress in rice and corn improvement. It would appear that increased attention and support should be given to the breeding of other much needed crops and less devoted to the nongenetic and agronomic phases of crop production and improvement. It may be expected that this situation will be remedied as the value and importance of other crops is recognized and as other divisions are able to assume their appropriate and full responsibility. This can only come about when a more balanced research organization and support throughout the College is achieved."

#### *Assistance in Field Crops Begins*

Professor Musgrave was the first visiting professor to serve in the Field Crops Division of the Agronomy Department. Although a substantial amount of research, primarily student thesis problems, was already underway in the Division, additional projects were begun and

already existing experiments were intensified during 1957-1958.

Research work with forage crops included a study of seed production of Alabang X grass and the effects of fertilization and management on the process. Plans were made for the Agronomy Department to take over as of the 1958-1959 fiscal year the forage crops program that had involved Animal Husbandry, Soils, and Botany as well as Agronomy. Cooperative trials of grasses, legumes, and management practices were also arranged with the Araneta Grassland Farms. Studies of the effects of stage of cutting on the yield of silage, dry matter, and rootstocks of Napier grass were to begin during the same period.

Silage and breeding tests were conducted with sugar cane in 1958-1959 also. The silage tests served two purposes: first, forage was needed by the Animal Husbandry Department as food for its stock; second, the study was a preliminary test of the feasibility of sugar cane as a silage crop. Sugar cane offered many possible advantages including a high energy content and high yield per hectare, maturation at the beginning of the dry season when silage is most needed, and an easy way of supplying needed protein by supplementing with urea. Breeding tests for sugar cane at this time centered on obtaining disease resistance and greater sugar yield potential.

Tests of peanuts, sorghum, soybeans, and corn were planned to study effects of various tillage methods, and a project to maximize yields of corn and rice was presented to the College's Corn and Rice Improvement Program.

Professor Musgrave also assisted in the Division's teaching program by presenting lectures on hay and silage in the Forage Crops course and by supervising the work of the Department's four master's degree candidates.

### *The Need for More Crops Research*

After twelve months at Los Baños Professor Musgrave urged that the amount and scope of research on farm crops be increased. Before his arrival about the only research actively conducted was sugar cane breeding. In the Sixth Annual Report he stated:

"The Division must regain its leadership in crop production research on rice, corn, sorghum, sugar cane, forage crops, field legumes, root crops, and rotations if its teaching is to remain sound and stimulating. This leadership is badly needed at the College to insure that in the long run there will be an authority on the production of each of these crops. Such authorities will be essential to good public relations, for effective compilation of cooperative research results and their publication as comprehensive extension-type bulletins, and in maintaining the respect of cooperative crops research personnel both in the College and in other schools and agencies."

As with several other departments of the College, one of the major problems in teaching Field Crops was the lack of textbooks and reference materials. The problem extended not only to students in the Division but to junior instructors as well. Professor MacDonald was actively involved in attempts to correct this situation. Source lists of books concerning tropical crops were prepared and a substantial number of publications acquired and ordered. In addition, although he did not teach a formal course, Professor MacDonald presented a series of lectures and seminars dealing with principles of plant research, introduction of new crops, livestock and grassland production in North America, ecology of grasslands, and management of grazing lands.

Professor MacDonald discovered that in spite of the efforts and urgings of his predecessor, support given to the Division for research was entirely inadequate. Only three formal projects involving corn, rice, and sugar cane were being conducted at the time of his arrival in the Philippines. As Professor Musgrave had noted, several other Departments were conducting work that should have been carried out in the Division. This, however, did not hinder Professor MacDonald and staff from planning and moving forward with other projects during 1959. Active research was undertaken in three areas: (a) protein production, (b) supplementary cereals, and (c) field crop culture.

#### *A Solution for Protein Deficiency*

Commenting on the problem of supplying protein for the population, Professor MacDonald said in the Seventh Annual Report:

"The diet of a large segment of the Philippine population is very deficient in protein and vitamins. Protein deficiency is a contributing factor to many maladies resulting in restricted growth and development, illness, and early death. Large quantities of protein-rich food material is imported annually at great cost and reaches only limited segments of the population. It would seem that considering the wide variation in climate, topography, soil, and biotic factors existing in the Philippines much more should be known concerning possible crop production and land use. An acute lack of local information exists in most areas concerned."

Because of this situation, two separate approaches were taken toward increasing the supply of protein. First, studies relating to the production of pasture and forage crops that could support a larger livestock industry—which could then provide more meat and milk products—were started. Second, investigations were begun on growing grain legumes, which are high in protein content, and processing, storing, and transporting them at low cost and with a minimum of industrialization. On a short term basis, Professor MacDonald felt the latter approach would provide the best solution, but that both would be needed in the long run.

Cereal and field crop studies were primarily continuations of work planned and started by Professor Musgrave, in spite of scarcity of funds. In all cases Professor MacDonald served primarily in an advisory capacity with the Filipino staff doing the actual experimentation and field work.

During the last year of the Cornell Contract greater emphasis was given to another area of the responsibilities of the Division of Field Crops. Plant introductions—including nearly 400 samples of wheat, barley, oats, rye, grain legumes, and forage grasses and legumes—were intensified with samples coming from several tropical and sub-tropical countries.

### *Optimistic Trends Are Noted*

Professor MacDonald noted that although research results obtained from field crop projects since assistance began did not warrant firm conclusions, several important trends seemed apparent by June 1960. These were the following:

1. The production of grass as pasture, forage, or fodder need not be a limiting factor in livestock production. Many well-adapted and suitable grasses are available.
2. There are few perennial forage legumes suited to forage production under Philippine climatic conditions.
3. There are serious problems facing the production of grain legumes as an economic field crop. Many of the problems can be overcome with proper selection of the crop and the site on which it is to be grown.
4. The production of wheat of millable and bread-making quality in economic quantity appears to have little promise in the Philippines. Limited but conclusive data should be quickly obtained.
5. Barley, oats, and rye show little promise in the humid tropics.
6. Millet and sorghum show real promise both as feed and food crops.
7. Cover and green manure crops seem to have limited use for the increase of soil fertility but show considerable promise and value for (a) erosion control, (b) supplemental production, and (c) forage.
8. Significant improvements can be made in soil management, tillage, and crop fertilization, leading to a saving of labor and increased crop yields."

Professor MacDonald concluded:

"Further work is needed in all of these lines. There is an acute need for an overall appraisal of research needs followed by the support and activation of a balanced program. It is of little value to fertilize a crop not suited to local conditions; to control insects in a crop which is smothered by weeds; to control disease in a crop that dies for lack of

plant nutrients.... Cooperation and coordination of research at all levels must be improved."

With such in mind he recommended development of a crops products and processing laboratory with the departments concerned cooperating. Further, he recommended the reorganization of Agronomy into two departments: (1) Agronomy and Plant Breeding and (2) Horticulture, and greater coordination of the service units, and the reorganization of the Central Experiment Station under the Dean and Director of Research.

At the end of his stay in the College of Agriculture and the termination of the Cornell Contract, surveying the changes in the Divisions of Plant Breeding and Field Crops of the Agronomy Department over the course of eight years, Professor MacDonald stated:

"The period of service on the Los Baños staff has been short. While some projects were promoted, some started, and others furthered, few were completed. There is much yet to be done. Teaching and research is a never ending process.... We must remember that we build on the shoulders of those who have gone before. May our efforts be a worthy foundation for those who follow."

#### HORTICULTURE AND INDUSTRIAL CROPS

Four visiting professors served in the Division of Horticulture of the Agronomy Department at Los Baños during the course of the Cornell Contract. They were Paul Work, T. L. York, L. H. MacDaniels, and W. C. Kelly, all of Cornell.

Professor Work arrived in the Philippines during the second year of technical assistance, intending to concentrate on vegetable crops. At that time the Division was doing no work on this area, and the only course given was Tropical Vegetable Crops taught by Dr. L. G. Gonzalez. He immediately recognized, however, that training men to carry on the work at a professional level following the completion of technical assistance was of primary importance. So he organized a course in Advanced Vegetable Crops to be given in the 1954-1955 academic year, and assisted in setting up laboratories. His recommendations for the teaching program after that first year included increasing the teaching staff; providing more time for individuals on the staff to read, take graduate courses, and do research; and obtaining visual aids and better laboratory equipment.

The greater part of Professor Work's attention was directed toward research. "Since the research program has started 'pretty close to scratch,'" he said in the Second Annual Report, "present enterprises are elementary and exploratory. Needs for more fundamental work are already evident but it seems best to attack simple matters first in the interest of early results of maximum immediate usefulness."

*Major Studies Begin*

Among the most significant series of experiments begun at that time were variety studies of different vegetable crops from the Philippines, other tropical countries, and the United States. Over 350 samples were planted in exploratory trials with the best to undergo further testing. Several different varieties of lettuce, sweet corn, peppers, beans, and tomatoes that had never before been grown in the Philippines seemed promising by the end of the first year tests. Some varieties of native crops and American imports that were already being grown on a larger scale also did well and warranted further examination.

Other research was conducted on transplantation of vegetables, seed preservation, dry season irrigation, fertilizers, Irish and sweet potatoes, seed viability, and adaptation of vegetables to Philippine conditions and taste. This last area of study was supported partly by Seeds for Democracy, which provided a one-year grant of 4,200 pesos.

Looking toward the future, Professor Work noted that one of the major needs of the Philippine vegetable industry was reduction in the cost of production and labor so that a greater quantity of produce would be within range of the average Filipino's income. Before this could be done, however, in-depth examination of acreage, yields, the use of labor, and marketing systems needed to be made. To grow better crops, special attention needed to be directed toward controlling diseases and insects that attacked various vegetable crops and toward studying the physiology of growth, vegetation, and reproduction of the crops under Philippine conditions.

Professor T. L. York arrived at Los Baños one month before Professor Work left in June 1955. During the second year of Professor Work's stay and the few weeks the two professors were working together, a great deal was accomplished, in spite of the fact that the work in the division was handled by only four research fellows, four part-time student assistants, and seven field laborers.

To begin with, several improvements were made in facilities and equipment. A tool and work shed, a greenhouse, and an airtight storage room were all constructed. A soil sterilization oven was also added. Although these additions were adequate for the current research in vegetable crops, Professor York noted that chemical laboratory facilities and cold storage would be needed for study of physiology, seed storage, and other vital areas of planned experimentation.

Professors Work and York were involved in teaching four courses in vegetable crops and in directing theses, in supervising the two research fellows who handled the majority of the course laboratory sessions. They also advised the four students working toward the master's degree.

Professor York's research program was basically a continuation of that started the previous year. Varietal trials of 30 different plants and over 400 varieties and strains were conducted. Some of these tests were replicated yield trials, in which a series of sweet potatoes showed notable improvements of new varieties over native varieties. As a result of these tests it was decided to stop experiments with Irish potatoes because they proved poorly adapted to the Philippine climate. Research on fertilizers, seed storage and production, and the Seeds for Democracy program were also carried on.

#### *Work in Vegetable Breeding Starts*

Vegetable breeding, a major new area of research, was also instituted by Professors Work and York. Plant selection work with eggplant, sweet pepper, and *sitao* was started. Hybridization tests for disease resistance in tomato and eggplant, sweet pepper, and *pepo* squash were also begun. Okra, lettuce, and snap beans were the subject of inter-varietal hybridization in an attempt to improve adaptability, the assumption being that crossing two fairly well-adapted plants should give some progeny better adapted than either parent.

At the end of the third year of assistance to Vegetable Crops, a summary covering all the variety trials undertaken since 1953 was prepared. Included in those studies were the following: cabbage, eggplant, lettuce, broccoli, garlic, sweet potato, pepper, tomato, melon, watermelon, snap bean, sweet corn, and okra. All of these were evaluated in replicated field trials at the College of Agriculture. Irish potatoes, muskmelons, and watermelons were tested at other locations in the Islands.

The breeding experiments during the 1955-1956 academic year had been expanded from the previous year to include studies of additional plant hybrids and varietal selections. The seed storage work centered on the merits of polyethylene packaging and dehumidification of storage areas in an attempt to maintain seed viability over long periods of time.

The Vegetable Crops Section of Horticulture also received two grants-in-aid in addition to further support from Seeds for Democracy, which appropriated 4,000 pesos for a year beginning April 1955 and agreed to continue the program into 1957. A grant of 1,000 pesos for improving curing and storage of bulb onions over six months was presented by the Central Cooperative Exchange, an organization allied to ACCFA. The third grant-in-aid, 2,000 pesos, was awarded by the SAMAKA Service Center, Inc., for library research work involving large-seeded legumes. This review of literature would then be used in an extension circular from SAMAKA and would be valuable in making recommendations to the College and the BPI as to what pulses would

be possible protein-rich garden crops. Plans were also mapped out for a grant of 100,000 pesos from ACCFA for research on problems of vegetable production.

### *Results from Variety Evaluation*

Before Professor York left Los Baños early in 1957 substantial results had been obtained for several of the research projects undertaken while he was in the Philippines. He stated these general conclusions about the variety evaluation program in the Fifth Annual Report:

1. A high percentage of temperate-region crops were adaptable to the Philippines when grown under appropriate conditions.
2. Many easily adapted foreign plants were not well accepted by the consumer because of fruit shape, lack of esteem, or unfamiliarity.
3. Viny rather than bushy types of snap beans, lima beans, and squash were more desirable because of greater vigor or longer period of growth.
4. Native varieties were generally inferior due to lack of uniformity, low disease tolerance, and low level of productivity.
5. The most promising crops—those that were able to produce seed in the Philippines—included tomato, eggplant, pepper, cucurbits, all legumes, and asexually propagated crops.
6. The greatest needs are improved varieties, increased availability of both foreign and domestic seeds, and increased education of users as to which varieties are good.

Other research programs also contributed important results. The fertilizer trials indicated a high response in all crops to nitrogen in moderate quantities, but minimal response to phosphorus and potassium. Seed storage tests showed that the best solution to increasing seed longevity was the use of desiccants; dehumidification and polyethylene packaging proved less desirable. Seed production tests indicated that the country would most likely not be able to become self-sufficient in biennials but that other crops including eggplant, tomatoes, snap bean, okra, pepper, and sweet corn could conceivably be produced without importing vegetable seeds.

Several important crops showed progress under the breeding program started only 18 months before. Included were tomatoes, squash, *sitao*, sweet pepper, sweet potatoes, and eggplants. Additional tests and hybridization were needed, however, before these improved varieties could be produced by Filipino farmers.

Research funds continued to be made available to the Vegetable Crops Section. The Central Cooperative Exchange, for example, gave the College 14,950 pesos of which 6,900 pesos was slated for Vege-



*Professional cooperation, with sharing and pooling of knowledge and experience, was the key ingredient in the Cornell-Los Baños program. Visiting Professor H. L. Everett, plant breeder, conducted research in plant genetics with Dr. D. L. Umali, young Filipino plant scientist. Dr. Umali later became Dean of the College of Agriculture and Vice-President for Agriculture and Forestry Affairs.*



*Visiting plant pathologist A. G. Newhall (left) and Filipino scientists studied more than 60 strains of coffee from important coffee regions of the world in search for rust resistant varieties. Active cooperation was developed between the College and the Bureau of Plant Industry.*



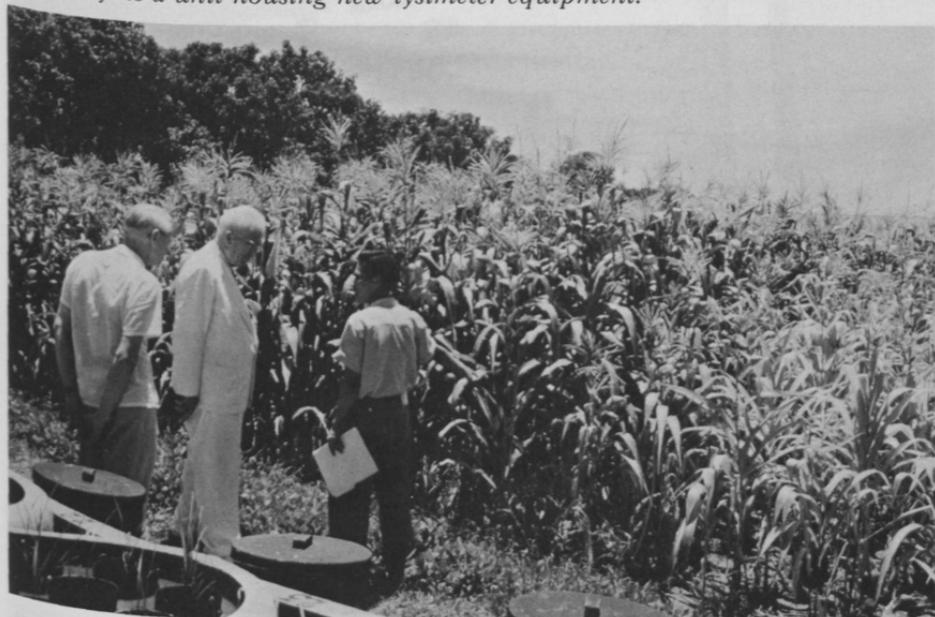
*Greenhouses spring up for the improvement of the College's teaching and research. Young Filipino staff members Leo Orrijudos and Florenda C. Quebral are carrying coffee plants.*



*Coeds from Vietnam study at the College under ICA financial assistance. International dimensions of the UPCA increased greatly during the 1950's with students enrolling from several countries in Southeast Asia.*



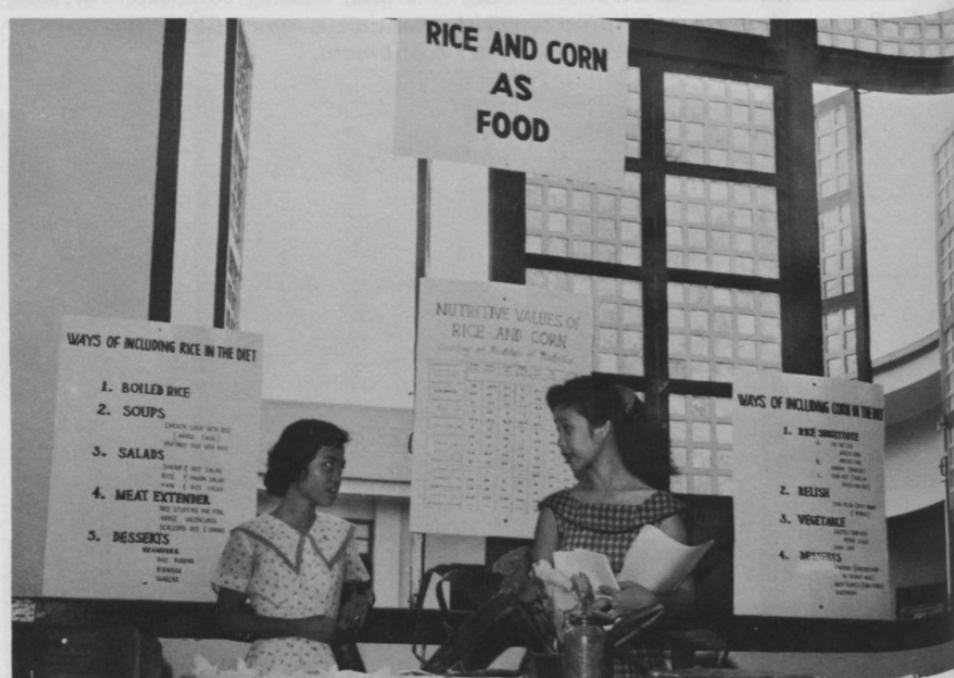
*Research on soils was greatly expanded through assistance under the Cornell -Los Baños contract. Shown here are M. G. Cline, visiting soils scientist, and M. E. Raymundo, young Filipino scientist, examining some of the experiments. At the left is a unit housing new lysimeter equipment.*



*United States Ambassador M. S. Ferguson (center) made frequent visits to Los Baños to observe progress at the College. Igmidio Corpuz and Visiting Professor A. G. Newhall show him some of the College's corn fertilizer experimental plots.*



*New laboratory equipment, such as microscopes, helped these young Filipino students gain the knowledge and experience necessary to solve practical agricultural problems of their country.*



*Home Technology has received attention in the College program for assistance to rural women. This display, demonstrating ways to include rice and corn in Filipino diets, was prepared for field-day visitors at the College of Agriculture.*

table Crops, for studies dealing with onion, garlic, cabbage, and Irish potato problems.

Advances had also been made in the teaching program. In addition to carrying the greater part of instruction in the section's four courses, Professor York was instrumental in the completion of a set of mimeographed laboratory exercises for two of them. Additional mimeographed material was prepared for use with lectures.

### *Pomology and Floriculture Receive Attention*

Following Professor York's departure, nine months passed before the arrival of Professor L. H. MacDaniels, whose duties included assisting in fruit growing and ornamentals as well as, to a lesser extent, work in vegetable crops. Unlike most other visiting professors, MacDaniels did not work with a single counterpart but with one from each of the three sections in the Division of Horticulture—Pomology, Vegetable Crops, and Floriculture. He soon found that one of the bigger problems in all three sections was that written course material was unavailable or nonexistent. Although his predecessors had worked toward correcting this situation in vegetable crops, Professor MacDaniels emphasized that more needed to be done quickly and suggested that additional mimeographed material be prepared in lieu of texts. Work was started on a manuscript on horticulture in the Philippines, and plans were made to prepare outlines for lectures and laboratory work in pomology and ornamentals.

Many research projects in vegetable crops had been fairly well established during Professor York's tenure, and many of the projects started then were continued during the 1957-1958 academic year. Variety evaluations were conducted at Clark Field, where the soil was considerably different from that at Los Baños, as well as at the College. Vegetable breeding was also continued with partial financial support from ICA. In addition, studies were undertaken to determine why crops failed. Results of these tests indicated that for most vegetable crops soil fumigation was essential but that even this did not halt some organisms. In the long run the answer seemed to be the breeding of resistant varieties.

Work in Pomology centered on variety and species introduction to test their adaptability to Philippine conditions. Plans were mapped out with the BPI and ICA for introducing fruits from subtropical horticultural stations in Southeast Asia, South and Central America, Florida, California, and Hawaii. At the same time a cooperative program testing the possibility of growing temperate zone fruits including apples, pears, and plums in the Mountain Province was started with BPI. Seeds had been imported by the end of the year, and scions of 102 apple varieties and 10 pear varieties had already been grafted at

the Baguio Experimental Station. Other experiments included fertilizer trials with pineapples and production studies of Philippine bananas.

Research studies in floriculture also centered in variety evaluations. Seeds of about 50 annual flowering plants most likely to succeed in the Philippine climate and soil were tested for adaptability. Nine varieties of poinsettias from California and eight of bougainvillea from Calcutta were also studied. A project to see if orchid seeds could be germinated in nutrient agar tubes was also under way.

Additional research concerned controlled-mist propagation of fruits and ornamentals and the use of artificial light in controlling plant growth.

Professor MacDaniels was also involved in drawing up a proposal for landscaping the campus of the College, serving on the Graduate School's board of examiners, and acting as official delegate of the American Association for the Advancement of Science to the First Southeast Asia Soil Science Congress in Manila.

### *Philippine Horticultural Needs*

Professor W. C. Kelly joined Professor MacDaniels as visiting professor in the Division of Horticulture on the last day of the year 1958. Although Professor MacDaniels returned to Cornell the following May, Professor Kelly remained in the Philippines until the termination of the Contract period. Before leaving, however, Professor MacDaniels closely examined the state of horticulture in the College and in the Philippines and proposed several recommendations. In his terminal report, he noted:

"The orderly development of the horticultural field has...scarcely begun and the production, processing, transportation, and marketing of horticultural products on a large scale are mostly undeveloped... City markets are not well supplied with good fruits. Prices are very high on many fruits that could be produced in quantity. Far too much of the fruit on sale in Manila is of poor or uncertain quality. There seems to be no fundamental reason why the markets cannot in the long run be supplied with good quality produce. This will require the development of well-managed commercial orchards and these in turn will develop only as good varieties are grown and transportation and marketing facilities improve."

It therefore was the responsibility of the College, he noted, to discover ways of improving native varieties of fruits and vegetables and to discover plants that, once imported, could be perpetuated as food and fiber crops in the Islands. It also fell to the College and the staff in Horticulture to train personnel in the science of testing, growing, and producing these products.

### *Aid in Industrial Crops*

Professor Kelly was assigned to the Division of Industrial Crops. Under this heading were such perennial tree crops as coffee, coconuts, and cacao; perennials including black pepper, vanilla, abaca, ramie, and agave; and annuals such as cotton, tobacco, and jute.

Lack of funds constituted the main reason for this division's failure to develop an adequate research program, but Professor Kelly felt "the main limitation was staff inertia." Coffee and cacao were the only crops supported by outside funds, Professor Kelly reported, and little attention was paid to other crops, except when they could be sold as produce. Extensive work, however, was done with coconuts and the *cadang-cadang* problem. (See below under the Department of Plant Pathology.)

Teaching in the Division met with little more success. Three courses were given, but were of little value, according to Professor Kelly. In the Final Report he said:

"These courses were organized before the war and unfortunately the course outlines escaped destruction. The same outlines are still followed. The information given the students is mostly empirical. The culture of the crops is reduced to a procedure to follow in planting, spacing, fertilizing, etc., so that no basic principles are taught. The procedure is not based on experimental results but on customs, prejudices, and casual observation of farmer practice. Many laboratory periods are consumed in 'busy-work,' using students to weed or harvest products to be sold. This is justified as 'farm practice'—a practice not unique to this division."

While attributing the problems in Industrial Crops primarily to lack of funds and to tension within the staff, Professor Kelly emphasized the progress that had been made in the Sections of Floriculture and Vegetable Crops and the interdepartmental work done with coconuts as hopeful signs of real progress eventually being made in industrial crops as well.

Professor Kelly spent some of his time in the other sections of Horticulture—primarily in a strictly advisory capacity since extensive research programs had been started there beforehand—and was particularly impressed with the research in vegetable crops. He noted, too, that the staff had gone beyond what Professors Work and York had initiated not only in research but in extension. During his stay several leaflets were prepared and published, mimeographed bulletins printed, and vegetable field days held. The teaching program as well had advanced, and Professor Kelly found the courses "extremely well organized and up-to-date," the laboratory sessions well chosen, and the progress toward publishing a standard text for the Philippines encouraging.

## SUMMARY OF ACHIEVEMENTS IN AGRONOMY

Certainly some of the outstanding achievements of the Cornell-Los Baños Program were accomplished in the Department of Agronomy. The growth of the Corn and Rice Improvement Programs and the Certified Seed Program in the Division of Plant Breeding; the growth of cooperative relations between the Department and government agencies—especially the BPI and BAE—and eventually private enterprises as well; the preparation of outlines and texts stressing the accomplishments and problems of Philippine agriculture; the varietal studies and vegetable breeding programs introduced; staff development in all agronomic disciplines—all are achievements indicative of the best accomplishments resulting from the eight years of cooperative relationships in teaching, research, and extension.

Special note should be taken also of the advanced training undertaken during those eight years by staff members of the Department of Agronomy. Three members of the junior staff in Field Crops went abroad: one obtained a Master's degree and one was still overseas at the end of the Contract. Six junior members in Plant Breeding went to the United States: all six received Master's degrees, and one a Ph.D.; three at that time were working toward doctorates; and two were planning to begin study for the Ph.D. in September 1960. In addition, two staff members in Field Crops and four in Plant Breeding were studying for the master's degree at the University of the Philippines at the termination date. This was also true of several persons serving in the Division of Horticulture and Industrial Crops.

In June 1960 much, however, remained to be done in the Agronomy Department. Without exception, for example, the visiting professors agreed that an essential step was the reorganization of the Department into two Departments: 1) a Department of Agronomy consisting of the Divisions of Field Crops and Plant Breeding, and 2) a Department of Horticulture including Pomology, Vegetable Crops, Floriculture, and Landscape Gardening. Professor H. A. MacDonald also suggested that the crops then studied in the Division of Industrial and Perennial Crops be placed in either Agronomy or Horticulture, depending upon the growth form and culture of the plant.

A great deal of work also remained to be done in extension and in organizing the graduate program at Los Baños. Additional sources of income for research needed to be found; considerable research still was needed on some of the major crop problems in the Islands, including *cadang-cadang* of coconuts and abaca mosaic, and although advances had already been made, improvements in equipment and facilities were still needed.

But eight years of technical assistance had laid the foundation for the building in the 1960's under a new Dean, Professor Dioscoro L.

Umali. And such a foundation was, of course, the real aim in Cornell's involvement with the University of the Philippines' College of Agriculture. Only through building self-sufficiency could the work go on and be expanded when the American professors left. No department showed the success of that intention more than the Department of Agronomy.

### *Plant Pathology*

#### CONDITIONS IN 1952

Professor George C. Kent, head of his department at Cornell became the first visiting professor of Plant Pathology at Los Baños in October, 1952. In the First Annual Report of the Cornell Contract he stated that the biggest problem faced by the Department of Plant Pathology in those first days was the lack of necessary equipment:

"The primary problem was and still is that of equipment. Some time was spent the first few months in doing routine isolation, inoculation, transfer, and other tasks in order to become fully acquainted with the equipment available and in order to advise properly on new acquisitions and replacements. A list of equipment and materials needed for the type of research considered essential...was developed. Unfortunately only a very small proportion of this equipment has yet been ordered even though funds were available. As a result the research program cannot be prosecuted as expected based on 9-12 months delivery from time of request."

Professor Kent added that while some equipment had been received, including a binocular stereoscopic microscope, and facilities improved, with the construction of a greenhouse a notable example, the greatest single detriment to the research program was the lack of a constant source of electricity. "Several pieces of good modern apparatus will remain essentially useless until an adequate electric supply is maintained. Proper sterilization of equipment and media is impossible at present."

Professor Kent's teaching activities during the 1952-1953 academic year included conducting a seminar course involving new ideas and research methods in Plant Pathology. On the whole, Professor Kent noted, the teaching program was sound and the major difficulty was that of overburdened instructors.

By the end of the following year the research activities in the Department were well underway. Professor Kent found that one of the outstanding needs in this area was a plant disease survey to establish not only the diseases present in the Philippines but also the kinds and amounts of damage caused and the general geographic distribution. In order to gather this information Professor Kent felt a series of

bulletins detailing symptoms, causes, and descriptions should be prepared and published both as references for farmers and government agriculturists and as an aid in teaching and directing research in the Department. Once this information was available it would be possible to collect data for the survey.

Considerable time was spent on research related to diseases of the Philippines' two most important food crops, rice and corn. Professor Kent reported that a total of 16 different disorders of rice had been identified but that none held any great threat for a large part of the crop. Several, however, were locally destructive, but he added, insects and weeds caused more losses than all the diseases combined in the previous two years. The most damaging rice diseases were those causing root rot, foot rot, stem rot, sheath rot, and rice blast. Research involving these and other diseases was organized at this time.

Professor Kent found that corn diseases were relatively uncommon and that downy mildew was the only destructive one. Work was begun both in Plant Pathology and Plant Breeding toward developing strains resistant to the disease. Several different kinds of rots were also studied, as were leaf spot and leaf blight.

Attention was also directed toward kenaf, tobacco, legume, abaca, and coconut diseases. The testing of various fungicides for a variety of crops was begun, as was an examination of diseases that might be caused by nematodes. Preliminary work on coffee rusts was conducted, too. Included in the list of vegetable diseases Professor Kent felt needed investigation were bottom rot of lettuce, virus diseases of pepper, leaf blight of onion, and bacterial wilt of eggplant and tomatoes. Industrial mycology was also suggested as an area requiring examination by the Department.

#### THE ABACA MOSAIC PROBLEM

Although most of the work on abaca mosaic was conducted by the staff in plant breeding during the course of the Cornell Contract, the Department of Plant Pathology also did considerable research on this devastating disease. In 1953 Professor Kent was asked by FOA officials to examine the Abaca Mosaic Control Program and make recommendations for action. Two conclusions were reached; Dr. Kent wrote:

"First, control of the disease was possible but only if the whole-hearted cooperation of the growers was obtained. It is obvious that (a) the government alone cannot bring the disease under control, and (b) eradication is impossible. Second, the growers, and even the members of the control unit, had not been properly informed about the nature of the disease and the measures necessary for its control."

As a result of Professor Kent's recommendations training schools for inspectors and growers sponsored by the College of Agriculture,

the BPI and BAE and PHILCUSA-MSA were held in September 1953. Plans were also made for wider circulation of information about the disease.

At the end of his tenure in the Philippines Professor Kent offered several suggestions for improving both the teaching and research programs of the Department of Plant Pathology. He felt that a major detriment to both aspects of the program was the lack of relevancy to Philippine agriculture due to the absence of basic research that could be used in textbooks and the fact that many young staff members were unfamiliar with the total agriculture of the Philippines. Only the acquisition of basic knowledge gained through research would solve the problem, and research depended on a well-financed and organized Experiment Station. Although one purpose of the Cornell Contract was to help develop the Central Experiment Station, technical assistance funds would not be a permanent source of money. Part of the answer, Professor Kent said, rested with private industry. In the Second Annual Report he stated:

"It is the belief of the writer that the College of Agriculture could and should take advantage of or even promote financial help from commercial companies in the solution of problems facing Philippine agriculture, at least in the area of plant diseases. While it is true that such relations can be abused, it is equally true that institutions in other countries with experience in such cooperative undertakings have developed adequate safeguards against such abuse. It would seem that in an institution where the Federal funds available for research are definitely limited, the possibility of commercial support should be investigated, the means of safeguarding relations determined, and the support of research increased in this manner."

#### THE SECOND VISITING PROFESSOR ARRIVES

The second visiting professor of Plant Pathology, A. G. Newhall of Cornell, arrived in the Philippines a month before Professor Kent's departure in March, 1954. His teaching activities included a course in modern methods of plant disease control for qualified seniors. In general he found that the quality of instruction in the Department was being adversely affected by increasing enrollments. This was particularly true of the courses in plant diseases and agricultural bacteriology that were required of all students in the College.

During the year the research program increased in scope and efficiency, thanks partly to the arrival of vital equipment including an incubator, a refrigerator, a colorimeter, and a centrifuge. One of the chief accomplishments of Professor Newhall's first year at Los Baños was the development of the coffee and cacao research program. Coffee at one time was one of the Philippines most important commercial crops, but rust completely devastated the export trade. A major goal

of the program therefore was the search for a strain of coffee resistant to the rust disease. Professor Kent had made arrangements during his stay in Los Baños to obtain a collection of Arabica coffee from the Cowgill-Wellman African collection in the United States. By the time Professor Newhall arrived, 600 rooted seedlings were at the College and ready for testing for rust resistance throughout the country. Before the end of the 1954-1955 academic year, over 50 different varieties and strains of coffee had been assembled, making Los Baños one of the leading repositories of coffee germ plasm in the world.

The significance of the coffee work for the College as a whole, however, carried far beyond simply identification of two strains from the Cowgill-Wellman collection that might prove resistant to the rust. Leland E. Call of the U.S. Operations Mission to the Philippines noted in his 1955 report on progress to the ICA that implementation of the coffee and cacao development program opened up "unparalleled opportunities for active cooperation" between the College's various departments and between the College and the BPI. Working together were entomologists, botanists, agronomists, soils technicians, and plant breeders, as well as plant pathologists. The entire project was funded by dollar and PHILCUSA aid amounting to about 43,000 pesos, part of which was used to support six research assistants in six different departments.

Other cooperative research work was also undertaken during the year with the National Onion Growers Association, Central Luzon Agricultural College, Maligaya Rice Experiment Station, Victorias Milling Company, other government organizations, and private growers of coffee, rice, potatoes, cacao, and citrus.

The firmly established research program continued to grow in 1955-1956 and at the same time Professor Newhall became involved in expanding the extension program. In addition, he was partly responsible for obtaining fellowships from various industries and for organizing the first joint College-dealer conference on fungicide, insecticide, and herbicide research work in the Islands.

Recommendations by Professor Newhall at the end of nearly two years with the Department included the following: make texts more easily available for students; hold regular staff meetings; emphasize research related to control methods, field experiments with growers having disease problems, and seed treatments with fungicides and antibiotics; and report research results to the farmers more quickly.

Professor C. S. Reddy, a specialist in cereal pathology from Iowa State, became the third visiting professor in February 1956. Although he considered his main task at Los Baños to be the training of staff for experiment station research, Professor Reddy also made contributions to the testing program. A tropical spray sticker, needed to keep

insecticides and fungicides from being washed from plants by heavy and frequent rainfall, was developed. The natural rubber latex and ammonia mixture resulted in experimental plants retaining 50 per cent of the original spray after six rains while untreated plants showed a retention of only ten per cent. Also, studies completed during the year included tests of resistance to blast in various rice varieties, to leaf spot and seed-borne fungi in rice, to leaf blight and downy mildew in corn, to leaf mold in tomatoes. Research was also done on diseases of ornamental plants. Over 50 research projects were still in progress at the end of the 1956-1957 year.

Professor L. A. Schafer from Nebraska Wesleyan University discovered upon beginning his tenure as the fourth visiting professor in Plant Pathology in March 1958 that a crucial problem in the Department continued to be a lack of space and facilities, especially in the teaching program. He reported:

"Lecture classes of nearly 200 students are currently being crowded into a hall designed to accommodate half that number. Chairs are placed as close together as possible and the overflow students are forced to sit in the windows and doorways and in adjacent laboratories huddled as near to the doorways as possible."

Office, laboratory, and research areas were also overcrowded to such an extent that he added, "The existing overcrowding is seriously affecting the quality of instruction. No amount of improvement in staff training and number can overcome this condition."

Most of the research initiated by earlier visiting professors to the Department of Plant Pathology showed considerable progress by the end of 1958. The attempt to find a solution to the problem of coffee rust instituted during Professor Kent's stay at Los Baños, for example, had resulted in the testing of 216 Arabica coffee accessions with a total of 11 exhibiting resistance to the disease. All selections, however, did not breed true for resistance but did supply an extensive stock for further testing. New additional projects, many to be supported by the government's Rice and Corn Research Program, were mapped out with Professor Schafer's assistance. For the most part they were actively begun in the following year. Professor Schafer assisted in soil fumigation for nematode control, spore trapping to determine at what time and under what conditions the largest number of pathogenic fungus spores are released, and others.

#### SEARCHING FOR A CADANG-CADANG REMEDY

Throughout the Cornell-Los Baños Contract, one of the most intensive efforts on the part of staff in plant pathology concerned *cadang-cadang* disease in coconuts. By 1958 the disease had affected an estimated 50 per cent of the coconuts in the Bicol Region and was spread-

ing to lower Quezon Province and the borders of the main coconut producing area of the Philippines. *Cadang-cadang* consistently perplexed the most expert scientists, including the visiting professors.

As early as 1953 the College expanded its investigations on *cadang-cadang* although only limited work could be done on the disease at the College because of its absence in that area of the Philippines. Professor Kent participated in a week-long study of the Bureau of Plant Industry's research program at Guinobatan, Albay, and helped arrange to conduct a series of laboratory tests dealing mainly with chemical methods of diagnosis at the Central Experiment Station. Dr. G. O. Ocfemia, one of the leading plant pathologists in the Philippines, had proposed as early as 1937 that the disease was most likely caused by a virus, and the research plan drawn up at Guinobatan continued to use that possibility as its starting point.

Professor Kent suggested in 1954 that it might be wise to include a coconut specialist under the Cornell Contract. Further tests had indicated that the cause of *cadang-cadang* was not a fungus, a bacterium, or from insect feeding. Because the nature of the coconut made it impractical to test the virus hypothesis directly, researchers continued trying to eliminate other possibilities. Professor Kent noted that College staff members might best aid the program by providing advice; by performing quick chemical tests, histological studies, and spectrophotographic analyses; by conducting nematode investigations; and by fertilizer studies to look at the possibility that abnormal soil fertility could be the cause.

Then in 1955 Professor Martin Celino discovered a virus capable of being transmitted by coconuts to other plants. That this virus caused the disease, however, was not proven. At that time Professor Newhall was looking at the possibility that the real cause might be a nematode. Samples sent back to the United States for analysis indicated that nematodes might be the answer, but results were inconclusive.

Professor Reddy, commenting in the Fifth Annual Report of the Cornell-Los Baños Contract that "every visiting professor has had an hypothesis for this disease," proposed his own:

"The symptoms of *cadang-cadang* are those of a decline disease. Many things point to root failure. The roots are rotten, the lower leaves appear to die of starvation, the new leaves remain green until all the roots are rotted and all reserve food has been used up....

"One striking observation is that the disease occurs only in areas exposed to severe typhoons and the severity increases in the most exposed locations.... Somewhat similar symptoms have been described from many countries, such as Ceylon, India, and Jamaica, which lie in the paths of severe typhoons or hurricanes."

Professor Reddy proposed that the strain of typhoons might "stretch"

the roots of the coconut trees, thus causing thousands of "wounds" that enable soil pathogens to invade the roots in such great numbers that the tree cannot recover. Nematodes seemed a prime candidate for the invader.

And in the following years, other hypotheses were proposed. Professor B. V. Travis, visiting professor of Entomology in 1958, suggested two other hypotheses. First, if a microorganism caused *cadang-cadang*, it might be an arthropod-borne virus. Second, if the cause was not a virus or other microorganism, the disease might be tissue damage related to arthropods—perhaps mites—that feed off the coconut trees. In that same year Professor Schafer proposed that research on coconuts be developed and coordinated on the national level to attack the problem more efficiently. He also recommended greater emphasis on breeding for resistance to the disease.

Professor L. H. MacDaniels was asked by Dean Uichanco and other members of the Cornell group to draw up an overall plan for research on the coconut. Projects involving cooperative work of several different departments were prepared, including variety testing and breeding, industrial field surveying, and disease analysis. Upon his arrival in November 1958, Professor G. Fred Somers, who was to assist in the coordination of the administration of the Central Experiment Station and the College as a whole, began working on a joint program involving government and industry as well as the College.

In 1959 the *Cadang-Cadang* Research Committee was set up, composed of the Dean of the College of Agriculture, the Director of the Bureau of Plant Industry, and representatives of the National Science Development Board (NSDB), the Department of Agriculture and Natural Resources (DANR), the Philippine Coconut Administration, manufacturers and dессicators, copra exporters, and planters from Luzon, Visayas, and Mindanao.

No money was then appropriated for research at the College, but this did not stop work at Los Baños. Professor W. C. Kelly worked with the coconut research program, which was supported primarily by Contract funds. Then in 1960, as the Cornell-Los Baños Contract program was ending, money was finally obtained for *cadang-cadang* studies. The newly formed *Cadang-Cadang* Research Foundation, Inc., which had been organized by both private and public groups to support various agencies on a contract basis, appropriated a minimum of 90,000 pesos a year for five years to the College.

#### SUCCESS IN FAILURE

Several major accomplishments were brought about during the Contract period. First, government, industry, and the College all realized that the answer to the *cadang-cadang* problem rested in supporting

cooperative efforts without rivalry. Second, by 1960 departments ranging from Plant Pathology to Agricultural Economics were contributing specialized efforts to the coconut program. Thus, while Plant Pathology sought the disease pathogen, Agronomy tried to develop a strain of resistant coconuts, and Agricultural Economics conducted a survey of coconut-producing regions to obtain data on the extent of *cadang-cadang* damage. Third, most of the actual research was conducted by the staff of the departments while the visiting professors offered assistance in mapping out the research program, suggesting possible areas of study, and coordinating interdepartmental efforts. As a result, when the Cornell Contract came to a close the staff of the College of Agriculture was prepared to take full advantage of both public and private research units and funds offered to Los Baños.

### *Soils*

Originally established as a division of the Department of Agronomy, the Department of Soils became an independent unit of the College of Agriculture in 1930. By the end of the Cornell-Los Baños Contract the Department, which before 1953 had never had a staff larger than three, numbered 20, many of whom had earned advanced degrees in the United States as a result of the technical assistance program. Four visiting professors had assisted the Department in establishing solid teaching, research, and extension programs. They were Dr. Nyle C. Brady and Dr. Marlin G. Cline of Cornell, Dr. L. E. Nelson of Mississippi State College, and Dr. E. H. Tyner of the University of Illinois.

#### THE FIRST YEAR OF ASSISTANCE

Visiting professor Brady came to the Philippines in July 1953. Although the Department had moved into a new building shortly before his arrival, Professor Brady reported that plumbing and electrical facilities had not yet been installed and that the shortage of equipment and even basic supplies such as beakers, stoppers, and flasks made research next to impossible. The Department's six staff members were further hindered in research by the number of students that had to be taught.

Substantial progress, however, was made during that first year of assistance. A total of 16 instructors, research personnel, and laborers were added to the staff, thus freeing several people from some teaching duties and enabling them to begin conducting experiments. Research work organized during this period covered three basic areas including the chemical and physical properties of soils, field fertilizer trials, and greenhouse and lysimeter studies.

The first studies involving the characteristics of soils were undertaken because few data were available regarding the concentrations of organic matter and minerals and the acidity and alkalinity of Philippine soils. A total of 374 samples were collected and analyzed.

Twenty-six well-replicated field fertilizer trials were begun by staff of the Soils Department: sixteen involved rice, nine corn, and one coffee. The purpose of the studies was to determine which element or elements in a particular soil were limiting. These field fertility trials run by the Department were the first extensive off-campus tests of their type conducted by the College. The experiments were set up in Laguna, Batangas, and Quezon provinces.

In an attempt to determine the potash content of Philippine soils, two greenhouse experiments were also initiated. Lysimeter tanks were constructed and an experiment to measure leaching losses in rice fields planned.

Cooperative relations were established both with other departments of the College and with government agencies. Three experiments to measure response to fertilization in various hybrids and varieties of corn and rice were initiated with members of the plant breeding staff. In addition, four experiments in forage crop production were drawn up in cooperation with the staff in animal husbandry and the BAI.

During the 1953-1954 academic year a grant was also obtained from Menzi & Co., Philippine representatives for the Mathieson Chemical Corporation, for 3,000 pesos and ten tons of fertilizer for use in corn and rice trials.

Although the majority of his time was spent in research, Professor Brady also was involved in teaching of several courses and in helping to advise the 17 thesis students in the Department. The DANR also requested his advice on projects involving production of abaca, coconut, citrus, forage crops, and corn and rice. During May and June 1954 Professor Brady took over many of the duties of project leader while Professor Montgomery Robinson was on home leave.

#### RESEARCH EXPANDS

Professor M. G. Cline arrived at the campus in November 1954, one month before Professor Brady returned to Cornell. The Department was growing so rapidly that the new soils building was already inadequate for housing all the Department's activities. Part of the basement in the new Library was made into offices, a stockroom, and four combination classroom-laboratories. The former College Co-op building was used as a drying and preparation room as well. Even these hasty additions to Soils were not sufficient and lecture rooms, laboratories, and offices were still overcrowded.

The research program begun the previous year was expanded. Anal-

yses were made on 2,937 soil samples, and the corn and rice fertilizer trials were extended beyond simply examining nitrogen-phosphorus-potassium ratios to include analyzing long-term crop production and soil properties, and studying interaction of fertilizers and other growing factors. Experiments with coffee, citrus, sugar cane, and forages were also undertaken, with the Victorias Milling Company of Negros Occidental cooperating in the cane research. Other new projects included studies of soil morphology and properties of the Central Experiment Station grounds, soil morphology and physical properties in relation to coconut root distribution, phosphorus fixation and release, and chemical composition of crops in relation to fertilization.

Cooperative relations were also advanced. A memorandum of understanding with the BPI, BAE, and BSC and the Fertilizer Administration was signed by the Department of Soils for fertilizer work in outlying areas of the Philippines. The Department also participated in the Cooperative Coffee and Cacao Research and Development project.

Both Cornell professors did little teaching during the year, but they did make recommendations on administrative reorganization. A record-keeping system for filing experimental data was devised, for example. Professor Cline devoted more of his time to administration of the entire Cornell effort as the 1954-1955 academic year drew to a close, and in May he was named project leader to succeed Professor Robinson.

The third visiting professor, Professor L. E. Nelson, began work in August of the same year. New research included studies of soil moisture, nutrient uptake in rice, lodging in rice, and leaf analysis in rice and corn. Part of the funds for these programs was obtained from the National Rice and Corn Corporation grant of 1956. Cooperative relations with private industries including the Albatross Fertilizer Company and the Philippine Packing Corporation further aided research by the soils staff.

Professor Nelson found that one of the chief problems hampering improvement in the Department's teaching program was lack of texts and laboratory exercises that dealt with Philippine farming methods and conditions and urged that this situation be remedied as quickly as possible. He also helped the staff revise the curriculum and was in particular involved in changes in the graduate program. Professor Nelson pointed out several difficulties that stood in the way of improving graduate education. He wrote:

"The graduate program presents several problems...The small number of graduate students...makes it difficult to offer formal courses on the graduate level. The heavy teaching load at the undergraduate level leaves little time for staff members to devote to the graduate program. These problems will merit serious consideration,

not only by the Department but by the College, as it continues to grow and develop as the leading educational institution in agriculture in Southeast Asia."

#### EMPHASIS ON RICE AND CORN

Rice and corn continued to be major objects of research in the Department of Soils although several other crops were added to the testing program during the 1956-1957 academic year at Los Baños. Of greatest concern were kinds and amounts of fertilizers needed in various soils for different crops. Studies involving lime, nitrogen, and sulfur were added to the program. Minimum and maximum concentrations of nitrogen for growing rice were being established, and work with corn seemed to indicate that it might be possible to triple the average yield of corn by using the proper fertilizer. Because of the advanced knowledge about fertilization of these two crops, recommendations were prepared for Philippine farmers. The Department planned to revise these recommendations each year as more information became available and also to add other crops to the lists.

The lysimeter studies were also producing results. Water consumption rates for wet and dry seasons, amount of vital soil nutrients and minerals lost, and the merits of ammonium sulfate as a nitrogen source as compared to urea and ammonia solution were all measured.

Professor Nelson also assisted in a two-day Soils Short Course in which 43 government, commercial, and educational personnel participated. In addition, junior staff members of the Department of Soils were given in-service training to familiarize them with the various soils of the Philippines. Cooperative work with the national government, other College departments, and industry improved as well. The Albatross Company provided a 2,000 pesos grant-in-aid, and materials including fertilizers were received from Chemical Industries of the Philippines and from Getz Brothers. Coffee experiments were conducted in cooperation with the Philippine Packing Corporation and with Hacienda Paraiso. Farmers' fields near the College of Agriculture continued to be employed as experimental sites.

Following Professor Nelson's departure near the end of June 1957, there was a seven-month gap in assistance to the Soils Department. Professor Edward H. Tyner, the fourth and last visiting professor in the Department, arrived in February 1958. One of the main achievements at Los Baños during Tyner's assignment was the expansion of the physical plant of the Department. At a total cost of approximately 200,000 pesos the area of the Soils Building was increased nearly two-fold through addition of a lecture hall, laboratories, and offices. About 90 per cent of the funds came from Philippine sources with 100,000 pesos originating from the Department's share of the 1,000,000 pesos

appropriated to the College for its part in the government-sponsored Rice and Corn Production Program.

Professor James Dayton stated in the Final Report of the Cornell-Los Baños Contract that the expansion of the Soils Department had benefits beyond simply increasing the physical plant. He wrote:

"A secondary benefit of the building program, was the training in planning that the staff underwent. All major work areas were drawn in perspective. Thus ill-conceived and cluttered laboratory arrangements were avoided. The power consumption and voltage requirement of all electrical equipment at each outlet was designated and the electric distribution system designed for maximum loads assuming all electrical equipment was in simultaneous operation. The location of all major equipment items was planned to facilitate the proper location of utilities. Compressed air and bottled gas in the various laboratories come from a central source through a system of mains."

This type of "training" proved as valuable in many respects as the overseas training in research and instruction of the staff during the course of the Contract. In this period also nine staff members studied in the United States with the majority either obtaining a graduate degree or still working toward it at the end of the assistance. By the end of the Contract, twenty members of the Department were involved in the teaching program and an equal number held nonprofessional status.

#### COOPERATIVE WORK IN PALAWAN

Professor Tyner also participated actively in research in soils. Studies involving the timing of nitrogen applications for corn during the wet and dry seasons were begun, as were evapo-transpiration tests of corn during the dry season and phosphorus fractionation experiments. One of the most significant research programs involved cooperative work with the Bureau of Prisons and the Iwahig Penal Colony on the island of Palawan.

The coastal plain area of Palawan south of Puerto Princesa was only sparsely populated, so NARRA had been actively encouraging settlers to relocate there. These efforts, however, had been hindered by rapid deterioration in soil productivity. The staff in soils decided to investigate this increasingly severe problem. Under an informal five-year agreement with the Bureau of Prisons, an experimental field was set up at Inagauan penal sub-colony to study the soil fertility problems of an apparently abandoned plain. The Soils Department supplied fertilizers, seeds, and supervision while the Bureau supplied land, labor, and farm machinery.

Early tests revealed that the soil in the area was extremely acidic and phosphorus was applied as a corrective measure. Although the

project had been activated only three months earlier, the results were so impressive that a field day was held January 27, 1959, for government officials, farmers, and teachers. By June 1960 the prognosis was that a large nearly barren area of Palawan could be made productive by applying phosphorus.

Professor Dayton summarized the results of the more than five years of technical assistance to the Soils Department in this way:

"The Department of Soils is now in a good position to carry on both research and instruction. It has, in addition, numerous off-campus contacts of a combined research and extension nature. The addition to the Soils Building supplies functional and satisfactory quarters. A permanent and well-trained staff is developing. Its older members have served continuously for a number of years and are well established. Many have secured advanced degrees. When those who are now away on graduate fellowships return the Department will be ready to develop a graduate program of its own."

### *Entomology*

Three professors, J. G. Matthyse, B. V. Travis, and R. W. Dean all from Cornell, with the latter a staff member at the New York State Agricultural Experiment Station, Poughkeepsie, N. Y., served at Los Baños as visiting professors in the Department of Entomology during the course of the Cornell-Los Baños Contract. The first of these, Professor Matthyse, arrived in the Philippines in October 1954 and worked at the College for eighteen months.

Although the Entomology Building was one of the few not destroyed during World War II, the Department had lost all of its books, equipment, and zoological and entomological reference collections. Rebuilding the staff and programs had already begun by the time the Cornell Contract was initiated, and 35 research projects were in progress in 1953-1954. Yet much remained still to be accomplished in teaching, reconstruction, and research.

The teaching load in the Department was extremely heavy. Dr. S. M. Cendana, assistant head, was responsible for all but two of the 18 courses offered in entomology and zoology, largely because Dr. G. B. Viado was transferred to the staff of the Central Experiment Station and Dean L. B. Uichanco, head of the Department, was forced to devote nearly all of his time to administrative duties. Professor Matthyse, therefore, spent much time in teaching, including courses in insect physiology and systematic entomology. He also supervised thesis students and conducted a departmental seminar during his first twelve months at Los Baños.

Both teaching and research suffered from lack of proper facilities and equipment. Professor Matthyse noted, for example, that insecti-

cide research could not be conducted in the Entomology Building for fear that insecticide contamination would eliminate other biology and biological control work there. As it was, the staff found it necessary to store the insecticides in the building, even though it was a questionable practice.

Some improvements in equipment and supplies, however, were made during the year. Laboratory chemicals and glassware were received, as were microscopes for teaching bought with FOA funds. Large quantities of insecticides were also made available free of charge by several manufacturers in the United States.

#### INSECT CONTROL AND OTHER RESEARCH

Professor Matthyse spent much time in organizing the Entomology Department's research program with particular emphasis on field research on insect control for major Philippine crops. Experiments were conducted both on Central Experiment Station lands and on cooperating farms. Rice and corn, the nation's two most important food crops, received the greatest attention, but research involving citrus fruits, pineapple, tropical fruits, and cacao was also conducted. In addition, several cooperative efforts were arranged. An onion project involving the BPI, Central Luzon Agricultural College (CLAC), the National Onion Growers Cooperative, and both the Departments of Entomology and Plant Pathology of the College of Agriculture was continued. The Victorias Milling Company established a fellowship to study sugar cane pests including borers and wooly aphids. Experiments were also conducted in cooperation with the Canlubang Sugar Estates of Laguna Province. Although no departmental research on abaca was begun during the year, plans for off-campus experiments were drawn up.

Zoological research included rat ecology and control, the identification and collection of mites, and sparrow and snail control.

Recommendations submitted by Professor Matthyse during this period included increasing the staff and the facilities and, in particular, creating a new staff position of taxonomist. The taxonomist would serve as museum curator as well as taxonomy researcher, coordinator of identification and classification, and systematics teacher. Professor Matthyse also stressed the need for more extensive off-campus research. In the Third Annual Report he wrote:

"Important insect pests vary in different locations, and their reaction to control practices depends on local climatic conditions. Applied entomological research done at Los Baños cannot be effective if the crop is not normally grown in the Los Baños area."

Other recommendations included the reexamination of the curriculum,

more interest in and attention to extension work, and reorganization of insect and zoological collections.

In the following year large-scale field experiments in controlling insects harming major crops continued. Professor R. W. Dean joined Professor Matthyse in March 1956 and took over full duties the following month when Professor Matthyse returned to Cornell. In addition to the work already begun, Professor Dean started experiments related specifically to the control of fruit insects.

The first year's work resulted in recommendations regarding proper kinds and quantities of insecticides for several crops including citrus, cacao, tobacco, and corn. Biological methods of control were also tested. Under a grant from the National Rice and Corn Corporation studies dealing with the control of insects that infest stored rice and corn were begun. Consideration was also given to the examination of solutions to insect-related damage of the economically important Philippine fiber crops, particularly cotton.

#### EXTENSION AND COOPERATIVE WORK

In an attempt to increase extension work, several conferences with various agencies and departments, including the BAE and BPI, the ACCFA, the National Development Corporation, the Philippine Coconut Administration, and ICA, were held. Lectures and laboratory sessions were also given in the Community Development Workers' Training Program to acquaint participants with the identification and control of insect pests.

Professor Dean observed that many recommendations made the previous year still needed action. Emphasis was also placed on the need for senior staff members to prepare illustrated texts citing Philippine conditions and problems in order to improve the overall curriculum. Also needed were facilities for rearing large numbers of insects for more research in biological control.

Of primary importance during the 1956-1957 academic year was the signing of a memorandum of understanding by the Entomology Department and the BPI and BAE for research and control work on plant diseases and pests. Officially approved on January 17, 1957, the agreement provided for the following:

1. Regular meetings of representatives of the College and the BPI and BAE to examine current research and proposed studies to insure that the most important problems were being studied and to prevent duplication;
2. Accessibility of all facilities to staffs of parties involved;
3. Establishment of a committee on control and quarantine;
4. A quarterly newsletter on developments in pest and disease control; and
5. An in-service training program for DANR personnel.

As a result of both these formal and informal cooperative relations with governmental and private groups many significant advances, particularly in the insect control program, were made.

#### PROGRESS IN CHEMICAL CONTROL

Experiments revealed means of controlling such damaging insects as the rice stem borer, corn borers and earworms, potato lady beetles, onion thrips, cabbage worms, citrus rust mite, and aphids and mealy bugs of coffee. In most cases, however, additional experiments were undertaken to examine other possible control measures. Professor Dean noted that research in this area should not rest with chemical control alone. He wrote:

"The cost of a chemical control program, even when an effective one is available, is not justified for crops on which a low return is realized. Also, the habits of some pests make them almost invulnerable to insecticides. For such reasons, natural methods of control warrant investigation. The development of varieties of crop plants having a natural resistance to, or immunity from, insect attack is a possibility which should not be overlooked, especially under Philippine conditions of high cost of chemical controls and inadequate supplies of insecticides and application machinery."

For these reasons development of varieties of crops resistant to corn borer, rice stem borer, and sweet potato weevil was undertaken.

Of great importance to the research program was the construction of a building for testing insecticides on the Central Experiment Station grounds. NARIC funded the building of a laboratory and screen house. A storage area, financed both by NARIC and Technical Assistance sources, and a laboratory spray chamber and a fumigation chamber for the new insecticide-testing laboratory were later completed.

#### EFFORTS IN INSTRUCTION

Although most of Professor Dean's time was spent with research, he offered lectures in advanced entomology. In addition, new courses were added and others were reorganized with greater emphasis on advanced undergraduate and graduate training. Professor Dean considered this area of such great importance that he recommended at the end of his stay at Los Baños that his successor concentrate on instruction rather than research. He also suggested that a better insect reference collection was needed, that an insectary be built, and that the Mayondon limnological station be rehabilitated so that research there could be renewed.

Professor B. V. Travis arrived at Los Baños from Cornell in July 1957 and, as Professor Dean had recommended, concentrated his activities during the following two years on improving the teaching within Entomology. During the 1957-1958 academic year courses in

veterinary entomology and zoological techniques were instituted. A lecture syllabus for the former was completed for student use, and a laboratory syllabus emphasizing Philippine species was started. An illustrated syllabus for the latter course was also prepared, and another in external and internal morphology was later completed. Professor Travis also was involved in writing a booklet entitled "Household Insects, and their Control" for the Office of Presidential Assistant on Community Development (PACD).

During the year work was also begun on a collection of insect photographs for teaching, extension, and publication purposes. Efforts were made to increase the Department's insect collection as well.

Yet in spite of teaching and writing activities, Professor Travis was involved in the planning of light trap studies and *lanzones* bark borer control experiments at the Central Experiment Station. He also designed and produced visual aids for the entomology courses. By the end of Professor Travis' stay a series of 42 by 60 inch charts were prepared, over 300 kodachromes assembled, and several thousand reprints from Cornell obtained.

#### COORDINATION BETWEEN TEACHING AND RESEARCH

Professor Travis' major final recommendations concerned the research work at the Central Experiment Station. He stated that future progress would largely depend on reorganizing the research program and cutting back the number of projects to suit the size and abilities of the staff. He also felt it necessary to coordinate the teaching and research divisions of the Department. These problems were reiterated by Professor James Dayton in the Final Report of the Cornell-Los Baños Contract. While stressing the advances in teaching and research made during the four and a half years of assistance to the Entomology Department, Professor Dayton said:

"Research is almost completely walled-off from all other activities of the department.... There are virtually no communications, no interchange of ideas, no planning together and consequently no understanding. The results can easily be predicted.

"The situation has been well known, representations looking to its amelioration have been made, but the results have been negligible. Students, both undergraduates and graduates, have been the chief victims.

"Research in entomology should become part, a very important part to be sure, but still a part, of a single department under a single head."

#### *Animal Husbandry*

The first visiting professor to assist the Department of Animal Hus-

bandry at the College of Agriculture was J. K. Loosli, Professor of Animal Nutrition at Cornell. When he arrived at Los Baños in July 1953, two professors and seven instructors comprised the staff. The teaching load was extremely heavy. Sometimes enrollment in required courses numbered 800 students, thus necessitating a large number of sections, particularly in courses requiring laboratory work. This plus lack of texts and loss of unpublished data, library books, livestock, and most of the buildings and equipment during World War II had greatly inhibited progress and research by the staff.

#### THE DEPARTMENT IN 1953

Professor Loosli reported the following general conditions:

"Since the War, the main Animal Husbandry building with adjoining judging pavilion, sheds for animals and feed storage, and a new poultry building had been completed. A new swine barn was built and the dairy barn was being remodeled and enlarged with MSA [FOA] funds. Some fences had been replaced but more than two-thirds of the 120 ha. [300 acres] in the Animal Husbandry fields had grown up to jungle during the war. These areas are very hilly and can be cleared only by hand labor, which had not been available. A small area had recently been planted as a forage garden to test introduced grasses and legumes. Two or three limited areas had been planted to Para grass for pasture but most of the pasture lands had not been plowed, fertilized, or otherwise improved for many years. One of the better fields was said to have been fertilized but the crop was very poor, suggesting improper seed varieties or general poor farming methods.

"Starting with two head of cattle after the war the Department had succeeded in accumulating fair numbers of cattle, swine, sheep, goats, horses, and poultry. Practically no selection had yet been possible because of the scarcity of females of all breeds and of good quality males."

In an effort to help the overburdened staff, soon after arrival Professor Loosli began assisting Professor Valente Villegas, head of the Department, in teaching feeds and feeding. The following semester he presented a course on principles of animal nutrition, which was repeated during the summer term. He also gave seminar talks, supervised nine undergraduate thesis projects, and instructed students, technicians, and laborers on the procedures for conducting digestion and feeding experiments, sampling feeds, and preparing samples for analysis.

#### RESEARCH IS ORGANIZED

The research program organized that year encompassed four general areas of study. The first, chemical composition of livestock and poultry

feeds, involved the analysis of approximately 60 different feeds. Samples were gathered by Professors Loosli and Villegas and analyzed in the Central Experiment Station laboratory under the guidance of L. A. Ynalvez. No new data had been available for many of these feeds since 1935.

The second area comprised a study of the digestibility of feeds by various animals. The only previous work in this particular area was conducted by Professor Villegas and associates in 1933 and involved the digestibility of corn silage by the carabao. The studies begun in 1953 involved sheep, goats, cattle, carabao, horses, and pigs and included tests of several different feeds for each.

The feeding value of specific feeds and rations made up the third category. Tests undertaken included a feeding trial to establish whether or not calves could be raised in the Philippines with limited quantities of whole milk; analyses of corn gluten feed, which proved half as expensive and nutritionally comparable to copra meal for sheep and milking cows; and tests in which chicks were fed diets consisting of only feed from plants, varying amounts of copra meal up to 40 per cent of the diet, and the standard chick starter.

Fourth, cooperative forage crop studies were begun. One project involved staff members in Animal Husbandry, Soils, Agricultural Chemistry, and Agronomy in a comparison of several grasses, legumes, and silage crops grown alone and in mixtures, with various fertilizer treatments. A second venture involved staff in Animal Husbandry, Soils, and Agricultural Chemistry working with the staff of the BAI and BSC at five BAI Stock Farms. Comparisons of the yield and composition of grasses and legumes under different fertilizer treatments, and the response of grazing cattle were the objects of these experiments.

Professor Loosli also served as senior member of the Evaluating Committee for Stock Farms, Breeding Stations, and Breeding Centers that was appointed by Secretary Salvador Araneta of the DANR. In this capacity he advised the BAI on improvements in management and feeding practices at the various farms and stations. In addition, he presented several speeches to the BAI and other Philippine livestock organizations.

#### RECOMMENDATIONS FOR IMPROVEMENT

At the end of his tenure at Los Baños Professor Loosli outlined some of the major needs:

1. Modernization of the dairy unit. Equipment for milking cows, pasteurizing, cooling, bottling, and producing ice cream and other dairy products was needed. Greater production of feed for the dairy herd, control of intestinal parasites, improved

- drainage near the dairy facilities, and fencing.
2. A broader livestock breeding program, particularly for swine and beef cattle.
  3. Modern slaughter and cold storage facilities.
  4. Greater use of the advice and counsel of younger staff members in the plans of the Department.

Professor Kenneth L. Turk of Cornell was the second visiting professor in the Department of Animal Husbandry. He arrived at Los Baños in October 1954, two and a half months after the departure of Professor Loosli. By this time the teaching load had increased considerably, and the beginning course, fundamentals of animal husbandry, for example, had an enrollment of 1,628. Yet because so much time was needed for research, Professor Turk taught just two courses, one in dairy husbandry the first semester and the course in livestock feeding the second term, and presented lectures from time to time in other courses.

When Professor Turk arrived, there were 14 research projects in progress. The research studies concerning digestibility of feeds continued under the guidance of Professor Villegas and valuable data were gradually accumulated. The effects of fertilizer on yield and composition of grasses and legumes were also measured.

Tests were also undertaken in several new areas including the effects of rate of planting on yields of grass, chemical weed control in pastures in cooperation with Professor Fertig and other staff in Agricultural Botany, comparisons of the nutritive value of solvent process and expeller process copra meal—the latter being the only process then in use in the Philippines whereas in the United States the solvent process was emphasized for soybeans and cottonseed—for swine and poultry, the feeding value of cane molasses in rations for cattle, carabao, Murrah buffalo, swine, and poultry, and cobalt requirements of cattle. In addition, experiments involving corn gluten feed and grazing-management studies on legume and grass mixtures were also continued.

#### ANIMAL BREEDING RECEIVES ATTENTION

Long-term animal breeding projects were drawn up for improving beef and dairy production, and Professors Manresa and Villegas were to head the program. The milk production phase involved the use of Holstein and Brown Swiss bulls on Red Sindhi and native cows selected for milk quality and quantity. Professor Turk explained:

“The problem here is to combine the milk producing qualities of the European breeds with the heat resistance and general adaptabilities of the native cattle and those imported from India.

“Some first generation animals resulting from the mating of a

Holstein bull with Red Sindhi cows have produced at rates from 10 to 20 times those of their dams and show good heat tolerance. Unfortunately, little is known of the productive capacity of the bulls used in the College herd."

Part of this breeding work with dairy animals was done in cooperation with the BAI at the Alabang Stock Farm. The Department entered into a memorandum of agreement with the BAI and the BAE on this crossbreeding program.

During the year Professor Turk was also concerned with developing firmer relationships between the Department of Animal Husbandry and the commercial feed industries in the Philippines. A feed conference was held at the College in March 1955 to acquaint the feed manufacturers with the work being conducted at the Central Experiment Station. Discussions were also held regarding the possibility of receiving funds from the Philippine Sugar Institute for research on sugar cane by-products as poultry and livestock feed. The Department received a gift of solvent-extracted copra meal for nutrition studies with swine and poultry from Cargill Inc., Minneapolis, Minnesota.

Before the end of Professor Turk's stay the system of keeping milk and fat production records and breeding and health data on the dairy herd was also revised. A trench silo was constructed to provide feed for livestock during the dry season, and a drainage system for the dairy barn area was mapped out.

One recommendation proposed by Professor Turk emphasized the need for improving beef cattle in quality and quantity. During the following year much effort was directed toward this task.

#### START OF A NATIONAL BEEF CATTLE PROGRAM

A considerable amount of work had been done before World War II by the Los Baños staff in developing the Philamin breed of beef cattle from a combination of Hereford, Nellore, and native breeds. The breed was almost completely destroyed during the War and attempts to re-establish it later had met with little success. Partly for this reason a committee to work with representatives from livestock breeders, the BAI, and other branches of the DANR was formed to recommend procedures for a nation-wide beef cattle production program. Professor George W. Trimberger, who replaced Professor Turk in late 1955 as visiting professor in Animal Husbandry, was named chairman of this committee. Professor Trimberger summarized the conclusions and recommendations of the group:

"The Philippines has in its vast areas of grass lands a natural resource of great potential. To utilize this resource to best advantage requires an increase in the number and quality of beef cattle...

which can be accomplished in a few years without interference with other agricultural programs. Beef cattle are primarily dependent on grass pastures. Consequently, lands that are unsuitable for continuous cultivation can be profitably utilized without causing soil erosion or competing with feed for other livestock or with cereal crops that are used for human consumption. Development of the beef cattle industry can materially improve the nutrition of the Philippine people and at the same time reduce the need for importing chilled and frozen beef or cattle for slaughter."

At that time, Professor Trimberger pointed out, cattle in the Philippines numbered only 60 per cent of the prewar total of 1.4 million, and the ratio of cattle population to human population had shrunk to 1:27—half that of prewar days. The demand for beef had raised the price to more than three pesos (\$1.50) per kilo and forced a foreign exchange outlay of nearly nine million pesos annually for chilled, frozen beef, or live cattle. In addition, the quality and dressing percentage of Philippine beef cattle were both low.

The committee recommended four major steps for improving these conditions:

1. The use of Santa Gertrudis beef cattle ( $\frac{5}{8}$  Shorthorn and  $\frac{3}{8}$  Brahman) to upgrade the native cattle population. Professor Trimberger wrote:

"These cattle feel at home here and frequently can be observed to graze under the tropical sun when native cattle and other breeds are in the shade. When Santa Gertrudis are crossed with native cattle, the progeny show tremendous improvement in size, fleshing qualities, and rate and efficiency of growth compared with the native breeds."

2. Expand artificial insemination. It was felt that this was the best means of upgrading the cattle on a wide scale in a short time.

3. Use of high quality sires through natural breeding. This was still necessary in areas that could not be served by artificial insemination. The committee therefore recommended that a large number of Santa Gertrudis bulls be imported for use under unfavorable conditions.

4. The establishment of two breeding herds of carefully selected females. As a source of bulls in the future the committee believed it would be valuable to start herds at a BAI stock farm and at the College.

The committee also suggested that until the supply of beef was adequate, swine, poultry, rabbits, and goats should be increased in quality and quantity to meet the need for protein in the Filipino diet.

Research projects during Professor Trimberger's first year at Los Baños included studies of the most appropriate type of laying houses for poultry under Philippine conditions; heat tolerance research with

Santa Gertrudis cattle continued by J. C. Madamba and A. S. Achacoso on a cooperative basis at an off-campus farm and also undertaken through a memorandum of agreement with the BAI at the Bongabon Stock Farm; antibiotic feeding experiments with calves, swine, and poultry; and artificial insemination experiments with fresh and frozen semen. In addition, the forage experiments, distance of planting tests, molasses feeding, and crossbreeding studies were also continued. In all, 31 research projects were in progress at the end of the 1955-1956 academic year.

#### STAFF AND ADMINISTRATIVE CHANGES

In the three-year period in which technical assistance had been given to the Department of Animal Husbandry, the staff had grown from 9 to 27 including two professors, four assistant professors, eight instructors, seven assistant instructors, and six research assistants working on a full-time basis. The teaching program was also expanding; during 1955-1956 sixteen different courses were offered to a total of 5,232 students. Courses were upgraded and revised by both Professor Turk and Professor Trimberger.

Administration of the Department was also reorganized. Ten divisions—Poultry; Swine; Dairy Cattle; Beef and Draft Cattle; Horses, Sheep, Goats, and Rabbits; Animal Nutrition; Animal Breeding and Artificial Insemination; Meat and Meat Products; Forage and Pasture; and Public Relations and Publications—were set up. In the Fourth Annual Report Professor Trimberger commented, "This arrangement stimulated each member of the staff to contribute to the administration of the Department. It gave the young members of the Department considerably more confidence in their work and made them feel a part of the organization." A committee structure was also set up under Professor Francisco M. Fronda, who succeeded Professor Villegas as head of the Department in November 1955.

During the year a nutritional research laboratory for conducting extensive analytical work was established in the main Animal Husbandry Building with equipment on order. Although the laboratory was set up within a year of Professor Turk's suggestion, other recommendations were not so easily accomplished. One of the major problems in the Department was failure to rehabilitate outlying pastures which were overgrown with trees and weeds. New fencing was also desperately needed. These difficulties were especially acute since sufficient feed was not available for the livestock during the dry season.

A second major problem concerned lack of a revolving fund for income from departmental sales of animals, eggs, meat, and milk. All income reverted to the University of the Philippines although production costs came directly out of appropriations to the College. Both

Professor Turk and Professor Trimberger pointed out that at least 80 per cent of this money should be kept by the Department to provide funds for feed, repairs, minor construction, chemicals, veterinary supplies and help, office supplies, and other everyday needs. Professor Trimberger noted in 1957 that, "Under the current unsatisfactory arrangement, the Department could make the best financial showing in a situation where no livestock were kept and fed."

As of July 1, 1956, Professor Trimberger became Project Leader and therefore was able to spend only a very limited time actively working in the Department. The progress so in evidence in the preceding years, however, continued. Twenty-five hectares of new improved pasture were planted to provide feed for dairy and beef cattle, thus lessening the feed shortage problem. The Animal Nutrition Laboratory began operations in November 1956 and analyzed a total of 1,997 experimental samples before the end of the academic year. The meat products laboratory was renovated and new equipment purchased from Contract and ICA funds. A building housing a slaughterhouse and a large drier for handling feed and forage samples was also finished.

#### ARTIFICIAL INSEMINATION PROGRAM IS INITIATED

Over the period that visiting professors assisted the Department of Animal Husbandry there was perhaps no project of greater long-run value than the artificial insemination program. During Professor Turk's stay equipment for starting an artificial insemination program was obtained and the first preliminary studies on the collection and processing of semen started. The first shipment of frozen semen to the College was made from the New York Artificial Breeder's Cooperative which is located on the Cornell campus. By the middle of 1955 a limited number of cows had been bred artificially. Emphasis, however, was placed on training personnel in the techniques involved. Dairy cattle, beef cattle, carabao, Murrah buffalo, swine, and poultry were all included in the studies.

Under Professor Trimberger and Professor L. S. Castillo of the College an overall plan for implementation of artificial insemination was drawn up during the 1955-1956 academic year. The major objectives of the program included the following:

1. Establishment of a nation-wide livestock improvement program through cooperation of the College with the BAI, the BAE, and the ACCFA.
2. Initiation of a sire-testing program to identify superior germ plasm for artificial insemination.
3. Selection of males for breeding that would provide low cost service to farmers.

4. Establishment of accurate record keeping on performance and results.
5. Preparation and dissemination of educational material on artificial insemination as a tool for livestock improvement.

During that year also definite steps were taken to meet these objectives.

While plans for implementing the A.I. program in the field were being formulated, the College began using the technique in its dairy herd. Calves from both fresh and frozen semen were born during the year, including five calves sired by bulls from the New York Artificial Breeder's Cooperative at Cornell. This involved the shipping of frozen semen farther than had ever before been accomplished.

The objectives of the program continued to be kept in mind during the 1956-1957 year. The BAI assisted the College in the construction of bull sheds and fences and a representative from the Bureau travelled to the United States to purchase bulls and cows of the Santa Gertrudis breed. The bulls were to be used directly for artificial insemination while the females were selected to start a breeding herd that would serve as a future source of bulls. A second small herd was to be established at the College both for breeding and educational purposes.

Sixteen technicians were trained on a cooperative basis at an artificial insemination course given at the College in July 1956. Then in May 1957 approximately 1,000 people from 26 provinces throughout the Philippines attended the Livestock and Poultry Day, the theme being "Better Animals through Artificial Insemination." Professor Trimberger gave the following description:

"Demonstrations on the collection of semen from bulls and boars and the artificial insemination of cows and sows were performed at scheduled times during the day. Extension workers, ranchers, farmers, poultry and hog raisers, teachers, students, veterinarians, scientists, and American ICA advisers were in attendance. Practical farmers and large ranchers formed an integral part of the panel members of the open forum.... Turnover ceremonies of the sub-zero chilling machine from ICA to the College were conducted. The visiting professor outlined the essential steps for a livestock improvement program in the Philippines."

Professor Robert W. Spalding of Cornell, the last visiting professor in the Department of Animal Husbandry, continued the artificial insemination program after his arrival in June 1957. Four men from BAI were assigned to the College and were instrumental in the following year's research. Processing techniques for bovine semen were perfected but no work was done on frozen semen, partly because irregular and interrupted electrical current made it impossible to operate the new sub-zero refrigeration unit and because no walk-in cold

room was available. Various tests, however, were undertaken to find the best means of maintaining sperm motility under Philippine conditions. Progress was restricted to some extent because under prevailing conditions and with techniques then in use semen had to be used within four hours of collection. Even so, with the aid of a jeep lent by the BAE, 90 sows, 18 cows, and one carabao were inseminated during the first six months of 1958. Professor Spalding summed up the situation in the Sixth Annual Report:

“Technical skill and knowledge are available for implementing this program throughout the islands for cattle and carabao just as fast as the farmers demand this service. Unfortunately, this is not true for swine. Little research has been done with swine semen. The problem is more complicated in that it is not sufficient merely to obtain conception; a good-sized litter must also be obtained. . . . Much research must be done in order to extend this service to farmers with confidence.”

#### OTHER WORK CONTINUES

Professor Spalding was also involved in other work of the Department during his 18 months in the Philippines. He taught a course in Animal Breeding for two semesters and presented a Special Topics course during the summer of 1958. Other teaching activities included participation in related Community Development courses, short courses in artificial insemination techniques, a training school and Poultry Improvement Institute, and Livestock and Poultry Day at the College.

This period was marked by declining enrollment, but also by staff resignations; during the 1957-1958 year nine members resigned, some to get more training and others because of low salaries and slow promotions. At the same time departmental facilities continued to improve. A new swine barn was constructed, the Animal Nutrition Laboratory was widened and equipment added, an artificial insemination collection shed was built, drainage was improved and new fences put up, 35 hectares of improved pasture land were added to the Department's holdings, and a new freezer and milking machine were obtained. Professor Spalding evaluated the achievements as follows:

“The research program was continued commensurate with the funds, facilities, and technical personnel available. The visiting professor has not tried to expand or increase the research program because it is necessary first to provide conditions of feeding, management, disease control, and numbers of animals which will provide for uninterrupted experiments and valid conclusions. . . .

“The relatively low number of projects in progress (22), does not reflect a decline in active research as compared to the 51 reported in 1957, but results from the cancellation of projects which were inactive

for various reasons and the writing of new project outlines that are more comprehensive than some of the former ones."

The studies of forages, fertilization, feeding values of grasses and legumes, and animal nutrition were continued.

Upon completing his stay at Los Baños Professor Spalding stated what he felt to be the most pressing needs of the Department and of the Philippine farmers:

"The number one problem of the livestock industry of the Philippines is for information on the simple factors of good husbandry. Most of the research at the present time should not be the basic type but rather on the solutions of relatively simple problems on methods of feeding and management, forage production and utilization, disease and parasite control, and culling and selection in order to get livestock production on a sound and economical basis. . . . Research conducted on a limited budget with limited facilities must be carefully considered in accordance with the needs of the industry with emphasis given to that which will increase food production of the country the fastest."

#### THE FINAL YEAR OF ASSISTANCE

During the final year of the Cornell-Los Baños project the Department showed that it could function on its own. By June 1960 a total of 27 courses were being offered by a staff of 24. Twelve members had received overseas training to improve their teaching and research capabilities during the eight years of the Technical Assistance program. Although most of the older members of the faculty, including Professors Villegas, Fronda, Manresa, and Gonzalez, had retired or passed away, the Cornell professors considered the Department in capable hands under the leadership of Professor A. C. Campos. During this period of rapid growth an incredible volume of work had been accomplished as evidenced by the number—773—of scientific and semi-popular articles published. In addition plans were also being considered for establishing a graduate program in the Department.

#### *Home Technology*

The Department of Home Technology was created by action of the University Council in June 1951, in spite of firm opposition from some faculty members at Diliman resulting in a very close vote.

Professor James Dayton in the Final Report of the Cornell-Los Baños Contract describes the underlying concept of the Department as that of

"producing generalists rather than professional specialists in such fields as nutrition, clothing, or home management.

"Still it is desired to develop a very special type of professional woman: one who can stand alone in a rural setting and teach author-

itatively all important areas of family living. Graduates of this course serve both as rural high school teachers and as extension home demonstrators. Laboratory facilities are representative of equipment found in the homes of rural people. The practical down-to-earth courses of study provide a fine background for the homemaker as well as the professional."

The Home Technology curriculum was not intended to compete with programs offered by the College of Home Economics at Diliman and when first instituted was considered experimental and tentative. The program consisted of two years of agricultural subjects and basic sciences in addition to a modified home economics program specifically suited to the needs of barrio life rather than to those of urban living.

The first assistance from Cornell to the Department was provided by Professor Esther C. Bratton, wife of Visiting Professor C. A. Bratton, who served during May and June of 1953 as a special consultant. At that time no space or equipment was available, so much of her time was spent contributing to a survey report by the Cornell team that detailed what was needed in personnel, supplies, and equipment for Home Technology. Work, however, was proceeding on the construction of one wing of a new building for the Department's use. Professor Bratton also assisted in revising the curriculum and in teaching a course. Although no research was underway at that time, Professor Bratton urged that work be started as quickly as possible. In the First Annual Report she wrote:

"The early initiation of a research program is vital for the sound development of the Department if it is to take its place as a part of the College of Agriculture and the Central Experiment Station. If the Department is to justify its existence apart from the Department of Home Economics on the main campus of the University it must make important contributions to the improvement of rural home living, which can be done only if based on a sound research program."

The only full-time visiting professor to the Department of Home Technology during the Cornell Contract was Professor Dorothy M. Proud who, like Professor Bratton, was from Cornell's College of Home Economics. Although the Department moved into its new building in June 1953, the Home Technology curriculum confronted major problems in expanding. For example, a budget request for the 1953-1954 academic year for money for a department head of full professorial rank, one associate professor, one assistant professor, and a research laboratory and equipment was turned down. By October 1954 when Professor Proud arrived, although conditions had improved somewhat and the teaching staff had been slightly expanded, it was still not adequate to handle the Department's 180 students.



*Extensive grazing experiments with improved grasses were initiated in 1955 as a cooperative project between Animal Husbandry and Agronomy. These tests showed great superiority of new, improved varieties over the native grasses.*



*Graduate students and technicians weigh forages from experimental plots.*



*First shipment of frozen semen arrives at the Manila airport on August 23, 1955, from the New York Artificial Breeders' Cooperative to use in upgrading of native cattle.*



*This calf was one of the first produced in the Philippines from imported frozen semen demonstrating the practicality of artificial insemination as a means of livestock improvement in the country. Insert photo shows Philippine scientist L. S. Castillo and Visiting Professor G. W. Trimberger doing laboratory experiments on semen preservation.*



Field days brought hundreds of farmers, plus representatives of government agencies and private industries, to the College and Central Experiment Station to observe demonstrations and results of research. Here a group of farmers and students observe a rice growing demonstration.



Farmers and students receive the results of research through exhibits, news and magazine articles, radio and other means of mass communications.



*Rehabilitation and development of the College of Forestry at Los Baños was a major aid undertaking of the International Cooperation Administration through contracts with Cornell University and the State University of New York College of Forestry at Syracuse. Shown here is one of the new buildings constructed for teaching and research.*



*The International House, built with primary assistance from the Rockefeller Foundation, provided housing and dining facilities for overseas and Filipino students at the UPCA.*

After a three-month orientation period in which she made trips to the Institute of Nutrition in Manila, visited two Home Economics Departments, as well as surveying the books and periodicals available in Home Economics at Los Baños, Professor Proud began her teaching and consulting activities. She conducted a seminar in nutrition for staff and seniors majoring in that area and also taught a course in home management and cafeteria management. She also assisted in planning a revision of the curriculum and in surveying and making recommendations regarding the campus food services.

Unfortunately, however, the Home Technology Department continued to be a subject of controversy within the University of the Philippines and the College of Agriculture. Many did not understand the objectives of the Department's program, and necessary support for growth was not provided. There was a lack of agreement between Professor Proud and some of the administrators over the goals and methods of the curriculum.

As a result of these circumstances the decision was made to discontinue assistance under the Cornell Contract, and Professor Proud returned to Cornell in June 1955.

In the Third Annual Report, Professor Montgomery Robinson, Project Leader, commented on the situation in Home Technology. He said:

"The immediate situation threatens the continued existence of a most promising teaching program. Immediate steps should be taken to appoint a well qualified head of this Department, a person of professional grade, a matron with rural background and with graduate training in Home Economics and Rural Education. Additional staff, including at least one of assistant professor grade, are needed at once."

Yet in spite of outside opposition and internal difficulties, the Department of Home Technology survived and continued to expand slowly. Support in the form of ICA-NEC overseas training was maintained for the instructional staff.

### *Agricultural Economics*

The Department of Agricultural Economics received assistance under the Cornell-Los Baños Contract for the full eight years of the program's existence. Professor C. A. Bratton of Cornell, the first visiting professor in the Department, arrived at the College in early October 1952 to find that the staff consisted of only three people—all below professorial level until the beginning of that month when one holding a Master's degree had been named Assistant Professor and Acting Head of the Department. One instructor had been associated with the College and the Rural High School since 1930 while the other

had graduated six months before with a major in Agricultural Education. Ten courses, four of them required by the College, were offered by the Department, but the staff had no teaching or office space and was "squatting" in the Entomology and Plant Pathology Buildings. Equipment consisted of two desks, two chairs, and a hand-operated "baby" Monroe calculator.

#### EARLY IMPROVEMENTS

Following the preparation of an initial survey of the needs of the Department, Professor Bratton began the task of strengthening teaching, research, and extension in Agricultural Economics. To begin with, two new instructors, a person for computing work, and a stenographer were hired. Two research fellowships were established as well, but they remained vacant at the end of the 1952-1953 academic year. A new building started in October was finished and equipped by mid-June 1953. Some equipment for teaching and research was obtained and many additional orders requested.

A major problem was again the teaching load. Professor Bratton taught two courses each semester, including marketing agricultural products, rural credit, rural cooperatives, and agricultural economic statistics, in addition to assisting with the departmental seminar. Several courses were revised, and a graduate thesis course added to the curriculum to enable the Department to give the Master's degree.

As in many other departments, a large part of the research consisted of thesis work by seniors and other undergraduates majoring in the field. Professor Bratton gave help and advice in these various projects and also assisted in organizing and carrying out four field studies during the summer vacation. He initiated studies on assembling basic economic data and on the prices of Philippine farm products. More than 1,500 records of economic conditions in rural communities were obtained to provide a basis for teaching and further research programs. Thirteen additional projects were started, and by the end of the academic year analysis of the data obtained in the field work was well underway.

In extension work, a training school for field agents of the newly-organized Agricultural Credit and Cooperative Financing Administration (ACCFA) was held, and help was given in an advisory capacity to ACCFA throughout the year. Material prepared in mimeograph form for the training school was later used as the basis for booklets. Discussions were held with the staff of the DANR to plan an agricultural economics division in the organization. Plans were also outlined for a cooperative research project with the Philippine Sugar Institute.

Following this first year, Professor Bratton made several observations on the position of the Department of Agricultural Economics

in the College and in the Philippines. First, he found possible contributions to development in the Islands practically unlimited. Whether or not the Department—and the College as a whole—could make these contributions depended primarily on an aggressive and well-planned program for improvement within the College. This in turn depended on stability in the staff, which in Agricultural Economics had been lacking. Better salaries were needed, and, if research was to be conducted, advanced training of the staff was essential. He suggested that assistance continue until this training was obtained.

Professor L. S. Robertson of Purdue University, the second of six full-time visiting professors, arrived in Los Baños a month before Professor Bratton's departure and quickly familiarized himself with the problems and programs of the Department. He also found it necessary to devote much time to teaching agricultural economic statistics, farm finance, and seminars. In spite of the heavy teaching load, however, major efforts were directed to research.

During the 1953-1954 academic year four farm management projects were completed, as was a study of student living costs at the College. Working closely with the acting head of the Department, Nathaniel Tablante, Professor Robertson helped analyze data from this research and prepare five manuscripts reporting the results. Except for two papers on student costs, the manuscripts dealt with economic factors in the success of rice and coconut farms. Several new projects were initiated, among them a study of labor-management relations on the Canlubang Sugar Estate. An economic and social study of the experiences of settlers in two areas of Mindanao was planned in coordination with other College departments, and the FOA, the Bureau of Lands, the new Division of Agricultural Economics of the DANR, and the Land Settlement and Development Corporation. Although work on the project was started during the year, the full program was not slated to get underway until 1955.

#### PHILIPPINE NEEDS ARE ANALYZED

A careful analysis of research needs of the Philippines and a list of priorities for the Department were mapped out under Professor Robertson's supervision. Specific areas included farm management, land tenure and settlement, marketing and prices, farm finance, and public policies. Because facilities for research were so meager, however, it was necessary to specify exactly what needs were most urgent and within the scope of the College staff in Agricultural Economics. So emphasis was placed on digging deeply into a few facets of these fields rather than conducting surface-level evaluations of many.

Extensive work was also done in improving public relations, especially with government agencies. Two all-day conferences with

representatives from FOA, DANR, PHILCUSA, and NEC, were hosted by the staff of Agricultural Economics. The ACCFA, the Central Bank, the Rehabilitation Finance Corporation, the Philippine National Bank, the NEC, PHILCUSA, and the Philippine Sugar Institute were all contacted for suggestions for problems on which the College might conduct economic research. Speakers from several of these organizations also appeared on campus during the year. Advice was also given to the House Agricultural Committee on rice legislation and to the National Rice and Corn Corporation on governmental price fixing of rice and the production, warehousing, and marketing of palay. Even in light of all these contacts, however, Professor Robertson urged that greater emphasis be placed on contacting farmers and businessmen and in disseminating information more widely.

The third visiting professor in Agricultural Economics was Dr. C. D. Kearl of Cornell. A month before his arrival in mid-1954, Professor Tablante, acting head of the Department, resigned. Dr. F. M. Sacay, head of the Department of Agricultural Education, was appointed head of Agricultural Economics, but before the year was out he had accepted a position as assistant administrator of ACCFA and was on leave from the College. His departure not only left the Department without a head, but without anyone of professorial rank. As a result Professor Kearl was requested to serve as acting head by Dean Uichanco.

#### THE CECA OFFERS AID

During Professor Kearl's first year in the Philippines many significant changes in the staff of the Department occurred. The Council on Economic and Cultural Affairs (CECA) granted Cornell \$34,000 to support a second visiting professor at Los Baños for two years. Professor Horst von Oppenfeld was named to the position and arrived in June 1955. CECA also financed the overseas graduate study of Orlando Sacay, and B. N. de los Reyes attended Cornell under the sponsorship of FOA.

Although there were no Filipino professors in the Department, the staff at lower ranks was substantially increased during the year—enough so that Professor Kearl considered the number adequate for the immediate necessary work. In July 1954 there were eight positions below the rank of professor; by July 1955 that number had increased to 32. As a result of this increase in staff size and because of the increased student enrollment, Professor Kearl found that the Agricultural Economics building, although adequate two years earlier, was too small. Some courses involved up to 900 students, and the lecture hall held only 180. The amount of equipment had improved greatly in those two years, but additional equipment and calculators in par-

ticular were still needed. Most of the purchases came from a grant of \$5,000 from CECA and a donation from Professor Robertson. New books, including 20 to 30 copies of four basic texts, were bought with FOA funds or were donated.

Fourteen student thesis research projects were completed during 1954-1955 and another 66 partially completed by mid-1955. Regular departmental research had progressed as well. Studies of price movements of major agricultural products and prices of representative consumer products were ready for publication. A study of costs of rice production was completed and work on abaca prices and marketing was already partially published. Other studies from previous years were actively continued, and nine individuals including Professor von Oppenfeld were engaged in a major examination of land use, farm management, and tenancy. Also planned were projects dealing with coffee and cacao production, rice consumption and marketing, poultry farming, vegetable production, and the socio-economics of sugar production.

These research projects occupied much of the time of the visiting professors and their Filipino colleagues during the following year. The farm management studies produced significant results and about 7,000 records were compiled dealing with types of farms and their status throughout the nation. When completely analyzed the data yielded information about land values, unemployment, credit, housing conditions, land use, tenancy, and management. Another phase of the study concerned the unit requirements of rice production; data were recorded from about 300 Central Luzon farms. Sixteen articles and papers were published by the staff during the academic year.

Facilities and books continued to improve during the 1955-1956 academic year, thanks to ICA funds and grants from CECA, the Rockefeller Foundation, and a private donation from Dr. F. F. Hill of the Ford Foundation. Unfortunately, the teaching load increased, thus placing further stress on the staff and space of the Department.

Several administrative changes occurred during the year with the organization of an advisory committee structure composed of policy and personnel; curriculum and teaching; research and information; building, equipment, and supply; and student guidance and activities. Departmental bookkeeping and up-to-date accounting practices were established as well. All of these improvements came about largely through the work of Professor Kearl.

Closer relations with outside agencies were encouraged, too. During one semester the departmental seminar was led by outside lecturers from the Agricultural Tenancy Commission, NARRA, ACCFA, the BPW, and ICA. Assistance was given in the Community Development Training School in barrio survey techniques and to NEC in planning

a National Household and Employment Survey. In addition, the Department received a share of the National Rice and Corn Corporation (NARIC) grant of 350,000 pesos. Contacts with the Farm Economics Association of the Philippines were also strengthened.

Professor G. W. Hedlund, professor of Business Administration and head of Cornell's Department of Agricultural Economics, arrived at Los Baños in June, 1956 as Professor Kearn's replacement. Professor von Oppenfeld continued to serve with CECA support.

#### STAFF PROBLEMS REMAIN SERIOUS

The major problems in the Department still involved the staff: the need for more training and experience. The situation was improved with the return of Mr. P. R. Sandoval from graduate work at the University of Minnesota who was named to head the Department. Five members of the staff also received the Master's degree during the year and three others were doing graduate work. Even so the staff remained predominantly inexperienced in agricultural economics work. Greater time spent in research, particularly off-campus work, was needed to help correct this situation, and, as Professor Hedlund pointed out, better salaries and regular promotions would also mean that the more experienced members would not so easily be attracted to higher paying jobs elsewhere.

During 1956 the project on farm management, land use, and tenancy was completed with data collected from 5,344 farms. Professor von Oppenfeld helped analyze these results, and by the end of the year the study was ready for publication as Central Experiment Station Bulletin No. 1. Professors von Oppenfeld and Hedlund considered this the most ambitious project ever undertaken by the Department. Mr. Sandoval also completed and published his study of Socio-Economic Conditions of Settlers in Kidapawan, Mindanao. His work revealed as the major problems lack of tools and equipment, lack of feeder roads, lack of work animals, inadequate marketing systems, prevalence of plant diseases and pests, and insufficient operating funds. Marketing studies of rice and palay were also completed, and work on rice milling and farm finance progressed rapidly.

Cooperative work from previous years was continued; new events included a school for loan examiners conducted at the College by staff of the Department and ACCFA, and participation by both visiting professors in an FAO-sponsored farm management development center in Japan in late 1956.

#### THE DEPARTMENT MATURES

Professor L. B. Darrach of Cornell succeeded Professor Hedlund in July 1957, and his two-year stay in the Philippines was a period of

great importance and significant accomplishments in the maturity of the Department. After the first year Professor Darrah reported:

"One cannot have worked in the Agricultural Economics Department for a full year without having observed—in a very real sense—the growing maturity of the Department. The staff has developed professionally, the teaching program has been broadened and consolidated, the research program has expanded and developed at a higher, more intense level, and the Department as a whole has accepted willingly greater responsibilities in the affairs of the College community."

Five new courses were added to the teaching program—accounting, agricultural policy, public problems in agriculture, special topics, and advanced agricultural economics. As a result two previously undeveloped areas of undergraduate education—policy and accounting—were covered, and graduate opportunities included for those outside the Department electing Agricultural Economics as a minor. In addition several courses were consolidated to eliminate overlapping, and introduction of an Agricultural Credit and Cooperatives Institute (ACCI) further broadened the program.

Teaching materials and information designed for the Philippines also brought improvement. Dr. Amando M. Dalisay, a lecturer in the Department, prepared a book on "Agricultural Policy in the Philippines," and a manuscript was written by Dr. Darrah on "Marketing of Farm Products in the Philippines."

The maturation of the research program was highlighted both by an increase in outside grants (including 20,000 pesos from CECA, 24,837 pesos from NARIC, 9,080 pesos from ACCFA, and 11,890 pesos from the Community Development Research Center) and by a general shift from thesis research projects to major programs by the professorial staff of the Department. Even the Farm Management, Land Use and Tenancy study had been largely composed of separate projects by well over 30 students. New research techniques were employed, in particular, interviews with and surveys of farmers were deemphasized in favor of, for example, experimental testing of marketing procedures and techniques. This expansion into major marketing studies of poultry and eggs, rice, livestock, vegetables, and fruits offered yet another instance of the growth of the entire research program.

Relationships within and outside the College advanced as well. Professors Sandoval and Darrah were named to a College committee to develop plans for ACCI to be located at Los Baños. The eventual proposal called for construction and equipment financed by \$175,000 from Asian Economic Development Funds. The Institute, which was to work in conjunction with the Department of Agricultural Economics, was approved during the year by the University of the Philippines Board of Regents, NEC, and ICA.

Staff members also advised a large number of government agencies: ACCFA, Central Cooperative Exchange, Land Tenure Administration, and the Agricultural Tenancy Commission.

The 1958-1959 academic year was as rewarding as the previous year. With the Cornell-Los Baños Contract drawing to a close, the Department of Agricultural Economics gave every indication of being ready to proceed on its own. Five new courses added to the curriculum in the previous period were implemented, and instructors were working at preparing mimeographs of lecture materials. Sixteen major research projects were in progress at the end of the year, and every professor, instructor, and assistant instructor in the Department was actively engaged in at least one of them. Studies included examinations of real property taxes as a source of income for barrio governments; crop sharing arrangements of rice farms; expenses and returns in rice retailing, corn production, coconut production, and other major crop activities; pilot studies in farm development, crop loan operations of the ACCFA, effects of pump irrigation, and management of sugar cane and poultry farms; and improved merchandising practices. Altogether, men serving in the Department published 15 articles.

Work continued toward establishing the ACCI, and Professor Darrah, who had been named Acting Director of the Institute, spent considerable time working on the charter, recruiting personnel, and outlining the program. In his Terminal Report he stated that the Institute was to have three major purposes: training of third-country students and personnel in credit and cooperative organizations through in-service programs, regional seminars and workshops; teaching of Filipinos for employment in credit agencies and cooperatives and the in-service training of Filipino employees and officials in that work; and expansion of the research program both as a separate entity and with the Department of Agricultural Economics.

#### LONG-RANGE GOALS

In the Seventh Annual Report of the Contract, Professor von Oppenfeld, who was completing his fourth year at Los Baños, stated what he believed agricultural economics' goals in the Philippines should be and how far the Department had come in seven years:

"In a developing economy such as the Philippines, the need for improved technology in agriculture is widely understood. It is not too difficult to find support for technical assistance in biological sciences or agricultural engineering.

"Less well understood is the role of agricultural economics within the college program. First, it provides for all undergraduate students familiarity with the fundamental economic principles that affect everyday life in their society. Undergraduates study the sociological

relationships and the institutional framework that permit or limit the application of agricultural technology. They learn to proceed from an organized appraisal of economic facts to decisions made on a rational rather than an emotional basis. They learn to be critical of political slogans or programs with economic implications.

"The second major function is to offer training in specialized branches of agricultural economics to smaller groups who will have need for it: teachers, research technicians, farm and business managers, and government officials.

"Third, agricultural economists must conduct research that is both problem-defining and problem-solving. In the process research methods must be developed. Methods developed elsewhere are not widely applicable here. Agricultural economics as a science originated largely in Western countries. Neither in the Philippines nor in other Asian countries has it found the optimum level of usefulness.

"Fourth, agricultural economists must help scientists promote the use of technology on farms, in marketing firms, cooperatives, and banks. There is evidence that the gap between proven technical advances and actual application is widening. Indeed, some of the most primitive farming methods are observed within a few kilometers of the college campus. Rational farm management or marketing principles are still widely ignored. The agricultural economist can play an important role in an effective program of agricultural extension or community development. To date he has not done so. Each of the two agencies administering these programs here employs more than one thousand field and office workers, specialists and administrators, but not one agricultural economist.

"Agricultural economists at Los Baños have progressed toward these goals. They have improved and broadened the teaching program, have stepped up research efforts and have contributed toward a more immediate application of research on farms. Nevertheless, there is still a tremendous unfinished task in each of these four basic areas. Visiting professors have accelerated the process; the main goals must be reached by their Filipino colleagues."

#### ASSISTANCE BEYOND 1960

With the end of the Cornell-Los Baños Contract in June 1960, assistance to the Department of Agricultural Economics did not come to an end. Professor von Oppenfeld, under a special CECA grant, was designated to continue work at the College until 1962. The assistance that he and the other visiting professors had already given, however, had enabled the Department to develop into one of the largest in the College, with active teaching, research, and cooperative programs.

From the three members present upon Professor Bratton's arrival in 1952, the staff expanded to include during the 1959-1960 academic year 37 full time employees including three assistant professors, seven instructors, and a total of 19 professional members. Eleven staff mem-

bers had received fellowships for advanced study at American universities; seven fellowships were granted by the ICA-NEC, four by the CECA. Nine of these men returned with Master's degrees. Two additional instructors were hired after obtaining M.S. degrees in the United States, and three others received Master's degrees at Los Baños. CECA in addition was supporting four members for Ph.D. study in the United States at the close of the Contract. Some of these gains, however, were offset by resignations.

Between 1951 and 1960 the courses offered by the Department had doubled from 10 to 20. The only areas needing greater instruction in 1960 were prices, farm appraisal, and rural government finance. Professor von Oppenfeld added in the Final Report that the graduate program would certainly need strengthening now that visiting professors would no longer carry the teaching load in this area.

The research program over the eight years had progressed from largely short-term undergraduate thesis projects assembling basic economic data, to cooperative studies in farm management and, later, marketing, and to problem-solving experimental research. Funds from outside sources had gradually expanded, as had also the number of articles and other publications produced by the staff.

The equipment and facilities of the Department of Agricultural Economics, both of which had been practically nonexistent in 1952, included a building constructed in 1953, remodeled in 1956, and enlarged by addition of a two-floor annex in 1959; a staff library containing needed reference material; and equipment purchased over the Contract period with grants from ICA-NEC, CECA, ICA-Cornell allocations, the University of the Philippines, the National Rice and Corn Research Corporation, and the Rice and Corn Research program.

Cooperative relations had been developed among many others with the ACCFA, the ACCI (which opened its doors at Los Baños in April 1960), the Agricultural Tenancy Commission (ATC), NARRA, NARIC, the Community Development Research Center, the Farm Economics Association of the Philippines, the FAO, and the BAE. Cooperative research programs had been established, in-service training sessions conducted, advice and consultations given, and academic programs organized. In addition, staff members were involved in work with other colleges in the Philippines, including Silliman University and Mindanao Agricultural College.

The growth and maturation of the Department brought for it also an increasing role in training students from other Asian nations including Vietnam, Indonesia, Pakistan, and Korea. Staff members had also participated in several international conferences: FAO in Japan, India, and Thailand; the International Conference of Agricultural Economists in India; and CECA in Indonesia.

Thus by 1960 the Department was actively pursuing the three goals intended by the signers of the Cornell-Los Baños Contract in 1952: teaching, research, and extension and external relationships. "U.P. Agricultural Economics has developed many activities which strengthen the College," Professor von Oppenfeld wrote in 1960. "Its present staff is young and can be expected to make greater contributions in future years."

### *Agricultural Education*

The Department of Agricultural Education was established at Los Baños in 1928 to train teachers and supervisors of high school level agricultural instruction. The following year the Rural High School, a division of the Department, was created to provide laboratory-type training for prospective agricultural teachers and to give young people interested in agriculture as a vocation background in the field.

The first visiting professor of Agricultural Education, Russell B. Dickerson of Pennsylvania State University, began work in June of 1956. At that time the Department was involved in organizing the new community development program, extension education and extension training, and assisting the Bureau of Public Schools (BPS) in coordinating vocational agricultural education in high schools throughout the Philippines. Professor Dickerson and his successor, Professor Harold R. Cushman of Cornell, were the only two visiting professors directly concerned with Agricultural Education in the course of the Contract.

Professor Dickerson reported that, in his opinion, the most notable achievement during the first year of assistance was the strengthening of relations between the staffs of the Department of Agricultural Education and the Bureau of Public Schools:

"Considering the fact that more than 80 per cent of the teachers of agriculture and more than 90 per cent of the administrators in the 40 rural and agricultural high schools are graduates of Los Baños, it is highly desirable that good public relations and cooperation are obtained between the Department, the schools and the Bureau. This should be easy to bring about because of the common interest already existing."

To help meet the demand for qualified teachers for the Bureau's high schools, he felt that it was essential to participate in both the Department's teaching and research. During the year major changes were made in both the curriculum and individual courses, with new courses being added on both the undergraduate and graduate levels.

Also during the 1956-1957 academic year an Extension Option for Education majors wishing additional emphasis in the goals and meth-

ods of extension work was approved. In addition, Professor Dickerson assisted in conducting the annual summer in-service training school for BAE personnel.

#### INSTRUCTIONAL MATERIALS PROJECT

Research activities centered on a proposal for measuring the effectiveness of different methods of presenting information from studies of efficient livestock and crop production. The CECA agreed to provide a 30,000 pesos grant-in-aid for the project upon approval of a final plan. Following Professor Dickerson's departure and the arrival of Professor Cushman in February 1958, this project continued to be of primary importance to the Department.

During Professor Cushman's first year at Los Baños several conferences and meetings were held involving personnel not only from the College and the Department but representatives of the Bureau of Public Schools (BPS), nine agricultural high schools, the DANR, and the ICA. An Advisory Committee composed of members of various departments and divisions within the College of Agriculture, and BPS, ICA, BPI, BAI, and BAE of the DANR was organized. Great importance was attached to this project because there were almost no instructional materials appropriate for teaching vocational agriculture and also because little was known about what methods and kinds of instruction would be most effective in this area.

Five agricultural teachers, placed on leave by the BPS for a year, were hired as research writers for the project, and plans were made to test poultry and swine manuals in several agricultural schools. A graduate student and a research assistant were employed to analyze statistically the effectiveness of the two manuals. Long-range plans called for these manuals to be published and distributed by the BPS during 1959.

Other research in Agricultural Education involved studying what kinds of subject matter teachers of agriculture needed to keep abreast of current research and technology, what could be done to improve the supervised farming programs taken by high school students, what mechanical skills teachers of farming needed, and the occupations of agricultural school graduates.

Both Professors Cushman and Dickerson were also concerned with the off-campus student teacher program and with the graduate curriculum. At the end of 1957-1958 year four students were awarded the first Master of Science degrees given in Agricultural Education at the University of the Philippines. Additional contributions included revision of departmental administration by which numerous responsibilities were delegated to seven newly created sections.

During Professor Cushman's final year at Los Baños the experi-

mental field tests of the poultry and swine production manuals were conducted at three Luzon agricultural schools. Analyses of the results showed that the manuals had significantly improved student learning in those fields. Before he left in July 1959, Professor Cushman supervised the writing of ten other manuals in the fields of cabbages, corn, dairy, ducks, onions, peas and beans, *pechay*, rice, sugar cane, and tomatoes.

Other significant developments during the 1958-1959 academic year included the following: the College faculty approved a change in the Agricultural Education curriculum that required all majors to practice teach off-campus for a minimum of eight weeks, in addition to teaching in the Rural High School; summer session courses for agricultural teachers were offered and Professor Cushman gave a non-credit course on methods of research; Professor Cushman also helped produce the first "Summaries of Studies in Agricultural Education in the Philippines" by coordinating the work of the BPS and five teacher training institutions.

#### RECOMMENDATIONS FOR EDUCATION

At the end of their stays at the College of Agriculture both Professor Dickerson and Professor Cushman were pleased that most of the recommendations they had made were acted upon by the staff and administration. Those recommendations included the following:

1. Expansion of research and graduate programs for agricultural teachers.
2. Institution of a counseling and guidance service for all students.
3. Introduction of a scholarship program for students needing financial assistance and deserving academic recognition.
4. Creation of administrative positions for supervision of resident instruction and coordination of research.
5. Continuation of Agricultural Teacher Education Conferences and implementation of the resultant recommendations on selection, grading, essential skills and course background, and placement of prospective agricultural teachers.
6. Expansion of the Department's physical plant.
7. Upgrading of facilities for training agricultural homemaking teachers.

#### *Office of Extension and Publications and Agricultural Extension Education*

During the course of the Cornell-Los Baños program many significant changes occurred in agricultural extension education and the coordination of publications, in-service training activities, field days, and public relations at Los Baños.

The development and coordination of these programs took place gradually over the period of eight years and several visiting professors were involved.

#### EXTENSION EDUCATION BEGINS

The first Project Leader, Professor Montgomery Robinson, devoted a portion of his time to extension teaching, partly because the original Contract called for an Agricultural Extension Specialist to be included among the four specified technical visiting staff. An oral agreement was worked out, however, whereby Professor Robinson would combine those duties with those of Project Leader.

Professor Robinson presented the first course in extension organization and methods ever given in the field at the College of Agriculture in 1952. The enrollment totaled 30, mostly seniors and graduate students. Guest lectures were presented by personnel from the BAE, MSA, and other visiting professors from Cornell. Professor Robinson also participated in a district training school for extension personnel in the province of Pangasinan.

At the end of the first year of assistance, Professor Robinson assessed the status of the extension field in the College:

"Eventually, the College of Agriculture may be expected to develop its extension teaching function and responsibilities. But it will come slowly. Limited funds, an already overloaded staff, inadequate travel allowances, and the vital importance of giving priority attention to a broadened and deepened program of research are some of the reasons."

In spite of this overwhelming need for funds and assistance in other areas, steps were taken to develop an agricultural extension program. Major advances included cooperative efforts between the College and the then new BAE within the DANR. Bureau personnel assisted in the extension methods and organization course, and on campus and in the provinces the College conducted subject matter training schools that were attended by Bureau staff members. DANR personnel also participated in these activities. The Cornell staff became acquainted with personnel in other government agencies as well as with leaders in sugar, abaca, coconut, and rice industries. In addition, one of the first members of the Los Baños staff sent overseas for study was an instructor who planned to concentrate on extension upon his return.

Professor Robinson concluded his extension report that first year in this way:

"Obviously, it is not learning alone but the spirit of service that will give a college place in the public annals of the nation. . . . The stimulus of research and of teaching must not reach only scholars in other institutions, but the general public. Clearly, the College of Agriculture

has the two-fold responsibility to direct its research projects toward solution of practical problems of agriculture and insure that farmers and housewives receive promptly the benefits of scientific investigation. The writer believes that effective steps toward the implementation of these objectives are in motion through the development of mutual understanding and cooperative effort between the College and the BAE in the realization that there is no room in the national economy for overlapping or duplicate agencies, but ample opportunity for service to agriculture through cooperative and noncompetitive effort."

#### FIELD DAYS ARE INTRODUCED

In the following year 1954-1955, Professor Robinson continued to give the extension organization and methods course with assistance from the BAE and the FOA. The year was highlighted, however, by efforts to acquaint Filipino farmers with the work of the College through field days.

A series of six field days was arranged by a committee composed of members of several College departments and Cornell staff and chaired by the head of the Department of Agricultural Education. Each one-day event was devoted to a particular crop or area of farming such as rice and corn, poultry, and machinery. The day's program included demonstrations, exhibits, and forum discussions. Total attendance was about 2,000, with many of them DANR employees and farm supply dealers. The program soon expanded, however, in attendance and in areas of work covered.

#### OFFICE OF EXTENSION AND PUBLICATIONS

Early in October 1954, shortly after Professor A. J. Sims, University of Tennessee, arrived as its first visiting professor, the Office of Extension and Publications was established as a section of the College's Administrative Organization responsible to Dean Uichanco. Two offices and a classroom in the administration building were made available.

Assisting Professor Sims in the newly-created office was Thomas G. Flores, who originally graduated from the U.P. College of Agriculture as a major in Animal Husbandry, was an instructor in Agronomy, and received an M.S. degree from Cornell in Extension Organization and Methods in September 1954. Two other people, both with experience in news writing and editing, were employed, as was also a student assistant. Professor Sims noted that:

"The broad objectives of the Office, as agreed upon with the Dean of the College and the Cornell Project Leader, were to expand and facilitate the work of the College in handling news, radio, and other information materials on research results and other activities of the

College; the editing, printing, and distribution of publications of various types; the development of visual aids and other exhibit materials; teaching of Extension Methods, an elective course for junior and senior students, in cooperation with the Department of Agricultural Education; the development of working relationships with the press, radio stations, the Office of Information and the BAE of the DANR, and other government bureaus and agencies."

The first of these objectives was the expansion and strengthening of the College news service. Before the Office of Extension and Publications was organized, information activities were largely limited to irregular press releases, a bimonthly bulletin for faculty, students, and alumni, and publication of the *Philippine Agriculturist*, a monthly technical research journal. Now, however, the news service was expanded to cover research, and events and activities at the College. A regular news sheet was sent to 30 newspapers throughout the country. By mid-1955 nearly 200 general news stories and nine illustrated feature articles had been sent out.

The *Monthly College Bulletin* was expanded from four to eight pages, and arrangements were made with the Office of Information of the DANR for a two-page section dealing with College activities in the *Filipino Farmer*, a Tagalog magazine. The Office assisted news personnel from papers and magazines that wanted their own stories about the College. Assistance as well as news was also supplied to the radio section of the DANR Office of Information.

Less work was done with publications, primarily because of insufficient funds. The *Philippine Agriculturist*, however, was brought up-to-date; when Professor Sims arrived it had been a year behind. Plans were formalized for printing several circulars and leaflets the following year, and consideration was also given to revising and reissuing some of the 35 subject-matter circulars printed in pre-war years by the College.

Use of visual aids was increased during the 1954-1955 academic year with emphasis on using photographs in College publications and in press releases. Basic equipment for drawing and projection was also obtained.

The teaching program in extension was likewise given attention by the new office. The extension organization and methods course was turned over to the Office under the direction of Mr. Flores and taught in cooperation with the staff in Agricultural Education. In addition to the 61 students who took this course, another 65 enrolled in the summer short course in Extension Methods. For the first time in the College's history, an in-service training program was undertaken for provincial extension workers in connection with leadership and group development courses given by the staff in Agricultural Education. The

25 people attending the course represented 19 provinces and all nine Philippine extension districts.

Public relations activities that first year included 4-H Club rallies, BAE meetings, tours, and conferences at the College, participation in the Agricultural Information Council of the DANR Office of Information, handling of visiting groups, and holding six Field Days.

The Office was responsible for setting up a central mailing and duplicating section for mimeographing and small printing jobs. A job press, a multilith press, an addressograph, and two mimeograph machines were also obtained.

The following year Mr. Flores was promoted to Assistant Professor and Head of the Office of Extension and Publications. In the 1955-1956 fiscal year over 300 press releases were issued to 98 newspapers, magazines, farm journals, and other publications. Work in visual aids continued, as did the Field Day program. Attendance for the three Field Days in rice and corn, farm mechanization, and livestock and poultry doubled from the previous year's total to 4,000. Professor Flores also served as secretary of the College Field Day Committee which was responsible for printing and distributing programs, preparing publicity, developing exhibits and demonstrations, and preparing the schedule of activities.

During the period immediately following Professor Sims's departure in March 1956 and before the arrival of Professor William B. Ward of Cornell in June, assistance to the Office was provided by Mr. Harold Christie, ICA Agricultural Information Advisor, on a weekly basis—further evidence of the development of cooperative relations between the Office and the ICA, as well as with Philippine government bureaus.

#### THE OFFICE'S ACTIVITIES EXPAND

Professor Ward's year in Los Baños comprised the last term of assistance on a full-time basis given to the Office of Extension and Publications, and much was accomplished.

The facilities of the Office were expanded. A darkroom was built and equipped, considerably speeding up the photography work. An audio-visual equipment pool was established for the use of the entire College. Also, the mailing and distribution of all College-printed publications was assigned to the Office. All of these moves resulted in greater efficiency for the Office and the College as a whole.

Although the staff of the Office remained relatively small, arrangements were made for advanced overseas study for three members. Miss Nora Cruz, associate editor of the *Philippine Agriculturist*, was working for a Master's degree in Agricultural Journalism at the University of Wisconsin; Mr. Juan Jamias, head of the Press and Radio Service, was to spend the following academic year at Wisconsin also;

and Professor Flores was to spend 1958-1960 under a Rockefeller fellowship at Wisconsin in pursuit of a Ph.D.

While the staff of the Office was mapping out plans for advanced training, the teaching program was expanded at Los Baños. In cooperation with Agricultural Education, courses in methods of extension teaching and the organization and administration of agricultural extension work were taught by Professor Flores. A course in communication skills was presented for the Community Development program from April to August 1956 and again from February to May 1957. Both Professor Ward and Professor Lincoln Kelsey, who worked in Extension and Community Development, assisted. In-service, audio-visual training was provided for two BAE schools, and a summer course in Communications and Public Relations was presented for extension workers.

#### INFORMATION FUNCTIONS DEVELOP

Public information functions of the Office took on greater significance according to Professor Ward because of four dominant trends, including the increasing service value that the College administration placed on communications; the positive attitude of the faculty toward serving agriculture through mass communications channels; a growing demand and reliance on the College by news media; and closer cooperation with government agencies including the DANR, BAE, ICA, ACCFA, and the Central Cooperative Exchange.

In line with these trends, the information work of the Office was reviewed. A communications study sponsored by the University of the Philippines' Social Science Research Center covering 2,268 households in 58 Philippine barrios resulted in several conclusions on extension of public information by the College. The study showed: that magazines were widely read, particularly if written in the vernacular; that radio reached only a small percentage of barrio dwellers but a high percentage of influential landowners; that photographs and realistic drawings were more popular than comic drawings; and newspapers were well read, particularly the *Manila Times*. Another survey indicated that nearly two-thirds of the participants had not gone beyond the fourth grade. These survey conclusions were considered extensively in the Office's planning.

General press coverage expanded during the year, and radio stations requested more information from the College. The first College Radio Farm News Service was started and brief news reports were sent bi-weekly to 22 radio stations. Tape recordings covering recent research results were provided for BAE mobile audio-visual units. A dozen tapes were also prepared for broadcasting in New York State; these dealt with the partnership between Cornell and Los Baños.

## PUBLICATION ARRANGEMENTS ARE MADE

Of great significance for the production and dissemination of publications was an agreement signed in August 1956 by the College, the BAE, and the DANR, calling for the preparation by the College of extension-type bulletins and leaflets based on Central Experiment Station Research. These publications were to be published by the College and the DANR jointly, with the latter paying printing costs. The BAE would then distribute them to farmers and barrio residents. The first publications issued were "How to Harvest and Store Vegetable Seeds," and "How to Prepare Ham-Cured Duck." Thirty thousand copies of each were printed.

In connection with the Office of Extension and Publications, Professor Ward helped produce a brochure entitled "New Agricultural Horizons—An Account of the Rebirth of the University of the Philippines' College of Agriculture at Los Baños and Its Partnership with Cornell University." This was published in Ithaca, New York, and distributed to government officials, educators, alumni, and others in the Philippines and the United States. A documentary film, "New Horizons in Philippine Agriculture: The Los Baños Story," was produced in cooperation with the United States Information Service.

At the close of his stay in the Philippines in June 1957, Professor Ward assessed the major problems of the Office of Extension and Publications and offered the following recommendations:

1. Obtain a definite yearly budget for production of leaflets, bulletins, and other printed material.
2. Conduct research on how to improve channels of communication between scientists at the College and barrio farmers.
3. Start a film library and build up the Visual Aids Service.
4. Pay close attention to Philippine television so that it can be used for communicating information from the College
5. Develop a College Alumni Association.
6. Establish the Office as the Department of Extension and Publications on an equal footing with other College departments.

Following Professor Ward's departure, Professor L. D. Kelsey continued to provide assistance to the Office although most of his time was spent in Community Development work. The work of the Office was well established by this time, the major change being in the teaching program and the major growth in international extension.

## THE EXTENSION EDUCATION OPTION

The 1957-1958 academic year marked the first time that the Department of Agricultural Education included a special program for undergraduates who wanted to study extension work. This Extension Option enabled a student to work in general agriculture and at

the same time take courses useful to extension workers. Six students elected the Option for the 1958-1959 school year. During the year plans were also discussed for a graduate level extension education program.

#### INTERNATIONAL EXTENSION GROWS

The College and the BAE welcomed 18 delegates from 12 Southeast Asian nations to Los Baños during November 1957. The group composed the Extension Study-Tour of the Food and Agricultural Organization (FAO) of the United Nations. The delegates were housed in the Community Development Center on campus and were involved in discussions of pre-service and in-service training, agricultural publications, BAE work in the Philippines, and the relationship of Extension to Community Development.

The growing role in international extension was further evidenced by the holding of the First Regional Agricultural Extension Training Center for Asia and the Far East at the College in 1958 along with the fourth In-Service Training Summer School for BAE employees. The Extension Training Center was conducted at the request of the FAO and with the approval of the Cabinet of the Philippine government. Financial support was also obtained from the CECA. A total of 17 FAO participants from Burma, China, India, Japan, Korea, Malaya, Philippines, Thailand, Hong Kong, North Borneo, Sarawak, and Singapore attended the session.

During the year an Extension Committee was established by the faculty of the College to improve departmental inputs into the Office of Extension and Publications and planning intelligent use of the Office's facilities and personnel. In addition, by the end of the year practically all mimeographing and multilith printing for the College was being done by the Office.

#### GOVERNMENT RELATIONS

Closer relations with government bureaus continued, but Professor Kelsey noted that the possibilities for cooperative efforts between the College and the BAE in particular were not being fully explored. As an example he cited the need for specialists:

"Neither the U.P. College of Agriculture nor the BAE has enough specialists in proportion to workers in the field, and to the area to be covered. There is a lack of specialists in some of the most important crops in the Philippines, such as coconuts, coffee and cacao, not to mention processing and marketing. Here is a place for the College and BAE to work together to get the necessary funds.... Unless these specialists are hired by BAE or the College, there is a tendency for other agencies to secure them and thus further scatter the educa-

tional and research work among government bureaus. This is in opposition to the recommendations of the Bell Mission, the Wilson Report of 1955, the policy of the Philippine Survey and Reorganization Commission and the intent of Republic Act No. 680. Increase in the number of specialists in BAE is one of the strong recommendations of ICA.... Hence the College and BAE should present a unified front in this matter."

Professor Kelsey returned to his duties with the Cornell Extension Service in July 1958 and was succeeded by Professor James Dayton of the University of Massachusetts who arrived five months later to work in Extension with emphasis on the academic program under Agricultural Education.

During the following summer 11 undergraduates who had elected the Extension Option were given a period of field training in a barrio under the supervision of BAE and the Department of Agricultural Education. Relations with BAE were also strengthened by the greater contact with College committees and work at the departmental level.

Professor Dayton was also involved in setting up a reference library of books and pamphlets relating to extension and other areas of adult education. Funds from the Cornell Contract were used to purchase some of the books, many of which came from the University of Massachusetts, the United States Department of Agriculture, and the Center for Advanced Extension Studies at Wisconsin.

#### FIRM GROUND IS REACHED

By the end of the Contract in 1960 the Office of Extension and Publications was on firm ground. Seven courses in educational psychology, principles of teaching, audio-visual instruction, community survey and program planning, extension methods, field practice in extension, and extension organization and administration were being offered as part of the Extension Option in Agricultural Education. Several similar courses were also being offered every summer in BAE training schools. And in addition a handbook on supervision was written to answer needs of the BAE's staff of 200 supervisors.

The Office was also actively involved in publications. Although the agreement with BAE for production of leaflets and pamphlets did not work out as well as originally anticipated, the Office participated in the preparation of twelve manuals on various phases of crop and livestock production in the Philippines for use in rural high schools. All copy for the printer was prepared by the Office staff, and seven volumes were produced partially or completely by multilith. Included were manuals relating to poultry, swine, tomato, peas and beans, *pechay*, cabbage, and onion production. A total of 530,000 multilith impressions were made for these seven volumes.

Professor Dayton found, however, that one area in particular—research—would have to be increasingly emphasized in Extension if the Office and the College were to meet their full responsibilities to the people of the Philippines. In the Final Report in 1960 he wrote:

“Extension principles, programs, and methods in the Philippines have been based upon, almost copied from, extension work in the United States. Some of this is not necessarily the best procedure under conditions here. Very little real research designed to develop a distinctly Philippine pattern of extension method and procedure has been carried on. Some specific questions are currently quite obvious.

“Research of this nature can be undertaken as soon as the extension staff is complete. This seems an appropriate function of the College for it is an institution familiar both with the methods and procedures in use and one which can maintain an objective point of view.”

### *Community Development Program*

The Office of Presidential Assistant on Community Development (PACD) was created on January 6, 1956 by Presidential Executive Order 156 to coordinate programs attacking root causes of poverty and striving for rural improvement in the Philippines. The major objectives of the program, which was initially financed by the Philippine government and the ICA, were, according to Visiting Professor R. A. Polson, the following:

1. To accelerate the development of a rural citizenry capable of improving their living standards with a minimum of help from the government;
2. To form local governments that could administer self-help programs; and
3. To serve as an example and to assist other Southeast Asian nations interested in community development.

#### THE MACHINERY IS BUILT

The administrative machinery set up to advance the community development concept consisted of organizations at all levels of government ranging from the national to the barrio. To begin with, Mr. Ramon P. Binamira was named to the position of Presidential Assistant on Community Development. Under him was a field staff of trained community development officers and workers to assist the various other levels in carrying out their objectives. An Interdepartmental Coordinating Committee on Community Development was established at the national level. This committee, which was composed of the heads of 25 governmental agencies involved in the community development concept, was primarily concerned with planning, policy formation, and coordination of jobs in the program and between agencies.

At the next level a Provincial Community Development Council was organized. The Governor of the province served as chairman and the provincial community development officer as executive secretary with senior officials from the Departments of Agriculture and Natural Resources, Health, Education, Public Works and Communications, Commerce and Industry, and Social Welfare Administration also participating.

The Municipal Community Development Councils consisted of local senior officers of these same departments with the Mayor serving as chairman. These Councils were organized in 200 of the 1,300 municipalities in the Philippines. In addition, a Municipal Community Development Team was planned for every 20 barrios. A Community Development Officer, Municipal Agriculturist, Municipal Home Demonstrator, three Community Development Workers, and a Health Unit consisting of doctor, nurse, midwife, and sanitary inspector were to make up each team.

The most important level of organization, however, was the barrio level where the community development workers would be working directly with the people and specifically with the particular Barrio Council. It was at this level that the program would either succeed or fail. The entire project was intended to foster self-government and self-help in the barrios and was designed to follow gradual steps of increasing self-sufficiency: discussion of common needs by local citizens; planning for the first self-help project chosen by the community; organization of the physical, economic, and social resources of the barrio groups, and creation of the desire to undertake further improvement projects.

#### OBJECTIVES OF COMMUNITY DEVELOPMENT

It was hoped at the national level that this program would accomplish several specific objectives at the local level including the following:

1. The development of barrio self-government,
2. An increase in the productivity and income of rural people in agriculture and other industries through self-help projects.
3. The construction of roads linking barrios with principal highways or feeder roads.
4. Better governmental services at all levels, but especially to the barrio.
5. Improved rural facilities for education, water supply, irrigation, health, sanitation, housing, and recreation.
6. Improved educational and vocational opportunities for adults in rural areas.
7. Increased awareness and understanding of laws regarding labor, tenancy, and other subjects.

8. Improvement of morale and strengthening of economic participation in the barrio.

#### LOS BAÑOS ENTERS THE PROGRAM

One of the first tasks of the Community Development Program was setting up training centers and recruiting workers to serve in the barrios. If competent people could not be found and trained properly, the \$5 million appropriated by the ICA (in addition to four technical advisers) for two years beginning in 1956 and the 10 million pesos from the Philippine government would be useless. The master plan for the program called for regional community development centers to be set up across the Philippines to train, over a period of five years, several thousand community development officers and workers, home demonstrators, agriculturalists, sanitary inspectors, and commercial agents. The knowledge and skills of these workers could then be employed to change attitudes, ideas, and habits within the barrios so that the rural communities could move forward. Here the College of Agriculture at Los Baños entered the picture.

In January 1956 Mr. Binamira visited the campus and invited the College to submit a proposal for a training program for community development workers. Before the end of the month a report was submitted to his office and accepted as a basic plan for the first training school. The committee of the College appointed by Dean Uichanco to draw up this report then began work on a subject matter outline.

Meanwhile CECA was finalizing plans for a Barrio Development Grant for the Philippines. Action was soon taken and \$35,000 was appropriated for a two and a half year period beginning March 1, 1956. Professor R. A. Polson, head of the Department of Rural Sociology at Cornell, was named to spend six months at Los Baños under the support of CECA. Professor L. D. Kelsey, who was supported jointly by CECA and the Cornell Contract, was selected to succeed Professor Polson.

By the time Professor Polson arrived in Los Baños in March, 1956, the subject matter outline for training programs was nearing completion. The next major task was recruitment of a training staff, which was accomplished in cooperation with A. A. Perpetua, Training Officer for PACD. Orientation for the staff stressed both the concept of community development and informal methods of instruction and presentation appropriate for adult students—demonstrations, small group discussions, student reaction forms, and visual aids such as flannel boards and flip charts.

#### THE FIRST COMMUNITY DEVELOPMENT SCHOOL IS HELD

Of the 330 trainees that made up the first group, 90 per cent were college graduates while the other 10 per cent had completed at least

two years each of college and work experience in related areas. Of the total trainees 209 were prospective community development workers, 66 were prospective municipal home demonstrators, 46 were selected by the BAE in preparation for municipal agriculture, and 9 were special trainees sponsored by Operation Brotherhood.

The instruction for this first Luzon Training School for Community Development Workers was undertaken by regular staff members of the College of Agriculture until the regular semester opened when additional instructors from various government agencies took over part of the teaching duties.

The basic training involved 16 weeks of primarily classroom training plus six weeks of field practice. Included in the subject matter were the following areas: the basic elements and philosophy of community development work; the history of community development (CD) work as a world-wide movement and how it developed in the Philippines; how to work through groups; demography of the barrio; social structure of the barrio; practical knowledge and skills in various community development phases including home management, road construction, food and nutrition, and health and sanitation; and communication of ideas within the barrio.

An evaluation of this part of the training program was made by the trainees. During the fourteenth week the trainees were asked to answer the question "All things considered, how would you rate the entire training school?" Fifteen per cent said excellent, 73 per cent said good, 11 per cent fair, one per cent poor, and one student very poor.

The supervised field work of the first trainee group was conducted in the barrios of the Provinces of Laguna, Batangas, Bulacan, and Pangasinan in teams of three which were usually composed of two community development workers and one BAE member. Professor Kelsey described the activities of the teams, all of whom stayed in homes in the barrios:

"The workers contacted the mayors, barrio lieutenants, school teachers, and other local leaders. After initial contacts, they started taking a survey of conditions using a prepared schedule. Since it was the rainy season, there was plenty of time to tabulate results from day to day. House-to-house interviews soon gave a good picture of local conditions and needs. This resulted in the building of blind drainage, kitchen improvement, low-cost food demonstrations, and planting and using *malungay* [a locally grown nutritious plant]. Government veterinarians and pest control officers were brought in where necessary."

Professor Kelsey added that some of the most ambitious projects undertaken in the six-week session were the formation of a credit union, 4-H Clubs, and a cooperative to help make and sell straw hats.

Following this supervised field work the trainees returned to the College for a period of evaluation and final instruction. The final sessions of the program included reports on the experiences of the various teams as well as panel discussions. Graduation ceremonies were conducted with President Magsaysay addressing the community development workers.

The graduates were hired as Municipal Community Development Officers or as barrio workers, depending on their work during the training period. In addition, 65 were employed as staff for the expanding program. The first trained workers, distributed in groups of three in 22 provinces throughout the Islands, began their jobs before the end of October.

Assessing the role of the College of Agriculture in the success of the initial program, Professor Polson said:

"The first Luzon Training School for Community Development Workers has been another pioneering venture for the College of Agriculture. Again its faculty has responded to the challenge of a new assignment and has diligently labored to prepare a new type of public servant. Although the assignment has involved the unfamiliar and the difficult, the response has been magnificent and there is every reason to be proud of the staff and the manner in which they have undertaken their duties."

#### IMPROVEMENTS ARE SUGGESTED

This praise for the Los Baños staff did not mean that no improvements could be made. Professor Polson made well over a dozen suggestions along these lines, and Professor Kelsey stated the following year that all but one of these proposals had been followed. Included in the list of recommendations were the following:

1. Adjust the staff load so that there would be less conflict with the regular College program.
2. Provide for two training schools each year.
3. Reduce the class size.
4. Increase opportunities for practicing the skills that are being taught.
5. Increase funds for instructional materials.
6. Determine the specific skills in the fields of agriculture, health, nutrition, home improvement, etc. that need to be taught before the actual sessions begin.
7. Plan a better evaluation of the program.
8. Reorganize the supervised field work to include weekly contact with each trainee team by supervisors.
9. Organize an in-service training program for barrio workers for the purpose of reinforcing the skills they have been taught and for keeping them apprised of new developments and methods that they might employ in the field.

10. Consider different selection procedures for trainees.
11. Differentiate the training of men and women since they will not always be involved in the same phases of community development.

#### COMMUNITY DEVELOPMENT MOVES FORWARD

Work on succeeding training schools began as soon as the first group had graduated. Plans were made to open eight centers in addition to Los Baños in order to locate one in or near every important dialect area in the Islands. Of the 65 graduates of the first school who were selected for further training, eight teams of five or six were set up and the men remaining were employed at Los Baños or at the Community Development headquarters in Manila. Each of the teams was eventually to take over instruction at one of the new training centers. With this in mind, the instruction program was broken down into five areas with one member of each team concentrating in one of them. The five units were Principles of Community Development and Communication; Rural Organizations and Government; Group Dynamics and Leadership; Agriculture, including forestry, road building, fisheries, etc., and Homemaking, including health and handicraft.

Meanwhile Professor Cedillo of the College and Professor Kelsey were locating the eight new centers around the country. Trips to various institutions resulted in the signing of contracts between PACD and eight agricultural schools that had agreed to administer the centers. The newly trained teams were then assigned to begin work.

The second group of trainees for the Los Baños center arrived on campus January 4, 1957 and were graduated on July 15. By that date, considering all of the community development training schools, 508 trainees had graduated. Most of the members of the second Los Baños group, however, were BAE employees because of a delay in the grading of examination papers for applicants for community development work by the Civil Service Bureau. The curriculum was similar to that of the first training school with several additional features including a seminar on "Barrio Councils" and another on "Out-of-School Youth." These and other activities provided for a greater input into the program by bringing outside citizens onto campus and by extending the training at the instruction level as well as the field work level into the community.

The third Luzon community development training period began near the end of March 1957, but differed slightly from previous schools. Barrio experience was obtained following a two-week concentrated briefing session so that funds from a grants-in-aid program of PACD that had to be committed by the end of the fiscal year could be used.

After a month of assisting staffs in the field, the trainees returned to the College for formal instruction.

#### PROBLEMS APPEAR

The Community Development program was not, however, without problems or opposition. Two major difficulties that cropped up in the first few years involved politics on the one hand and administrative organization on the other. The Cornell team, of course, avoided politics as much as possible since they considered their duties in the Philippines to be completely nonpolitical in nature. They did, however, take careful note of the political situation in the nation, particularly with regard to the Community Development program. A letter from Project Leader George Trimberger to W. F. Dickson, chief of the Agricultural Division of ICA in Manila, dated April 24, 1957, for example, mentioned that 60 Philippine Congressmen had signed a petition accusing Mr. Binamira, the Presidential Assistant, of using his position entirely for political purposes. Such political attacks were not uncommon.

Some attacks, however, questioned the entire concept of community development and the way in which the government had gone about setting it up. Professor Kelsey addressed himself to this basic issue in the Sixth Annual Report of the Cornell team:

"In order to appreciate the need for trained CD workers and to distinguish this movement from other government services, one must have a clear understanding of what CD work is in the Philippines. It has been both misunderstood and misrepresented. It is not the 'brain child' of a few long-haired public administration specialists and sociologists. It grew out of a situation. It became a partial answer to an ugly problem first faced squarely by Ramon Magsaysay as Secretary for Defense. It came into full being when President Magsaysay issued Executive Order No. 156 on January 6, 1956, creating the PACD. The President was convinced that most of the Huks were ordinary Filipino farmers who were frustrated and disgruntled. They refused longer to submit to the grinding poverty and pitiful shares they received as tenants of absentee landlords. The army began land settlement areas and private agencies began rehabilitation projects. Government services were all alerted to serve the rural areas as fully as possible.

"Soon it appeared that the specialized approach of a dozen agency programs it created after an American pattern was not enough. A new approach to an old problem was necessary. A new type of government service to fit Philippine conditions was offered. It proposed to find out what the barrio people want enough to do something about it themselves. It would foster self-help. It would use the timely technical help of existing government agencies, but do so through projects originating in the barrio. It would offer a coordinated total approach with financial help to be matched by local labor and ma-

terials. It would recognize the educational aspects of development. It was designed to promote stronger self-government. In fact, PACD was born only six days after passage of Republic Act 1408 which created the Barrio Councils. Here was the beginning of local government after centuries of authoritarian control of the barrio. The goal now became to develop responsible citizens with ability and freedom to act for themselves.

"This is not just another agency. It is a comprehensive approach to a complicated problem designed to utilize more fully the service of existing agencies. Coordination is sought not by Presidential edict, but by mutual agreement through agency representatives serving on CD Councils at provincial and municipal levels. This is the meaning of community development in the Philippines."

The Cornell group was more directly involved in the second problem, that of administrative handling, of the CD program. Both Professor Polson and Professor Kelsey recommended several changes in the memorandum of understanding between PACD and the College to clarify the role each was to play and to facilitate financial arrangements, including the acquisition of supplies and equipment. Both visiting professors felt that the College of Agriculture should be given full responsibility for the training of prospective workers with a definite budget so that planning could take place. Questions also arose over the method of appointment which had not worked well in the past. By the end of June 1958, however, these problems were being ironed out with the intention of revising the original memorandum of 1956.

#### SUPPORT FOR COMMUNITY DEVELOPMENT GROWS

Major advances were made in Community Development during the 1957-1958 academic year at Los Baños. In July 1957 the Community Development Center (CDC), a 450,000 pesos structure paid for entirely from Philippine funds, was opened. Located far enough from the center of the campus to maintain its own independence, the Center included classrooms, an auditorium, cafeteria, and dormitory space for 300 people.

Special funds were also appropriated during the year. The University of the Philippines Community Development Research Council provided 15,000 pesos for a study entitled "The Competence of Barrio Citizens to Conduct Barrio Government," 3,500 pesos for "Barrio Roads," and 10,000 pesos for "Merchandising Practices." In addition, a Small Farm and Home Tools and Equipment Project was started with funds from PACD. The project was activated on March 6, 1958 when 47,000 pesos was turned over to the College with the understanding that total support for the year would not exceed 105,000 pesos.

The main objectives of this research program were the improvement and development of small hand and animal-drawn tools that would

enable farmers to produce crops more efficiently, the aiding of barrio road construction and maintenance, and the development of improved household tools and equipment. The project was to be carried out in three phases including a survey of tools in use and the need for new tools, testing of newly-developed tools, and preparation and dissemination of new information. In-service training schools for carpenters and blacksmiths were also planned.

In spite of the fact that money for training schools was temporarily cut off because President Garcia was operating on an austerity budget in early 1958, the Community Development program continued. By the end of fiscal 1958 a total of 1,423 trainees had completed a training program at one of the centers. In addition, in-service training for government personnel began at the Community Development Center in early 1958.

By the time Professor Kelsey, who had also been serving under the Cornell Contract in the Office of Extension and Publications, left the Philippines that July, the Community Development program was well established at Los Baños and throughout the Philippines. Although no formal assistance was given to the program beyond this point, informal relations with members of the Cornell group were maintained through the various departments of the College in which they were serving.

By the end of the Cornell Contract in 1960 a total of ten training schools had been held at Los Baños. Of equally great importance, however, was the growth of the Community Development Center as a focal point for international community development. It was noted, for example, in the Final Report that between April 1, 1959 and March 31, 1960, a total of 47 parties of from one to twelve people each visited the Center for up to two months. These groups represented 16 nations including Cambodia, Thailand, Malaya, India, Nepal, Pakistan, Afghanistan, Taiwan, North Borneo, Burma, Vietnam, Ceylon, Indonesia, Korea, and Australia. There was also one group of United Nations personnel and another group represented several different countries.

Thus a program that had started out just four years earlier with a training school at Los Baños had expanded into a nation-wide movement and eventually one of international influence.

### *Local Government*

The first work in local government was conducted at Los Baños in 1957 with assistance from Visiting Professor Edward A. Lutz of Cornell. Supported entirely by CECA, Professor Lutz was appointed to serve in both the Departments of Agricultural Economics and Agricultural Education.

## WORK IN GOVERNMENT BEGINS

Professor Lutz explained how and why work in local government, which is relatively unusual in colleges of agriculture in the United States, was started at the College of Agriculture:

"Interest in its [local government's] inception, has probably arisen primarily because the Presidential Assistant on Community Development located a training center at the College approximately two years ago with the active support and cooperation of College leaders and many of its staff. In building the training program, it became clear that knowledge of local government together with its deficiencies and potentialities was important and that too little was known. The implications of this subject to other phases of College teaching also led to awareness of its potential usefulness. Since beginning the work, other events have heightened its prospects for contributing to the effectiveness of College activities."

It is doubtful whether work in rural local government would have been started at the College without support of the CECA, which had become interested in a program for strengthening local government in the Far East well over a year before Professor Lutz arrived in the Philippines. One of the first steps in the overall program was educating future leaders as well as current government personnel in the reorganization and management of local governments. Thus it was necessary to provide experts in the field to colleges of agriculture in the Far East. On April 24, 1956, Los Baños was approved as one of these sites.

A second phase of the planned program involved the strengthening of programs in the United States with special emphasis on graduate training. The CECA appropriated \$34,000 to Cornell as support for a visiting professor at Los Baños, an additional \$24,000 for a comprehensive graduate study of local government in several countries, and an additional \$12,000 a year for ten years to assist in the support of a professor of international comparative local government at Cornell. Professor Lutz was then selected to spend a year at Los Baños for the purpose of starting a program of teaching, research, and extension in local government.

To begin with, a course in Rural Government was added to the curriculum of Agricultural Education in June 1958. A course outline was prepared with the assistance of Mrs. Patrocinio Santos-Villanueva, who the year before had obtained an M.S. degree in public administration and finance at Cornell. The Curriculum Committee of the University Council at first rejected the proposal but later reconsidered and approved the course. Professor Lutz noted that although this was the only course set up during his year in the Philippines, other areas including public finance and taxation and comparative rural government

deserved consideration as research materials and additional staff became available.

#### PRACTICAL RESEARCH IS ORGANIZED

The research program undertaken by Professor Lutz and Mrs. Villanueva was primarily designed to accumulate data needed to teach rural government as an applied science in the context of Philippine life. Professor Lutz was less concerned with the study of government on a theoretical basis than on a practical one. Questions of direct relevance to rural life in the Islands needed answers. What did barrio people want strongly enough to take action themselves? Which of these things should include government involvement and which should be handled by the private sector? In what areas of life should the government leave citizens to themselves? What governmental structures would be needed to meet the goals? What part should higher government play in giving assistance, financial support, and incentives? What about taxation?

Professor Lutz wrote:

"Again answers to these questions appear to require drawing upon fields other than government, political science, public administration, or public finance as traditionally taught. The concerted contributions of other social sciences, as applied to agriculture, the individual farmer and farm family, and the rural community, may open avenues not yet conceived by people imprisoned in their own specialties.

"The approach of the College would emphasize what problems are most immediately important to farmers and rural communities, which of them can government reasonably be expected to do something about, and in what ways can and should government contribute to solutions. It is possible that these problems may concern such basic, down-to-earth things as how to make life and property physically more secure from depredations by others so that men can plan and act with greater confidence of fulfilling their plans; how men can best obtain simple and swift justice in quarrels with their neighbors, so that they may have reasonable confidence of a minimum of peace and security; how they can draw on the ideas and experience of others in simple ways through education broadly and simply conceived; how they can prevent sickness and premature death by measures within their power. . . .

"These may be simple, rudimentary needs but the question of how best to meet them is far from simple or it would have been answered more completely in the Philippines long ago. It is reasonable to expect that the College through approaches of applied science in the field of agriculture is in a unique position to make valuable contributions."

Thus, like all other areas of research work studied by the visiting pro-

fessors from Cornell, research in local government was intended to be problem oriented, to find practical answers that could be directly applied to the particular situation in the Philippines.

A major research project involved a study of the competence of barrio citizens to conduct their own government. Mr. Buenaventura M. Villanueva of the University of the Philippines' Institute of Public Administration was directly involved in surveying 60 barrios from across the nation, 59 of which were used in the study. The U.P. Community Development Research Council financed the project, which was also conducted in line with the work of the CDC. The Department of Agricultural Economics was also involved and Mr. B. Z. Bangcaya assisted in the field work.

Mrs. Villanueva headed a study devoted to barrio roads which was on the same footing as the barrio government project. Specific goals of the study were to study economic and social changes resulting from the construction of new roads, to gather information about financing and construction methods, and to obtain an indication of barrio willingness and ability to devote resources to road construction and maintenance. Early results from the study, which involved cooperative work with the Bureau of Public Highways as well as the CDC and other departments of the College, indicated that several significant changes in barrio life accompanied construction of roads. Prices of crops increased 25 to 40 per cent or more, land value went up as much as one-third to over 100 per cent, and government employees such as police and municipal agriculturists paid more frequent visits. In general, a substantial rise in income was reported.

As part of the second phase of the CECA program for strengthening local government in the Far East, Nicolaas Luykx, a graduate student at Cornell, began a study of comparative local government in Southeast Asia. In addition Mrs. Villanueva started work on a study of municipal services, organization, and finances of a municipality in the Manila metropolitan area. Professor Lutz together with Professor Sandoval and Mr. Bangcaya of the Department of Agricultural Economics also planned an analysis of local government revenues and expenditures.

The work in local government was barely beginning when it was time for Professor Lutz to leave Los Baños in July 1958. The success of this field in the College, however, was noted by CECA and, in particular, by PACD. In fact, PACD requested additional grants to support a visiting professor in the CD Center on a full-time basis. Then in 1959 the CECA authorized additional funds for a professor of rural government at Los Baños for two years—one year beyond the Cornell Contract. Professor Wells M. Allred of Utah State University accepted the assignment and arrived in the Philippines in August 1959 with support from

both the Council and the Contract. He was the last visiting professor to arrive in Los Baños under the program.

The research program in local government had advanced during the year although no direct assistance was provided. A major change had occurred in the overall outlook of the program with the passage of Republic Act 2370, which gave greater independence to barrio governments. The staff of the College working in rural government areas were directly involved in preparing suggestions for the national government which eventually led to this Act. Need for greater involvement of the College in the study of local government increased enormously with passage of the Act, and the research program reflected this need.

For example, Mr. Bangcaya was engaged in a project to determine what possible taxable resources and revenues were available to barrios if the taxing powers authorized by Republic Act 2370 were utilized. He also undertook a pilot study tracing causes of tax delinquency. Professor Allred joined with Mrs. Villanueva in a study involving demonstration and evaluation of how the barrio autonomy law could best be implemented. These and other projects were still active when the Cornell Contract came to an end in June 1960.

Much remained to be done, as Professor Allred noted in the Final Report. Resident instruction in this area needed to be strengthened. Local government financing, property assessment techniques, accounting and budgeting, community planning, and descriptive studies of the structure and functioning of local governments in relation to each other and to the national government all required research. Full-time employees were needed to implement the teaching and research programs in local government and greater outside contact was needed. Professor Allred said with regard to extension:

"It is probable that seminars and short courses could be provided in collaboration with other groups such as the Presidential Assistant on Community Development, the extension service, and other agencies working in local government. When sufficient resources are available the College could well justify the sponsoring of some schools, courses, and seminars on subjects related to local government and agricultural development both on campus and in the provinces."

#### THE NEED FOR CHANGED ATTITUDES

More basic to the success or failure of the College's efforts in local government—and indeed to the success or failure of the nation's attempts at organizing rural governments—was the need for a change in attitude on the part of most rural Filipinos. Professor Lutz stated it this way:

"There are many, many traditional attitudes and cultural characteristics in the Philippine society that hamper the effectiveness of large

scale organizations (i.e., the government). Among them are: (1) strong ties to family and community compared with those to the larger society; (2) limited faith and trust in people beyond this circle; (3) very limited formal education...; (4) limited communication and transportation facilities; (5) a tendency for the well educated to regard 'the masses' as ignorant, stupid, and lazy; (6) limited understanding of the application of science to everyday life; (7) reluctance of people who can avoid it to live in 'the provinces'; (8) the tendency of many to regard a government position as a privilege and a kind of pension; and (9) an attitude of dependence on 'The Government' for taking care of local and personal problems, great and small."

Clearly the College would have to undertake the task of educating the barrio people in the values of local government as opposed to many traditional ways of barrio life. The first step had been taken at Los Baños, and hopefully additional steps would be taken in the future.

### *College of Forestry Contract*

In the summer of 1955, at the request of University Controller Peterson and Dean Myers, Cedric H. Guise, Professor of Forestry, Emeritus, traveled to Los Baños to examine the possibilities for a technical assistance contract between Cornell and the College of Forestry of the University of the Philippines. Dr. Guise's report, "An Examination and Appraisal of the Status and Needs of the College of Forestry, University of the Philippines," submitted on August 15, 1955, recommended that plans for obtaining FOA (which had since become ICA) funds be carried through and that experts in forest products, silviculture, and forest economics be sent to Los Baños. Negotiations proceeded and a contract for ICA-NEC assistance between the University of the Philippines, College of Forestry, and the College of Agriculture at Cornell went into effect April 25, 1957.

### FORESTRY AT LOS BAÑOS

Forestry courses were first taught at Los Baños in 1910 when a two-year program for training forest rangers was instituted within the College of Agriculture. In 1916 the School of Forestry was separated from the College and the Director of the Bureau of Forestry was named ex-officio Dean by law. A three-year course leading to a Bachelor of Science degree in Forestry was added to the curriculum in 1922 and extended to a full four-year program in 1930 when the special two-year ranger program was abolished. The basic structure of the curriculum remained the same, however, with Bureau of Forestry personnel doing much of the instruction, until the School was closed during World War II. In the fall of 1945 when the School was reopened—for only 11 students—the two-year ranger program was reinstated.

The School of Forestry had been physically devastated by the war. All but the main building had been destroyed. The experimental forest area, most of the records, and the entire library were gone. Although little money was immediately available for any repairs or reconstruction, teaching resumed. In 1949 the School became officially the College of Forestry, and 1951 saw the rebuilding of a mess hall and dormitories. In 1952 the woodshop building was replaced, but not until a decade after the end of the War was the main building rehabilitated with ICA-PHILCUSA money.

A Forest Products Laboratory and a Forest Experiment Station had opened at Los Baños just a few months before Professor Guise's arrival in 1955. Both of these buildings were operated directly by the Bureau of Forestry. The College of Forestry itself was run jointly by the Bureau and the University of the Philippines. The cumbersome administrative structure was further complicated by the fact that many Bureau of Forestry personnel working on the College campus were considered members of the faculty, but faculty members of the University at the College of Forestry were not members of the Bureau. The situation was further confused when in 1952 Mt. Makiling National Park, which had been under control of the Bureau, was placed under the Commission of Parks and Wildlife. Soon afterward the Commission became the Office of Parks and Wildlife, thus entirely separating it from the Bureau of Forestry. Until that time Mt. Makiling Park had been open to the College for its use. Now the College of Forestry, in effect, had no forest.

Professor Guise also reported that in the Philippines the situation of the forests was critical, largely because of poor government administration of a homesteading act. Fires, over-cutting in some areas, and poor logging practices in general had all contributed to devastation of the forests, but the greatest problem seemed to be "squatters." These squatters would follow a logging operation, squat on the land near the roads the loggers had to build, cut down the remaining trees, clear the land, grow two or three crops, and then move on to another area, abandoning the land. Guise noted that no forest official could buck members of Congress who would call the Philippine Forest Service and tell them to release new land on which squatters wanted to settle, although land was supposed to be examined and then released only if found suitable for permanent farming.

#### RECOMMENDATIONS FOR ACTION

The implications were clear. "The Bureau of Forestry is active in administering the forests, but its personnel is too limited in number to handle adequately the many problems of immediate concern," Guise stated. More trained personnel were needed and an expanded research

program was vital if the Philippine forests were to be saved. And these priorities could be met only if the nation's only College of Forestry was equipped to supply the men and the knowledge.

The aims of the College of Forestry had always been high: training administrators in the intelligent use of the Philippines' forest reserves; reclamation and reforestation of grasslands and barren, nonagricultural lands; conducting research necessary for improved management, protection, and use of the forests and forest products; setting a high standard of forestry education in the Orient; and serving as a central agency for disseminating information about forestry. Yet Professor Guise noted major inadequacies in the College that hindered progress toward these goals.

First of all, the majority of students would spend only two years at the College of Forestry and then leave with Ranger's Certificates; not enough emphasis was given to the four-year degree program. Second, the staff of 24, with 19 of them teaching forestry and pre-forestry subjects, was too overburdened by the teaching load of nearly 500 students to accomplish much in the laboratory. Third, the budget of 50,000 pesos per year for all major expenses was woefully insufficient.

Professor Guise therefore concluded his report with the following specific recommendations: (1) the number of students should be reduced and the number of faculty increased; (2) more money should be appropriated; (3) the administrative organization under which the College was jointly run by the Bureau of Forestry and the University of the Philippines should be restructured; (4) greater emphasis on extension was needed; (5) less emphasis should be given to the ranger certification program; and (6) work should proceed toward completing arrangements with ICA for funds and Cornell for visiting personnel.

#### THE CONTRACT AND THE FIRST VISITING PROFESSORS

The Contract between the two universities that resulted was interpreted by both as a first step toward strengthening the College of Forestry and providing services in both education and research essential to the Philippines. Specific provisions of the agreement were intended

"to provide means, outline procedures, and assign responsibilities to the contracting parties for the purpose of:

1. Modernizing the curriculum.
2. Improving teaching methods.
3. Planning and carrying out a policy designed to give increased emphasis to the professional degree course.
4. Stimulating research."

Visiting professors were to train local faculty members by giving advice and assisting in teaching exercises and by conducting research.

In addition, advice in organizational, administrative, and cooperative matters was specifically requested. Help in building up the library, preparing extension materials, and acquiring laboratory and teaching equipment were also deemed essential.

Since there is no College of Forestry at Cornell, an arrangement was worked out whereby visiting professors for assignment at Los Baños were borrowed from the State University of New York College of Forestry at Syracuse University. The first two professors from Syracuse, Dr. Richard E. Pentoney, Forest Products, and Dr. C. Eugene Farnsworth, Silviculture, arrived in September, 1957, and found the situation at the College of Forestry changed considerably from what Professor Guise had reported two years before. The rehabilitation of buildings had continued, and total floor space was equal to what it had been in prewar years. Unfortunately only one-third of the laboratory space and two-thirds of the dormitory space had been restored.

A major change had also taken place in the administration. Under General Administrative Order No. 1, Series of 1957, the Secretary of the DANR had directed that the University of the Philippines should assume full control of the College. In addition, Executive Order No. 257 that same year combined the Forest Products Laboratory and the Forest Products Research section of the Bureau of Forestry to form the Forest Products Research Institute and placed policy matters of the new organization under the University of the Philippines. Although these administrative moves greatly improved the organization of the College of Forestry, no steps were taken to replace the faculty members that had been supported by the Bureau of Forestry. More than one-half of the College teaching staff had thus been lost; seven professors and instructors left the College and five professors were assigned to the Forest Products Research Institute for full-time work. Although student enrollment had declined since 1955, the teaching load per instructor had increased.

Destruction of the forest resources, however, had continued. Both visiting professors believed that the forests were in danger of liquidation, and noted as an example that 62.7 per cent of the land area of Cebu had lost three-fourths or more of its original topsoil by erosion. The Philippine economy which depended on forest products as the nation's third largest money producer, contributing over \$50 million a year in exports, might soon begin feeling the effects of such devastation. Both professors hoped that their efforts at the College of Forestry would in some way help improve these conditions.

#### THE FIRST YEAR'S ACHIEVEMENTS

Major achievements during that first year of the contract, which also saw Dean Gregorio Zamuco replacing retiring Dean Calixta Mabesa,

included initiation of several substantial research projects, drawing up of a comprehensive rehabilitation program for the College, faculty approval of a revised curriculum, and overseas training of College personnel.

Two major research projects involving residual tree study plots and root pruning of tree seedlings were undertaken with the Bureau of Forestry. Both the Bureau and the College benefited from these cooperative arrangements since the former could contribute land in the absence of a College forest and the latter research funds. The College of Forestry also conducted studies and experiments related to storage and germination characteristics of tree seeds, financial management of *ipil-ipil*, and the shear properties of Philippines woods.

A ten-year rehabilitation plan for the College of Forestry was prepared. Included in the plan were repair of war damage and an increase in the physical plant, an increase in the faculty, expansion of library and research facilities, acquisition of Makiling National Park as the College forest, and revision of the curriculum. Steps were taken toward all these goals, but plans for curriculum changes advanced the furthest. Basically, the new plan called for a separate two-year Ranger program and two distinct majors within the four-year program, one called Forest Production which would include silviculture, watershed management, and logging engineering and the other Forest Products.

Just as provisions for the overseas training of staff had been included in the Cornell Contract with the College of Agriculture, an essential part of the College of Forestry Contract was inclusion of personnel training. The Contract called for two men to spend a year of study overseas during each of the three years of the Contract. While expansion of the faculty was considered by the visiting professors to be the most important part of the program, great significance was also attached to providing opportunities for further education on the part of the staff. In their First Report, Professors Pentoney and Farnsworth pointed out that only one faculty member held a Ph.D. while two held Master's degrees. Eleven others had achieved Bachelor's degrees. The first two instructors returned from advanced training at the State University College of Forestry at Syracuse in September 1958.

Recommendations by the visiting professors following their first year in the Philippines included increasing the College faculty by seven during fiscal year 1958-1959 and by 12 during fiscal 1959-1960; putting the revised curriculum into effect as soon as possible after its approval by the University Curriculum Committee; working toward a student-teacher ratio of 10:1 with each faculty member devoting at least one-third of his time to research; and moving forward with plans for the assistance contract renewal in 1960. In addition, wholehearted support was given to the 10-year rehabilitation plan.

Professor Earl L. Stone of Cornell University became the third visiting professor as a specialist in forest soils and watershed management in September 1958. Both Professors Pentoney and Farnsworth returned to Syracuse early in 1959, but Professor Carl de Zeeuw, also from the College of Forestry at Syracuse University, joined the Los Baños staff to assist in Wood Technology.

The second year of the Contract saw several new research projects undertaken. In particular, with the cooperation of the Bureau of Forestry, experiments concerning the effects of thinning on wood quality were begun. For the first time in the Philippines, research on silvicultural techniques and treatments needed to improve the growing stock on selectively logged areas was conducted. Cooperation was also obtained from several logging companies, and 35 sample plots were established with their assistance.

The teaching activities of the visiting professors included a series of 20 lectures to personnel from the Forest Products Research Institute. A manual covering the topic of elasticity of wood and plywood was prepared in connection with these lectures. Another manual in wood physics was also prepared, and a course outline in forest tree seeds was started. The visiting professors also gave instruction to Community Development trainees. In addition, a special seminar in research methods for seniors and faculty members was offered.

One of the major problems Contract personnel had to face was lack of sufficient textbooks and references. Although preparation of course outlines and manuals helped ease the situation slightly, the greatest help came in the form of a \$10,000 grant for the purchase of library materials over a two-year period. This support from the Rockefeller Foundation enabled the College of Forestry to acquire 1,275 volumes during the second year of the assistance contract.

Two additional trainees left for advanced study in the United States during the year and several new members were added to the College staff. The University Curriculum Committee finally approved the proposed curriculum revisions on April 1, 1959 with implementation slated for the following school year. The government also appropriated 50,000 pesos for scholarships for forestry students beginning in 1960.

Recommendations by Visiting Professors de Zeeuw and Stone and Project Leader Halsey Knapp included the following: increasing efforts in student recruitment and counseling; making purchasing procedures for supplies and equipment more flexible; increasing clerical and stenographic assistance; naming a senior faculty member to be responsible for handling routine business and administration; and increasing faculty participation in college affairs and planning so that Dean Zamuco would have sufficient time to devote to budget and policy matters, planning, and representation of the College both in the

University and in national forestry affairs; delegating greater responsibility to faculty committees; and establishing a vigorous forestry information service.

In July 1959 Professor Charles Larson, Forest Economics, joined his Syracuse colleagues at Los Baños as the last Visiting Professor under the Cornell Contract. The final year of the program was largely spent in negotiations for the new contract with Syracuse; implementation of the revised curriculum; continued cooperative research, primarily with the Bureau of Forestry; and further training and expansion of the College staff.

Several significant improvements were made during the three-year Contract between Cornell and the College of Forestry, and, perhaps more importantly, a solid foundation for work to be undertaken by Syracuse during the next five years was laid.

Equipment and supplies valued at \$70,000 had arrived in Los Baños, and the physical plant had seen several major changes and additions. The nontechnical staff at the College had increased from seven to 23; the teaching staff was raised from 15 to 24 with six instructors—five at the College of Forestry at Syracuse University and one at the University of Michigan—receiving advanced training. A total of \$195,000 had been appropriated through ICA with an additional 313,000 pesos coming from NEC.

#### ARRANGEMENTS WITH SYRACUSE BEYOND 1960

At the request of Dean Zamuco negotiations were begun toward continuing the assistance program to the College of Forestry beyond 1960. During the year the Cornell Contract was extended from the original April ending date to June so that both the College of Forestry and College of Agriculture Contracts would end simultaneously. It was agreed, however, that any further assistance to the College of Forestry should be handled through a contract with the College of Forestry and the State University of New York. The National Economic Council recommended on April 10, 1959, that the program be continued in that manner, and plans for a new three-year contract were made. Difficulties arose over financing the contract, but in June ICA-Manila approved organizing the program around the rehabilitation plan with eight visiting professors and fifteen overseas participants involved.

The new Technical Assistance Contract between the University of Philippines, College of Forestry, and the State University of New York College of Forestry at Syracuse University was signed just five days before the original Contract with Cornell was to expire. The change-over was far from abrupt. The new visiting professors, as well as the staff of the College of Forestry, continued the work begun in 1957,

following the recommendations of the Cornell group while gradually branching out into new areas of research and teaching.

It was not until August 1960 that one of the more tangible results of the Cornell effort was realized; two months after the first phase ended the Makiling National Park was turned over to the University of the Philippines for the exclusive use of the College of Forestry.

Assistance under the new Contract between the SUNY College of Forestry and the U.P. College of Forestry continued until June 30, 1965 when the program was terminated.

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## CHAPTER IV

# Highlights of Accomplishments

### *Development of Physical Facilities and Equipment*

To separate contributions of the ICA, PHILCUSA, and various foundations to development of the physical plant and equipment of the College of Agriculture is very difficult. Many of the major construction projects supported by aid from these and other agencies were begun before the signing of the Cornell-Los Baños Contract, although many were not finished until after the first visiting professors arrived. By 1955, though, most of the major reconstruction was completed, 45 projects in all, including 13 major buildings, 25 minor structures, and seven major repair projects.

Major construction projects included: 19 faculty houses—six large, 12 small, and one guest house—the Library, Agronomy Building, Girls' Dormitory; Granary and Drier Building, Farm Machinery Building, Agricultural Economics Building, Swine Husbandry Building, Home Technology Building, Soils Technology Building, Agricultural Engineering Building, Service Division Shop, and Farm Services Building. The total cost of materials and labor amounted to 1,598,510 pesos.

Minor projects were: Insectarium, Feed Processing Plant, completion of the Dairy Building, Power Plant Building, screen houses, lysimeter, cattle-carabao barn, Isolation and Quarantine Building, Maternity calf barn, two glasshouses for Plant Pathology, Feed Barn, Pathologium, a student bungalow, Botany greenhouse, Soils drying shed, two poultry houses, culverts, battery cages for poultry, practice house, eight poultry shelters, livestock corrals, cattle chute, concrete tank, and wire cages. The total cost was 251,168 pesos.

The repair projects, which cost 151,577 pesos, included repair and asphaltting of roads, repair of the two campus bridges, repair of water lines, repair of the Agricultural Engineering Building, the re-wiring of power lines, and installation of a drainage system for the dairy compound.

The grand total cost for construction and repair was 2,001,255 pesos. In addition, an electrical distribution system was installed at a cost of 383,700 pesos, including the cost of the Power Plant Building. A water system was also installed at a cost of 401,579 pesos.

Between January 1956 and June 1960 several other major construction and many minor building projects were either completed or underway. For example, during the 1956-1957 academic year the Community Development Center, an insecticide testing laboratory, and two wings for the Farm Machinery Building were constructed. Renovation of offices, classrooms, and laboratories was common. The addition of the Agricultural Credit and Cooperatives Institute and the completion of plans for the International Rice Research Institute were major achievements in the later period of assistance.

Equipment needs of the College were far from met when the Contract ended, but, unlike conditions when the first group of Cornell professors arrived in 1952, all departments had sufficient supplies, machinery, and apparatus.

It would be impractical to list all equipment purchased under the Contract, donated, bought with grant-in-aid funds, or purchased with ICA allocations. Perhaps the best indication of the value of this support was the amount of research conducted at Los Baños by 1960. A few examples indicate the scope of a long list.

Without refrigeration and collection equipment the artificial insemination program would have been impossible. Research in Agricultural Economics could not have been attempted without proper office equipment, calculators, and other specialized machines. Printing and publications operations of the Office of Extension and Publications could not have been started without the mimeographing and multilithing machinery. Entomology required equipment for insecticide studies. Plant Breeding, Horticulture, and Vegetable Crops depended on farm machinery for their research programs. All departments in the biological sciences required laboratory equipment for their research and teaching.

### *Development of the College Library and Textbooks*

At the end of World War II, the College of Agriculture Library that had contained over 20,000 books in 1941 was reduced to 180 volumes. Most of these escaped destruction because they were in the homes of faculty members whose houses were not destroyed. In addition to the loss of books must be added that of over 6,000 pamphlets and 500 scientific journals.

Soon after the end of the War, however, work began on a new library. Operations Mission supplied much of the money needed for equipment, supplies, books, and journals, as well as over \$29,000 for a new building, and the Rockefeller Foundation later provided \$10,000 for books.

In March 1955 the new library building, constructed at a cost of 315,510 pesos, was opened. By June it contained 12,986 books, 993

pamphlets, 635 thesis manuscripts, 50,434 periodicals and serials, 46 maps, and 10 microfilm strips. Up to that time only about one per cent of the books in the library were purchased through Cornell funds under the Contract. PHILCUSA-ICA money accounted for nearly half of the acquisitions with 28 per cent from donations and 26 per cent from the University Book Fund.

By the end of the Contract period substantial gains had been made in the library's materials, as Table 2 clearly shows.

TABLE 2. Gains in Materials, College of Agriculture Library, 1952-1960

Years	1952	1960
Books .....	5,625	22,322
Pamphlets .....	930	1,382
Thesis manuscripts .....	315	1,305
Periodicals (issues).....	32,723	86,396
Maps and charts.....	2	132
Motion pictures and films .....	1	27
Microcards.....	—	222

Although improvement was considerable, as the Cornell group noted in the Final Report, additional materials would be needed by the time the College's expanded graduate program was initiated.

That many students did not own their own textbooks and therefore had to rely on the library constituted a major problem. Furthermore many of the available texts did not relate to Philippine agriculture and conditions. To help solve these problems some of the visiting professors and departmental staffs prepared mimeographed texts, syllabi, and outlines.

One of the first departments of the College to provide students with text material related to the Philippines was the Department of Botany. By 1956 mimeographed materials for the course in plant physiology had been organized and were being sold at the College "Co-op" for cost. By the following year course outlines and additional mimeographed materials had been prepared and made available for student use in several other courses. By mid-1958 the following additional texts and outlines were available: a 250-page book on "Marketing Farm Products in the Philippines," an illustrated lecture outline for a new course in Veterinary Entomology, an illustrated General Botany Lecture Syllabus, Part I, and a manuscript "A Synopsis of Photosynthesis."

The Office of Extension and Publications contributed to the growth of this program by supplying multilith and mimeograph services. Other materials including bulletins and pamphlets were put out by the Publications Office or in cooperation with government agencies to improve instruction.

Even though progress was made in the development of appropriate instruction materials, this remained a limiting factor to successful undergraduate teaching at the termination of the Program in 1960. A similar problem with the rural high schools, however, had been partly alleviated by production of 12 vocational manuals at the College. This had required special financial assistance and the employment of several writers. A similar approach was not practical for college-level needs, however. The Cornell group, though, did suggest that time be made available to qualified staff members for the production of textbooks:

"Such books would be an important contribution to the agriculture of the nation, as well as to the education of students at the College. It is one of the greatest present needs and would seem almost an obligation of the College...."

"The preparation of a book should be regarded as a major accomplishment and individuals responsible for good textbooks should receive rewards in the form of personal recognition and increased prestige, as well as any more tangible form of reward that may be possible."

### *The Central Experiment Station and Problem-Solving Research*

An Experiment Station was established at Los Baños in 1918 by the Philippine legislature and was provided with a grant of 125,000 pesos to begin operations. Unfortunately, no further support was forthcoming from the government before World War II, and the potential of the station was not realized. The lands of the station were maintained by the Department of Agronomy up until 1950 when, following the recommendations of the Bell Mission, it was officially recognized as the Central Experiment Station and, as such, the center of research in agriculture for the Philippines.

Little could be done with the Experiment Station lands in the first year of the project, primarily because of lack of money and equipment. By the end of the second year, however, the Cornell visiting professors with the assistance of the local staff conducted a comprehensive survey of the land, facilities, and management of the Station and presented a report to Dean Uichanco.

Several major problems that had to be corrected before extensive research work could be conducted at the Station were discussed, including the following: lack of surface drainage; haphazard use of land within a field; failure to employ crop rotation and green manuring; absence of effective weed control; inadequate fencing; poorly maintained pasture lands; failure to give experimental plantings first priority in the use of farm machinery; and the absence of permanent

records on land use. The latter situation resulted largely from the practice of parceling land for use by departments and individuals without any coordination for the College as a whole.

In addition to presenting plans for correcting these problems, the Cornell group also suggested that changes be made in the administration of the Central Experiment Station. First, they proposed that an office of Superintendent for the Station be created. The Superintendent would function independently of any department of the College and would be responsible for all field machinery, management of land not being used for research at any given time, keeping of land-use records, supervision of the installation of drainage and fencing systems, and consultation regarding the planning of research work. Second, they recommended that an Experiment Station Committee composed of the Superintendent and representatives from all departments and divisions involved in field experiment station research be created. The committee would be responsible for planning an overall long-term land use and management program, allotting research areas to the various departments, advising and consulting with the Superintendent about the research program, and holding regular meetings to discuss problems.

Work on some of these problems was already underway when the report was finished. Professor A. M. Goodman, Agricultural Engineering, had already surveyed the Experiment Station grounds and completed a topographic map of the area. He had also mapped out an open ditch drainage system, and construction began under his successor, Professor Paul Hoff, when a special research fund from the government was released.

This special research money marked an achievement for the Central Experiment Station, as did the appointment of Professor A. B. Catambay of the College as farm superintendent. For the first time since 1918 money was directed from the government to agricultural research at the College. An appropriation of 200,000 pesos was provided for creation of new research positions, a move which enabled the doubling of the staff available for research duties. Unfortunately in the years to come, the appropriations to the Station, like those to the College in general, were not increased or even maintained at the same level, and it became necessary to rely more on grants than the visiting professors considered wise.

Nonetheless, progress toward implementing the 1954 recommendations continued during the following two years. Proper drainage was installed; fields were more rationally used for experiments by various departments; improved irrigation for the dry season was made available; and pasture lands were improved.

In 1956 the Farm Management Division of the Central Experiment

Station was created. Several services placed under the supervision of this division included maintenance of about 220 hectares of crop land of which small plot experiments occupied about three-fifths while the rest was used for pasture and to produce feed for experimental stock and draft animals. The total area was divided into 150 units of land which were usually further divided into separate experimental areas. Each subdivision in turn frequently required different cultural operations which greatly increased the work of the division.

The Farm Management Division was also responsible for maintaining 25 hectares of lawns and roadsides on the campus; maintaining fences, roads, and ditches at the Central Experiment Station; holding farm practice classes; and providing mechanized and animal-drawn equipment for clearing, excavation, leveling, and drainage as well as for field investigations.

Professor R. B. Musgrave, who served in the Divisions of Farm Crops and Plant Breeding of the Department of Agronomy starting in July 1957, also spent considerable time working with the Division of Farm Management. He contributed to a study of problems within the Division soon after arriving and concluded that improvement of the amount and quality of services rendered depended on simplifying land preparation methods, increasing the labor force—particularly tractor operators, providing maintenance facilities to make emergency equipment repairs and to reduce the number of breakdowns, and making adjustments in the kinds of equipment being used. Much of his time was spent in seeing that changes in equipment were made and in demonstrating better methods of using the equipment available.

Professor H. A. MacDonald, Professor Musgrave's replacement, also assisted the Farm Management Division in much the same way. The unwieldy multiple jobs of the Division, however, seemed to create many problems and Professor MacDonald stated that:

"The management and maintenance of the Central Experiment Station as now organized presents many acute problems. The task of administering, planning, and programming such a set-up requires informed, intelligent, and decisive action. The ever pressing problems of land use, rotations, soil management, timely operation, irrigation, weed control, and field sanitation as well as record keeping are immense. No individual or single group can do this adequately and at the same time be a general service unit, an instruction body, and a campus clean-up crew. Under such an organization research suffers and truth is lost."

Professor MacDonald suggested that to give some duties of the Farm Management Division to other departments and divisions of the College would answer some of these problems. In particular, he suggested that the Agronomy Department take over weed control, that maintenance of the campus and the grounds be turned over to a new

Division of Buildings and Grounds, and that an administrative committee be set up to assist in managing the Experiment Station. Professor G. Fred Somers, who assisted the administration of the College and the Central Experiment Station from November 1958 to November 1959, also noted these problems and suggested similar solutions.

During the course of the Contract, however, major improvements in the Central Experiment Station and research program in general were made. The two areas cannot be separated easily; although most of the research at the College was conducted within the framework of the various departments, that research was largely conducted on the lands of the Experiment Station which were maintained by Station personnel. Changes in the Station program affected the research within the College of Agriculture, and vice versa.

Attitudes toward and the organization of research had changed considerably over the eight years of assistance. When the Contract was signed emphasis was given in most departments to undergraduate thesis research. These studies seldom contributed information of value and comprised short-term, unverified experiments. The time that had to be spent teaching and working with students on thesis problems, furthermore, contributed to lack of comprehensive faculty research, as, of course, did lack of equipment and facilities.

As the visiting professors became acquainted with the College and as needed equipment and supplies began arriving at Los Baños, a change in research was soon seen. As early as the 1953-1954 academic year the College was being urged to promote commercial sponsorship of research and to conduct experiments on private farms in areas where the soil and the climate differed from those of Los Baños.

This change in research concentration was pointed out in the Third Annual Report in 1955:

"Productive research is research with a purpose. We [the Cornell group] believe that the total research effort would be greatly strengthened by systematic and long-range appraisal of the problems of Philippine agriculture, department by department, followed by development of long-range research programs to solve these problems. Plans of this kind, while they cannot be inflexible and must be modified frequently, serve to orient the thinking of the research staff in terms of the basic problems of agriculture and the responsibilities of the Institution. In Experiment Station projects, emphasis should be placed on practical applications rather than on fundamental research, at least for the present."

The Cornell group also urged that project outlines be formulated for each project and that yearly reports of progress and of work for the following year be drawn up. Better budgeting of funds would thus be possible. Emphasis was also placed on communicating research results to the public.

In the Preface to the Fifth Annual Report of the project, Halsey Knapp, who became Project Leader in mid-1957, noted that the need for problem-solving research had been instilled in the College personnel by citing some of the major accomplishments of the program:

"Research results, accomplished cooperatively by Filipino and American staff members at the College, have led to improved crop seeds, poultry and livestock breeds, more productive methods of field cultivation and livestock management, more accurate determination of fertilizer requirements of different crops, better livestock and poultry feeds, more effective control of destructive crop and livestock pests and diseases, improved farm mechanization, irrigation and drainage, and many other contributions."

By this time annual reports had become standard procedure in most departments of the College, and the research work in general was following a trend toward coordination with the testing being undertaken by various bureaus of the DANR. In addition, the Research Committee of the College had started the practice of reviewing all planned research projects and weeding out those that would have limited value for the immediate needs of Philippine agriculture.

At the end of the Contract period several problems—the dependence on outside funds, the tendency of some professors to grow crops for commercial rather than research reasons, and simple lack of interest on the part of others—remained to be solved. But a great deal of progress had been achieved in the Central Experiment Station and the research program of the College in general. Several significant changes from 1952 to 1960 can be noted:

1. Improvement of the physical facilities, equipment, and land conditions needed for research.
2. Organized parceling of land by the Central Experiment Station and introduction by the administration of accurate records of land use and crop rotation.
3. Employment of research professors and staff directly connected to the Central Experiment Station—with research as their major duty—in addition to professors engaged in teaching, extension, and research in the departments of the College.
4. Emphasis on problem-solving research of practical value to Philippine agriculture.
5. Realization that problem-solving research required conducting research not only on Central Experiment Station lands but also on farms and DANR facilities throughout the Philippines.
6. Growth in coordination and cooperation with various government bureaus.

### *Overseas Training and Staff Development*

By 1960 a total of 74 members of the College of Agriculture staff had received training or were still abroad seeking advanced training

under the auspices of the ICA-NEC, the Rockefeller Foundation, or the CECA. These Filipinos, all of whom had studied in the United States at various universities for at least 11 months, were still serving on the faculty. Two others who had received training during the eight years of the Contract had resigned. A considerable number of others, of course, had obtained advanced training through assistantships, their own financial resources, or from different fellowship programs. The vast majority of these Filipinos obtained graduate degrees while abroad (Appendix C).

In the early days of the Cornell-Los Baños Program, according to Dean Myers, there was considerable disagreement between Cornell and the MSA over exactly what role overseas training should play in the program. The MSA in Washington had been emphasizing short-term non-degree training of two or three months when the Contract went into effect. Dean Myers described the situation as follows:

“Their attitude was to send them abroad, give them some training, and bring them back in a hurry. Well, many of the men sent on these short trips got some nice sight-seeing experience, but not much basic training. Then, to make matters worse, just after we had signed the Contract an order came from Washington that they were not going to sponsor any more scholarships for formal graduate training.

“I think they were unfairly critical of the fact that it took a year or 18 months to get a Master’s degree. The only way to be sure that a man is doing a reasonably good job and getting the necessary scientific training is to have some measure of performance. And the attainment of a degree is a measure of performance—one that’s recognized all over the world.”

Since the Cornell group felt that their major task in the Philippines was to make their own work unnecessary by training local personnel to do the job, the importance of advanced degree training was obvious. Fortunately for the College, Dean Myers spent several days in Washington and was able to get the order restricting overseas study revised. “It didn’t make any sense,” he said, “to outlaw fellowships to train Filipinos to take over when our men came home.”

Of great value to the training program was support from various foundations—particularly the Rockefeller Foundation and the CECA—that allowed many more faculty members to study in the United States. In many cases where support for obtaining a Master’s degree was initially provided by the Contract or government agencies, the CECA or Rockefeller Foundation later sponsored the most highly qualified individuals for Ph.D. study.

Although the ICA and NEC were cooperative for the most part in granting extensions beyond twelve months for staff members needing time to complete degree requirements, the problem of thesis work relevant to the tropical climate and conditions of the Philippines re-

mained. To help reduce the number of extensions and to interest graduate students in studies relevant to the Islands, it was decided to allow staff members to do their thesis research in the Philippines under the guidance of the visiting professors before or after having spent a year of course study overseas. In the final years of the Contract, emphasis was placed on having the trainees complete the research before leaving for the United States. This plan proved valuable both in terms of experience for the staff and for Philippine agriculture.

The overall value of this advanced training is perhaps best illustrated by opinions of members of the Los Baños staff who participated in the program. As the project at the College was drawing to a close, a questionnaire was given to 56 trainees. Fifty-five responded with their judgments of the program.

Of these 55, ICA-NEC funds supported 40 and the others were sponsored by the Rockefeller Foundation, the CECA, and other fellowships. Forty-four were graduates of the College, and 43 were in their twenties at time of departure. Twenty-eight of the 55 were enrolled for graduate study at Cornell University; seven studied at the University of Wisconsin. The others were divided among 10 additional U.S. universities. Upon returning to the Philippines 41 had obtained Master's degrees; five had earned Ph.D.'s.

TABLE 3. Rank held by Trainees before and after Training Abroad, Cornell-ICA-U.P. College of Agriculture Contract, 1953-1960

Rank	All 55 Trainees		Those who have been back 18 months or longer	
	Before going abroad	March 1960	Before going abroad	March 1960
Research Assistant .....	5	1	2	—
Assistant Instructor .....	23	10	7	1
Instructor (or Research Instructor) ..	20	33	16	20
Assistant Professor .....	5	8	1	4
Associate Professor .....	—	—	—	—
Professor (or Res. Professor) .....	—	—	—	—
Non-academic rank .....	2	2	1	1
Not employed by college .....	—	1	—	1
Total .....	55	55	27	27

A large percentage of the trainees advanced in rank after returning to Los Baños (See Table 3), especially those who had been back at the College for at least a year and a half. Only two of the trainees were not involved in teaching and research both before and after their overseas training. Seven who had no responsibilities in administration before leaving, however, added that to their duties upon returning.

In line with this change in administrative roles were the answers of trainees regarding salaries, responsibilities, and service to the Philippine society as a whole (See Table 4).

TABLE 4. Opinions of Trainees Regarding the Relationship of their Going Abroad and Salary, Responsibility, and Service, Cornell-ICA-UP College of Agriculture Contract, 1953-1960

Possible change in position	Do you believe that because of going abroad for university training your present position with respect to the following is:		
	Salary	Responsibility	Service to your society
More .....	36	47	37
Less .....	7	1	2
Same .....	4	2	7
No Opinion .....	8	5	9
Total .....	55	55	55

Thirty-six of the 55 reported that they had received an increase in salary; 47 felt they had greater responsibilities in 1960 than they had had before going abroad; 37 felt that they were performing a larger service to society following the advanced training.

With regard to the value of the training itself in terms of increasing their knowledge and improving their work, 48 of the trainees replied that the training had contributed substantially to their competence in their major fields. Forty-four replied that they were utilizing their training in a technical sense; eight qualified their replies, and only three answered in the negative.

When asked, "How could the university you attended abroad have made the training you received more useful to you?" eighteen of the trainees answered that they had found the training satisfactory or very satisfactory and that they had no suggestions. The most frequent recommendation called for extending the overseas stay to allow for more university study (See Table 5). A large percentage, however, felt that in some ways they had been inadequately prepared for study in the United States. Fifty-two of the trainees said they had had no difficulty with English; twenty-one answered, however, that they were not strong enough in the subject matter, although 27 affirmed that they had been sufficiently prepared. Fifteen of the 21 who felt inadequately prepared said that they should have had better training in the basics of their respective fields or that they were deficient in mathematics, statistics, or chemistry.

The trainees were also asked, "What changes should have been made in the overall program abroad for it to have been more useful

TABLE 5. Trainees' Suggestions How the Universities They Attended Could Have Made the Training More Useful to Them, Cornell-ICA-UP College of Agriculture Contract, 1953-1960

Suggestions	Number of Trainees
Training was satisfactory or very satisfactory . . . . .	18
We should be permitted to remain longer for more university training ..	5
The university should provide for more practical experience in the area of specialization . . . . .	3
Assignments and classroom teaching should be more related to the Philippines and other foreign countries . . . . .	3
Guidance should be given to the trainees by professors acquainted with the Philippines . . . . .	2
Trainees should be permitted to take more specialized courses . . . . .	2
There should be more emphasis on research and use of laboratory equipment . . . . .	1
Too much time was spent on thesis work . . . . .	1
We should be permitted to live on a farm while attending the university.	1
Subjects taken in the Philippines should not be repeated in the U.S. University . . . . .	1
Many of the professors need to speak more clearly . . . . .	1
There should be an orientation period at the university before the trainees register . . . . .	1
There were too many places visited . . . . .	1
Gave multiple suggestions which are in the list above . . . . .	5
No complaints are justified . . . . .	2
Did not reply to the question . . . . .	8
Total . . . . .	55

to you?" The only response received from a high percentage of the trainees was that the training period should have been longer (See Table 6).

The overseas training program was not the only attempt to upgrade the staff of the College. As the various departments began to expand, more personnel were needed. Many of these started out as research assistants who were also part-time students in the College. As the departments became stronger, more graduate level courses were offered and this, plus the research experience, resulted in a stronger staff in general. Also, by the end of the Contract period several departments were offering graduate degree programs.

Major detriments to the development of staff were low salaries and infrequent promotions. This was true in 1952 and continued to be true in 1960. In effect these conditions negated much of the value of training personnel at the College. Many of the best graduates of Los Baños who were then hired by the College soon became disenchanted and accepted higher paying, more prestigious jobs in industry and in government.

Dean Myers expressed the opinion that at the end of the Contract the salary question was the biggest personnel problem at Los Baños:

"The College tended to follow a system of compensation much like civil service—you get paid according to how long you've been on the job. They weren't giving much consideration to achievement, and if you don't recognize the contributions of young men, they are liable to be picked off by private companies at higher salaries.

"Of course, that didn't hurt the Philippines immediately as long as there were enough good men for research to continue regardless of whether it was in private businesses, the government, or the colleges. But it isn't very sound to have a large number of your best men taken into business and then not have the top quality men needed for training the next crop of scientists."

Before the Contract ended in 1960, a large number of promotions and salary increases had been approved but not enough to correct the basic problem. That remained an issue long after the Cornell group returned to the United States.

### *Curriculum and Instructional Program*

At the end of the Cornell-Los Baños Contract in 1960 the most vulnerable area of the College's program according to the Cornell group was teaching.

Much of the difficulty with the resident instruction program throughout the eight years derived from a large student enrollment

TABLE 6. Trainees' Suggestions How the Overall Training Program Could Have Been Improved, Cornell-ICA-UP College of Agriculture Contract, 1953-1960

Suggestions	Number of Trainees
A longer training program:	
More time but no reason advanced to justify it .....	6
More time should have been allowed for travel .....	8
More time for practical work .....	4
More time needed for additional courses .....	4
More time needed to study under prominent men .....	3
More time needed for a degree .....	2
More time to spend at the experiment station.....	2
More time to tour Philippines after period of training abroad.....	1
Total number who suggested a longer training period.....	30
More practical training .....	2
More of the time should have been spent at the experiment station .....	2
More basic or specialized courses .....	2
More flexibility in the training program to meet special needs of the trainee .....	1
Should have an orientation course .....	1
Part of time should have been spent on another campus.....	1
Should have been permitted to observe other foreign countries .....	1
Should have been allowed to bring my wife .....	1
No answer or did not reply to the question.....	14
<b>Total.....</b>	<b>55</b>

and an overburdened faculty. At one point, for example, a required course had an enrollment of 1,672 students. This necessitated giving each lecture eight times and holding 52 laboratory sections. Even then students were forced to stand in the aisles, at the back of the lecture room, or outside listening through a window. Fortunately by the end of the Contract the College had restricted enrollment both in number and in qualifications for entrance. A contained enrollment helped reduce the teaching load, and make it no longer a major problem.

The large number of students had other ramifications for the College, also. First, it forced the College to hire young graduates to aid in instruction, Second, the necessity of increasing the number of teachers made it harder to hire research personnel. By 1960, however, the Cornell group felt that the student-teacher ratio (about 10 to 1 as compared to 24.6 to 1 in 1955-1956) was low enough to permit screening and selection of instructors, a second factor in upgrading the teaching program.

TABLE 7. Enrollment Profile in the College of Agriculture from 1952-1953 to 1959-1960, as certified by the Secretary of the College

Class	1952 -53	1953 -54	1954 -55	1955 -56	1956 -57	1957 -58	1958 -59	1959 -60
Undergraduates in Residence:								
Senior .....	91	156	270	457	569	828	555	608
Junior .....	123	210	373	579	810	851	764	381
Sophomore .....	253	439	643	927	1103	604	564	443
Freshman .....	591	808	1225	1713	801	628	698	524
Total .....	1058	1613	2511	3676	3283	2911	2581	1956
Graduate Students .....	10	15	26	39	64	65	42	57
Special Students .....	4	5	3	5	5	7	8	4
Cross Registrants from Forestry .....	38	70	163	387	363	166	207	85
Total attending classes .....	1110	1703	2703	4107	3715	3149	2838	2102

Yet another problem in the poor teaching situation, according to Project Leader Halsey Knapp, lay in the fact that teaching had become a "Sahara—a kind of dead area" at Los Baños:

"Everyday one hears of the achievements in research and of the individuals who are responsible for them. 'What has he done in research—what has he published?' are key questions. If the answers are in the negative, the results are devastating. The most heartwarming and encouraging statement that could be made at the College at the present time concerning a member of the faculty might well be 'He is a great teacher and leader of young people.' One does not hear it.

"Only the people who didn't have much hope or prospect in the field of research finally took up teaching, and the result was obvious."

TABLE 8. Faculty of Instruction, U.P. College of Agriculture, Who Actually Taught, First Semester, Academic Year, 1959-1960\*  
(Including U.P. Rural High School)

DEPARTMENT	FACULTY OF INSTRUCTION										TOTAL
	Profes- sor	Research Profes- sor	Asso- ciate Profes- sor	Assist- ant Profes- sor	Instruc- tor	Res. In- struc- tor	Assist. In- struc- tor	Re- search Assist- ant	Analyst or Con- sultant Enumerator	Visiting Profes- sor from Cornell	
Ag. Botany .....	1	1	-	-	7	-	6	2	-	-	17
Ag. Chemistry .....	-	-	1	1	5	2	5	3	1	-	18
Ag. Economics .....	-	-	-	2	4	-	3	-	-	-	9
Ag. Education .....	-	-	-	4	3	-	3	-	-	-	10
U.P.R.H.S. ....	-	-	-	-	4	-	5	1	-	-	10
Ag. Engineering .....	1	1	-	1	6	1	14	4	1	-	29
Agronomy .....	2	-	-	1	6	-	14	-	-	-	23
Animal Husbandry .....	-	-	-	2	7	-	8	3	-	-	20
Entomology .....	1	-	-	-	3	-	8	1	-	-	13
Home Technology .....	-	-	-	-	1	-	6	1	-	-	8
Languages .....	-	-	-	1	8	-	10	-	-	-	19
Plant Pathology .....	-	-	-	1	-	-	7	-	-	1	9
Soils .....	-	1	-	-	3	-	3	1	-	-	8
Mil. Science & Tactics .....	-	-	1	1	-	-	9	-	-	-	11
Physical Education .....	-	-	-	-	4	-	-	-	-	-	4
All Faculty .....	5	3	2	14	61	3	101	16	2	1	208

\*Ratio of students (2,108), including cross-registrants from the College of Forestry (73), to the faculty, based on the number of Faculty (208) who actually taught (Student-Faculty) .....

10.13:1

Excluding students from College of Forestry .....

9.78:1

Throughout the course of the Contract various departments revised their particular curricula by revising courses, adding new ones, consolidating old ones, and dropping some altogether. This considerably updated the instructional program of the College, but the major revision occurred with the closing of the agreement in June 1960.

As of that date the curriculum became a 151-unit, four-year program, with 72 units of general education including 15 units of English, three of speech, four of mathematics, six of natural science, five of Philippine history and institutions, eight of social science including three in Eastern Thought and Institutions and five in Western Thought and Institutions, seven of humanities, six of Spanish, and eighteen units of electives. In addition, beginning in the third year, students would take courses in their area of specialization. These courses would amount to 21 units, and the remaining 58 units would be earned in required courses offered in the College's technical departments.

A major innovation was the elimination of the undergraduate thesis which had originally been required of all seniors and later of all those in the Honors Curriculum. The visiting professors in particular had found this thesis requirement unsatisfactory because it took time away from necessary course work, required too much supervision, was of little educational or research value, and cheapened the concept of productive research. In place of the thesis program for undergraduates the College and the University had approved a three-unit Special Problem, which could be taken by students with a 2.5 or better cumulative average and would be credited toward the 21 major units. Although the Departments of Home Technology and Sugar Technology were to offer slightly different programs, they still incorporated the general education requirements.

Even with the introduction of the revised curriculum several problems remained and the Cornell group made the following comments in the Final Report:

1. Although the new curriculum in part tried to make up for some of the deficiencies in pre-college education, the only real solution to the problem was to alter the pre-college training itself.
2. The value of technological training at the undergraduate level should not be underestimated—particularly when the College was working toward a graduate program.
3. Provisions for farm practice—whether they be finding out about a student's experience before entering or providing an opportunity for additional time on private farms—should be included in the educational program leading to the Bachelor's degree.

### *Potentials for Graduate Study at Los Baños*

In 1960 only one public agricultural school, Central Luzon Agricultural College, and one private school, Araneta University, offered

advanced degrees in agriculture in the Philippines. Although 12 members of the staff of the College of Agriculture earned graduate degrees at Los Baños between 1952 and 1960, most of these were in the fields of chemistry and languages. By the end of the Cornell-Los Baños Contract, however, the Cornell group felt that several departments of the College were ready to begin graduate programs and others were moving in that direction.

In the Final Report the Cornell group commented:

"Graduate study at Los Baños should be considered from several points of view. Advanced training of the staff, when accompanied by maturity, vision, and experience, should enhance the quality of the work in research, instruction, and extension. The faculty of the College has the responsibility not only of maintaining a qualified staff but of training advanced workers and specialists for the Philippines. Thus a graduate training program seems essential."

The group further suggested that the graduate program should serve several needs, including the following: part of the need for teaching, research, and extension workers within the College itself; similar needs of other schools and colleges; the teaching profession in general; federal, provincial, district, and local government departments; cooperative and community organizations and programs; commerce and industry such as banks, cooperatives, marketing associations, and fertilizer, seed, sugar, copra, fiber, cereal, and chemical industries; farming; private endeavor; the needs of other nations for graduate study in both tropical agriculture and other fields.

Although the College was ready to begin offering Master's degrees in several subject matter areas, the visiting professors felt there was not enough depth and strength in the faculty to offer Ph.D. degrees at that time.

The seven areas capable of offering the Master's degree at the close of the Contract or shortly after were: Agricultural Economics, Agricultural Education, Plant Breeding, Botany, Plant Pathology, Poultry Husbandry, and Soils. Areas for future consideration included Agricultural Chemistry, Agricultural Engineering, Agronomy (Crop Production), Animal Husbandry, Entomology, Horticulture, Home Technology, and Sugar Technology.

Any graduate program, of course, depends to a large extent on the quality both of the undergraduate education and of the staff of the College itself. Setting up a graduate program at Los Baños also involved other considerations including the desire of graduate students to go abroad, the availability of financial assistance for foreign study, the fact the foreign degrees were held in higher esteem than local degrees and therefore might result in better pay and faster promotion, inadequate research and library facilities at the College, low regard for local

thesis requirements, difficulties with financing local graduate training, limited course offerings at the graduate level, and lack of a mature instruction staff.

The Cornell group noted that it would take time and effort for the administration and faculty to counter these problems. A program for achieving this goal included the following:

1. Improvement in grade school and high school education.
2. Stiffening of college entrance requirements and direction of unqualified applicants to vocational programs.
3. Improvement of the basic undergraduate program through course revision, elimination, and addition.
4. Development of a more qualified and experienced faculty, partly through in-service training.
5. Preparation of study and reference material based upon Philippine and tropical conditions.
6. Limiting of graduate training to the Master's degree in major fields of study but avoiding narrow specialization.
7. Organization of a graduate assistantship program.
8. Development of a student and staff exchange program.

While emphasizing the ultimate need for a graduate program at Los Baños, the visiting professors also stated that continued training abroad for the staff could be valuable as long as the right personnel, the right subject areas, and appropriate universities were selected. The group cautioned against concentrating students in only one university or country and added that the needs of the College should be of paramount importance rather than the wishes of individuals or departments.

The importance of graduate training at Los Baños extended beyond the needs of the Philippines to the rest of Southeast Asia. By 1960 the College had enrolled students from Vietnam, Indonesia, Laos, and Thailand as well as, to a lesser extent, India, Pakistan, the Marshall Islands, Burma, Korea, Ceylon, China, and Sarawak. During 1959-1960 there were 34 foreign students registered in the College.

Although these nations were developing their own programs in agricultural education, few were ready to undertake a graduate level program at that time. Yet these countries needed leaders and educators highly trained in agricultural sciences. This situation was recognized in the Final Report:

"It does not seem unrealistic to believe that the College of Agriculture of the University of the Philippines has a very strategic role to play in this situation. It has, or is rapidly developing, the personnel; it has the facilities and the reputation to do so. All that it really needs now are appreciation of the opportunity and acceptance of the responsibility. Granted the presence of these factors, the College might well move at once into the area of analysis, organization,

and implementation. This would be a partnership effort, with much consultation, and completely objective. It would not be the function of the College to seek to modify diverse philosophies and ideologies, or to inject those of the Philippines, but to nurture a community of scientists and scholars, to present truth and let it make its own way."

### *International Aspects of the Los Baños Complex*

By 1960 opportunities for development of international relationships and services at Los Baños were steadily increasing. Although the peak number of foreign students (51 students) had registered in the College in 1958 and the number had decreased in the two years since—largely because many of the countries in Southeast Asia were developing their own undergraduate programs—recognition of the College was growing (Appendix D). In the late 1950's several events at Los Baños greatly enhanced its reputation throughout the Orient.

First, the Community Development program was started at the College and a Community Development Center was built at Los Baños and opened in July 1957. Between April 1, 1959, and March 31, 1960, forty-seven groups from sixteen countries and the United Nations visited the Center.

Second, the International House, financed by a gift from the Rockefeller Foundation, was opened in 1959-1960. It contained dormitory space and dining facilities for both Filipino and foreign students.

Third, the Agricultural Credit and Cooperatives Institute (ACCI) opened at Los Baños in April 1960 and the first group of Cooperative Managers finished the training program before the end of the Cornell program. The need for trained personnel in this area had led the ACCFA to propose that a training institute be set up at the College. The ICA later approved the plan and provided funds to construct a central building. In June 1960 a dormitory was also under construction. Support for the Institute involved several different agencies including ACCFA, the University of the Philippines, the Development Bank of the Philippines, the Philippine National Bank, the Central Bank, and the CECA.

The general objective of the ACCI was to create a pool of workers to be employed by agricultural credit organizations and cooperatives not only in the Philippines but throughout Southeast Asia. Included under the ACCI program were pre-service and in-service training sessions, advisory activities, and regional conferences.

#### INTERNATIONAL RICE RESEARCH INSTITUTE ESTABLISHED

The most significant of these international ventures for the College and for Southeast Asia was the founding of the International Rice Research Institute (IRRI) on the Los Baños campus. The IRRI story

began not at Los Baños but in the rice fields of Asia, as recorded by Dr. Robert F. Chandler, Jr.,<sup>1</sup> the first director of the Institute:

"Although naturally it is possible that a number of individuals or organizations foresaw the value of a world center for rice research, the record clearly shows that the specific concept of an international rice research institute was first developed during the Asian visits—in the early 1950's—of Dr. Warren Weaver and Dr. J. George Harrar, then respectively director and deputy director of the Division of Natural Sciences and Agriculture of The Rockefeller Foundation. Their subsequent report, in 1954, to the foundation's board of trustees outlined the need for a research center devoted exclusively to the study of rice, a major world food crop. They pointed out, however, that their exploration of possible financial support for such an institute from the governments of the rice-growing countries of Asia had been disappointing. None of the top officials approached seemed to be against the idea, yet each took the stand that his country could provide funds only if the institute were located there. This reaction eliminated any hope of creating a rice center financed by multinational contributions.

Considering the amount of money needed to build and staff an international research organization large enough to have a major impact on rice production in Asia, the world's principal consumer of that grain, the officers and trustees of The Rockefeller Foundation decided that it would be unwise for the foundation to attempt such a project single-handedly. Instead they chose the more realistic and timely policy of providing funds to strengthen already promising rice research programs in Asia. Dr. Weaver and Dr. Harrar, who had become acquainted with many rice scientists and their institutions while in Asia in 1952 and 1953, felt that before they committed funds to implement the new plan a more thorough study should be made to identify the places and the projects where the foundation's support could most profitably be used. To that end they were fortunately able to obtain—for a period of 18 months, beginning in January 1955—the services of Dr. Richard Bradfield, the eminent agronomist from Cornell University."

Dr. Chandler accompanied Dr. Bradfield during the first eight months of this assignment. They visited the principal colleges of agriculture and agricultural experiment stations in most of the Asian countries. That was the start of the Rockefeller Foundation's action program in agriculture in Asia. Dr. Chandler reports what came next:

"As a result of our recommendations, many grants were made for scientific equipment, for books and fellowships, and for several specific research projects. As one of the ablest and most promising institutions in Asia, our good neighbor here in Los Baños, the College

<sup>1</sup>IRRI—The First Decade, Robert F. Chandler, Jr. in *Rice, Science and Man*, Papers presented at the tenth anniversary celebration of the International Rice Research Institute, April 20-21, 1972.

of Agriculture of the University of the Philippines, naturally received major attention.

“Although from 1955 onward the foundation made many agricultural grants in Asia, I do not recall that the subject of an international rice research center was significant in our discussions until August 18, 1958. On that day, Dr. Harrar (then director for the agricultural sciences of The Rockefeller Foundation) and I were invited to join a group of Ford Foundation officers at a luncheon meeting, at their dining room, to discuss possible cooperation between the Ford Foundation and The Rockefeller Foundation in a project to strengthen the College of Agriculture at Lyallpur, West Pakistan. Those present from the Ford Foundation were Dr. Forrest F. Hill, vice president; Dr. George F. Gant, program director for South and Southeast Asia; Mr. Alfred C. Wolf, program director for Latin America; and Mr. Walter Rudlin, program associate. I distinctly recall that toward the end of the luncheon Dr. Hill turned to Dr. Harrar and, in effect, said, ‘You know George, someone should undertake to work with rice the way you Rockefeller Foundation people have with corn and wheat.’ George Harrar replied that we (The Rockefeller Foundation) had been concerned with that problem for some time. Frosty Hill’s final remark was something like ‘We have some money. You have experience in agricultural research in the developing countries. We both are interested in doing what we can to help solve the world’s food problem. Why don’t we get together and see what we can do?’

“That exchange, in my opinion, was the beginning of the idea of cooperation between the Ford Foundation and The Rockefeller Foundation which in turn eventually resulted in their joint establishment of the International Rice Research Institute in the Philippines. . . .

“The next I personally heard of the idea, after the Ford Foundation luncheon conference, was a few months later, during a visit to Japan that my wife and I were making as part of an extended tour of Asian agricultural institutions. Dr. Harrar wrote that the idea of an international rice research institute had been thoroughly discussed among officers of the Ford Foundation and The Rockefeller Foundation and that serious mutual interest in a joint project existed. He stated that the first choice for the location of the proposed institute was the Philippines. And he asked that when we went there the following month that I determine the interest of appropriate officials in having such a center established in their country and, more specifically, at Los Baños, adjacent to the College of Agriculture of the University of the Philippines.

“Our visit to the Philippines took place from November 18 to December 6, 1958. During that time I conferred with, among others, the secretary of agriculture and natural resources, the Hon. Juan de G. Rodriguez; the president of the University of the Philippines, Dr. V. G. Sinco; the dean of the College of Agriculture of the University of the Philippines, Dr. L. B. Uichanco; and the head of the rice and corn research program at the College, Dr. D. L. Umali. There was

nothing but enthusiasm on the part of Philippine officials for the establishment of an international rice research center in their country. Dean Uichanco announced that the College of Agriculture could spare 40 hectares of land and that an additional 40 hectares could be purchased from neighboring landowners. I reported these optimistic findings to Dr. Harrar before continuing on our travels.

"In June 1959, after several months of additional correspondence between the Philippines and the foundations, Dr. Harrar, Dr. Hill, and I spent 5 days in the Philippines conferring with key government and university officials. We met with President Carlos P. Garcia, Secretary Rodriguez, and Undersecretary (of the department of Agriculture and Natural Resources) Amado M. Dalisay. We talked with President V. G. Sinco of the University of the Philippines, and in addition, at the College of Agriculture in Los Baños, with Dean Uichanco, Assistant Dean F. O. Santos, and Dr. Umali. During the course of our discussions we presented the outline of a suggested form of organization for the institute, and explored how, under Philippine law, it could function as a nonprofit, philanthropic organization with specific reference to such concerns as tax exemption and the immigration status of its staff. We also discussed the composition of the Board of Trustees and the acquisition of land for buildings and experimental fields. At this time it was agreed that if at some future date it should be mutually decided to terminate the institute as an autonomous enterprise, all its buildings, equipment, and other assets would become the property of the College of Agriculture of the University of the Philippines.

"Between June and September 1959, agreement between the two foundations was reached that the Ford Foundation would provide the funds for the physical plant and The Rockefeller Foundation would furnish the money for operating costs. I was asked to move to the Philippines in September to get the project started. The Ford Foundation advanced \$250,000 for such initial costs as land purchase and architectural fees. The Rockefeller Foundation provided \$165,000 for 1960 operational expenses. My wife and I arrived in Manila on September 27, 1959.

"By the time we arrived, the College of Agriculture, largely through the efforts of Dr. D. L. Umali, had made arrangements to purchase 40 hectares of land for the needed experimental fields. The college likewise provided land for buildings, both professional and residential, and 20 hectares for additional experimental fields. Later, another 20 hectares was bought for experimental work. All land was purchased in the name of the University of the Philippines. This land, plus that already owned by the University, was leased to IRRI for 25 years, at 1 peso a year, with an option for renewal for another 25 years at the same token fee."

In just two years and four months from the date of Dr. Chandler's arrival in the Philippines at the end of September, 1959, the Institute

had been planned, built and staffed, and research was underway before the formal dedication on February 7, 1962.

The main objectives of the International Rice Research Institute included the following:

1. Basic research on rice and all aspects of rice production, management, distribution, and utilization to improve the nutrition and economies of Asian nations and other rice-growing areas.
2. Publication and dissemination of research results and Institute recommendations.
3. Distribution of improved plant materials to regional and international research centers.
4. The development and education of scientists—mainly from South and Southeast Asia—through a resident training program headed by distinguished scientists in the various phases of rice production.
5. The establishment of an information center and library of the world's literature on rice.
6. The holding of periodic conferences, seminars, and forums dealing with current problems in rice research and production.

The international character of the Institute was emphasized by Dr. Chandler in 1960:

“With the facilities made possible by the recent grant from the Ford Foundation (\$6,900,000) and with the resources to attract a truly superior scientific staff, all concerned can look forward to the creation of an Institute that will be clearly recognized as the world's foremost research center on rice, the authoritative source of all important information on the crop, and a place where young scientists may receive superior training in any aspect of rice research.”

It is of interest to note that on July 22, 1960, Mr. Dean Rusk, President of the Rockefeller Foundation, wrote to Halsey B. Knapp:

“Just a note to say how much I have enjoyed and profited from my reading of the Final Report of the Cornell-Los Baños contract. It is a fascinating and impressive story. . . .

“We entertain the secret hope that, twenty years from now, your group will get some quiet satisfaction from the fact that Cornell's contribution had a great deal to do with the decision to launch the International Rice Research Institute at Los Baños.”

In the years following the termination of the Cornell-Los Baños Contract the importance of the Community Development Center, International House, ACCI, and IRRI continued to grow. The success of IRRI in particular helped pave the way for further international relations and activities at Los Baños and made it the rice research and training center of the world.

### *Shifts in Administrative Policies*

One of the important events affecting the future development of the College of Agriculture took place not at Los Baños but in the United States. From May to September 1955 Dean Uichanco of the College visited many universities, among them the University of Maryland, Harvard University, the University of Florida, the University of Puerto Rico, Purdue University, the University of California, and Cornell University.

#### DEAN UICHANCO AT CORNELL

Dean Uichanco spent six weeks in Ithaca studying the administrative structure of the University and of the New York State College of Agriculture at Cornell in particular. His major purpose was to find administrative means of leading Los Baños in the right direction in its rebuilding program. Four things especially impressed him: (1) the close-working relationship among the College of Agriculture, the agricultural extension service, the Cornell University Experiment Station and the New York State Agricultural Experiment Station, and the farmers themselves; (2) the quality and methods of the Cooperative Extension program; (3) the research program which greatly emphasized basic and applied research; and (4) the decentralization of the College administration.

The partnership of farmers, extension workers, researchers, and faculty and administration of the College was perhaps best brought out by participating in a meeting of the Advisory Council of the College of Agriculture. This council, which meets on a regular basis, includes farmers, representatives of farm organizations and the industries that serve agriculture to discuss all matters of common concern. Thus the farmers of New York State are able to present their problems and suggestions for research directly to those in the best position to help them.

Dean Uichanco found further testimony of this attitude of service by the College in trips to neighboring farms. Most of the farmers he met and talked with were familiar with Dean Myers and were on a first-name basis with him, had developed working relationships with Cooperative Extension, and were aware of the latest research findings of the experiment stations. Evidence of the effectiveness of this partnership were the farms themselves; the latest developments in agricultural science were being applied in the fields by farmers who knew what they were doing and why they were doing it.

Dean Uichanco was also impressed by the decentralized administration of the College. He observed that under the Dean of the College were directors of resident instruction, extension, research, and

finance, each of whom had a great deal of authority and responsibility over his particular areas. The same was true to a somewhat lesser extent among department heads. On both the College and departmental levels much of the work was done by committees and task forces composed of faculty members working as teams across departmental lines. As a result, everyone had a voice in administering his particular field of interest and in making suggestions for any part or program of the College.

#### ADOPTION AND ADAPTATION

Upon his return to the Philippines Dean Uichanco began instituting and adapting several of these ideas at Los Baños. In a letter to Cornell, however, he cautioned against merely mimicking the means by which Cornell established a sense of community effort and to decentralized administration:

"Now how could this be introduced in the Philippines? This is not as easy as it sounds. You cannot put responsibility on people who are not yet ready for responsibility.... We have got to adopt American practices slowly and within the possibilities of the situation. Unfortunately our agricultural system tries to ape the United States system whether it is good or not. We have to be intelligent about what we can adopt."

During the 1955-1956 academic year regular monthly meetings of the faculty were set up and 21 standing committees were established. Plans were also considered for naming directors of resident instruction and research as soon as approval could be obtained and the right men found for the jobs. Departmental staff meetings were also started. Professor Cline, who was then Project Leader, commended the Departments of Agricultural Economics and Animal Husbandry for the organization of their staffs:

"These departments are run by a system of committees, each with definite responsibilities and each functioning as a working group. By this method, all staff members have been drawn into the operation of the department head, and, as a result, they take an active interest in the work of the entire department over and above that of routine employees. This has been supported by a firm policy of weeding out incompetent staff. All departments could profit by this example."

The following year, for the first time in the history of the College, individual departments were allocated funds by the administration for supplies, labor, and travel. The department heads were given the responsibility to plan utilization of these funds, to authorize expenditures, and to maintain accounts. Work was also started in the Property Office to improve purchasing procedures.

## COLLEGE ADVISORY COUNCIL FORMED

During the 1957-1958 year an Advisory Council of the College of Agriculture was set up. Membership on the Council included 16 ex-officio members—administrative officials of the College, the DANR, and the NEC; three faculty representatives; 17 conference members—the president of the Alumni Association and managers and presidents of various producers associations, the Philippine Chamber of Commerce, the ACCFA, and others; and three members-at-large elected by the Executive Committee of the College.

The major aim of the Council was to serve as an advisory group to the College on its programs and priorities and as a spokesman of and for the College in order to acquaint the public with its services, programs, and needs. Unfortunately by 1960 the venture was not working out as well as had been hoped by the Cornell group. In the Final Report their enthusiasm was limited:

“Two meetings are held each year at the College. While some good material relating to the College is presented, the members merely listen, discuss it a little, have lunch, and go away to await another summons six months later.

“Attendance is ragged. There are really too many members with little interest or vested or competing interests. The social values are visible and pleasant. Many of the members will doubtless speak well of the College on occasion.”

The Cornell group felt that although the potential was there, the Advisory Council would do little real good until a strong program of information and a continuing involvement with the problems of the College were implanted.

Another need at the close of the Contract was growth of a “middle management” group within the departments of the College. This group would rank below the level of department heads but would be given the chance to gain administrative experience and take some of the work load from those in the higher positions. The Cornell group believed that this would help create a reservoir from which future promotions could be made.

Many shifts had been made in administrative policies and procedures and a philosophy of service to the people gradually was permeating the faculty as the eight years of assistance came to a close. Much of the payoff from the progressive changes were yet to be fully realized in the years ahead.



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## CHAPTER V

# An Appraisal of Eight Years of Cooperative Relations

### *Evaluation by Key Contract Personnel*

Appraisals of these eight years of cooperative relations were made, of course, by many people. In this section are presented statements, with one exception, published in the Final Report in 1960 by several of those who were closely involved. As viewed by these representatives of the cooperating governments and participating universities, the project was considered successful from almost every standpoint. It was fully recognized, however, that over the long haul the real measures of the success of the project will be the accomplishments of the U.P. College of Agriculture in its functions of teaching, research, and extension and in its ability to serve the people of the Philippines. And on the United States' side, success will be measured by the benefits of these experiences at Los Baños to the international dimension of the College of Agriculture at Cornell.

### *United States of America Operations Mission to the Philippines*

Paul D. Summers\*

In 1952 the Mutual Security Agency (now the ICA), Cornell University and the University of the Philippines entered into contracts for the purpose of rebuilding the physical plant and strengthening the faculty of the University of the Philippines College of Agriculture. The objectives have been met as evidenced by many new buildings containing improved equipment and by an enlarged and better trained faculty.

\*Paul D. Summers was Director of the International Cooperation Administration Mission to the Philippines when the first project terminated in 1960.

Under the cooperative arrangement Cornell University has supplied fifty-one highly qualified visiting professors. This has meant a contribution of approximately eighty man-years. Eighty-three faculty members of the College of Agriculture have been sent as participants to the United States and third countries for additional academic work. These efforts have served to strengthen the faculty, and the equipment and materials supplied have made it possible to do a better job of teaching.

The graduates of the College of Agriculture are rapidly assuming leadership in schools, private industry and government agencies. Thus the results of these cooperative relationships are now having a beneficial effect upon the economy of the Philippines.

ICA wishes to thank Cornell University for providing such high quality educators, and to express to the visiting professors its appreciation and thanks for the excellent job they have done. To the U.P. College of Agriculture, ICA wishes to express its appreciation for the fine cooperative relationships that have been developed and maintained.

We point with pride to this project. It has demonstrated how countries and institutions working together can attain objectives that promote the common good and, just as importantly, in their relationships advance understanding and good will among their respective peoples.

### *The Cornell-Los Baños Contract*

Leopoldo B. Uichanco\*

When the Cornell-Los Baños technical assistance program was initiated in 1952, the College had been going through its seventh year of slow and painful struggle to rebuild itself. The war had left what had been a flourishing campus a fire- and bomb-eaten wasteland. The few surviving material resources, including laboratory equipment, tools, seed stocks and animals, library, and records had been almost entirely whisked away by looters.

The teaching force was small, consisting of only some sixty members, a large number of them young and relatively inexperienced, who were serving their apprenticeship under a small body of the senior faculty. Quite a few of the latter were fast nearing middle age or drawing uncomfortably close to the statutory retirement-age limit. The intermediate group was virtually non-existent, because new appointments could rarely be made during the enemy occupation and in the uncertain years following liberation. Because of the low scale of salaries prevailing in the University, valuable professors who were helping maintain the tenuous standard of the College were being lost to

\*The late Dr. Uichanco was Dean of the College of Agriculture from 1939 until his retirement on November 1, 1959.

other branches of the government or to private service as these offered a higher pay. Even with a small enrollment, classroom and living quarters were crowded and research work was persistently handicapped by inadequate equipment, supplies and references. Financial support was often dishearteningly meager, not only because the University itself was rather parsimoniously supported, but also because it has been the traditional lot of the College of Agriculture often to be placed as a poor relation among its sister colleges.

The change brought about by the ICA-NEC (then MSA-PHILCUSA) program, the rapid pace of rebuilding, rehabilitation and upgrading of the physical and faculty resources of the College, revitalized teaching and research activities, substantially increased appropriations, phenomenal rise in student enrollment, higher respect generated for Los Baños in the Philippines and Southeast Asia, attraction of substantial grants from Philippine and foreign foundations, and scores of other consequent benefits need not be discussed here. I am sure they will be treated more fully elsewhere in the Cornell report. The various pertinent bureaus of the Department of Agriculture and Natural Resources entered into close working partnership with the College in many agricultural projects, particularly in research, and they were proud to be taken in as collaborators. Some of the bigger and old-established agricultural schools, seeing the rise of Los Baños evidently sought to partake of the reflected glamour through metamorphosis, by legislative action, into agricultural colleges.

To College faculty members who have dedicated many years to its service, it is certainly heartwarming to note the latest evaluation of its present status, this time from the members of the U.S. Congress Foreign Affairs subcommittee, as reported in the Manila press, under the Washington dateline of March 13, 1960, that "the subcommittee singled out a Philippines project as particularly meritorious and an example of good results which have been obtained through the technical aid program. The project dealt with the U.P. College of Agriculture and Forestry [sic] at Los Baños, which was described as 'especially favorable'."

Time and again I have been informed on good authority that the Cornell-Los Baños contract has been one of the most successful ICA-sponsored projects in any part of the world. A great deal of that success is doubtless due to the unusually high caliber of the men and women sent to Los Baños under that contract. While Cornell University had long been noted for the eminence of its staff in science and scholarship, Dean W. I. Myers and his successor, Dean Charles E. Palm, took pains to handpick from among them the men assigned to Los Baños. Not infrequently, the contract was implemented at the cost of depleting the teaching force in Ithaca. Once in Los Baños, the visit-

ing professors quickly forgot that they were Americans working among Filipinos. They did not act as advisers or "experts", but as co-workers addressing themselves to a common task. Their wives mingled freely among Filipino wives and their children went to the same schools as the Filipino children. An American girl was fined five centavos in Maquiling School when the teacher overheard her speaking Tagalog to her Filipino classmates. As an elementary school, the use of English was required so the pupils could learn the language faster. The rule was an old one and unfortunately it did not give allowance for the American girl who might come later and wish to learn Tagalog.

The question could well be asked, "Might the Cornell Contract have been as successful, or perhaps more so, if it had taken place elsewhere?" Cornell's faculty is strong and able, and presumably the teams sent out would be fully equal to meet other situations. However, the Philippines, and especially Los Baños, offered certain peculiar combinations which doubtless helped. Clash of cultures, which not infrequently results when two peoples of different races and from different environments are brought together, has been reduced to a minimum, because Filipinos had had half a century of intimate exposure to the American way of life, thought, language and idiosyncracies since Dewey's victory in Manila Bay.

The College of Agriculture, founded in 1909 by Dean Edwin Bingham Copeland, and further developed into a strong teaching and research institution by Dean Charles Fuller Baker, was run for years by American faculty members, who in turn trained Filipinos gradually to take over. From the first Philippine Commission, headed by President Jacob Gould Schurman, of Cornell, who established civil government in the Philippines, a considerable number of Filipino engineers and other technical men had the advantage of advanced training at Cornell. Time and again, a large majority of Filipino holders of M.S. and Ph.D. degrees on the College faculty bore the unmistakable imprint of Ithaca. They, together with the pioneer American professors, played an important part in building up the reputation of Los Baños, which even prior to the war was attracting students from the Philippines and Southeast Asian countries and gaining favorable attention in the scientific world. On occasions in the past, in Dean Baker's time, when the College of Agriculture was attacked in the Manila press and in the halls of the legislature as a useless college and a "college of failure," it was the local American business group, through the powerful American Chamber of Commerce, who gallantly defended its cause and saved it from possible closure. With this background, I am sure Los Baños is entitled to at least a small part of the credit for the happy outcome of the Cornell-Los Baños Contract.

It does not seem so long ago that the first group of Cornell visiting

professors came to Los Baños. It has been eight years of a most enjoyable Philippine-American association and pregnant with significant accomplishments which I am sure will pass into history as one of the brightest chapters in the life of the College. Cornell and Los Baños have been drawn together and I hope the happy relationship will endure long after the formal termination of their contract in June, 1960. We shall ever be grateful to Cornell University, the ICA agencies in Manila and Washington and the Office of Foreign Aid Coordination of the National Economic Council for their sustained support and understanding.

### *The Cornell-Los Baños Project*

William I. Myers\*

From the very beginning of the program, I have been an enthusiastic supporter of international technical cooperation because of my belief that it is one of the most effective ways of strengthening the countries of the free world in their struggle against Communism. In view of the fundamental importance of agriculture, it was evident that the New York State College of Agriculture at Cornell had a great opportunity, as well as a challenging responsibility, to participate in this program. Such a move was also consistent with the international traditions and character of this and other colleges of Cornell.

Although we received requests for cooperation from two other Far Eastern Colleges, we accepted the invitation of the U.P. College of Agriculture and we are glad we did. A major reason for this decision was our friendly pride in this new nation which was generally regarded as the show window of democracy in the Far East. Other factors were our high regard for Los Baños staff members who had studied with us in prior years and the traditional close friendship between Cornell and the Philippines which has continued since President Schurman's service on the first Philippine Commission more than half a century ago.

The objective of the Cornell-Los Baños project was to help rebuild and develop the U.P. College of Agriculture as an effective institution for modern scientific agricultural research and education and to train Filipinos to carry these responsibilities as soon as possible. From my point of view the success that has been achieved has far exceeded my expectations. Great progress has been made in strengthening the staff by providing research experience and graduate training for more than a hundred young, promising faculty members. Reasonably adequate buildings and scientific equipment have been provided by public

\*Dr. Myers was Dean of the New York State College of Agriculture at Cornell University when the Contract was initiated and continued as such until his retirement July 1, 1959.

and private funds. Increased numbers of students have been enrolled to provide more trained men and women for public service and private employment. Effective cooperation has been developed between the College and the Department of Agriculture and Natural Resources and other governmental agencies. As a result of effective research, private corporations have provided increasing financial support for projects in which they are interested. And the College has demonstrated that it deserves adequate governmental support by its program of public service and its willingness to help solve important problems of agriculture and of rural people.

In addition to its great contribution to increasing food production, the College has regained and surpassed its prewar position as the leading regional agricultural training center in Southeast Asia. The excellent staff and program of the College have attracted the attention of the Rockefeller Foundation and generous grants have been made for an International House, for books and equipment, and for fellowships for further training of promising faculty members. The most important recent development in this area is the establishment of the International Rice Research Institute at Los Baños as a cooperative project of the Ford and Rockefeller Foundations. Although operating independently, this research institute, as it achieves worldwide recognition, will enable the College to make a greater contribution to agricultural progress in the Philippines and in neighboring countries.

The progress that has been made has been due in large measure to the wise leadership of Deans Uichanco and Umali, the wonderful hospitality and fine cooperation of the Los Baños staff, and the outstanding work by the Professors and their wives of the Cornell team. Other favorable factors of major importance were the generous financial support of the International Cooperation Administration and the cooperation of its officials both in Manila and in Washington.

With a well-trained, enthusiastic young staff, the able leadership of Dean Umali and reasonably satisfactory buildings and equipment, continued progress is assured if the College receives adequate regular financial support from the Philippine government. While grants from Foundations and private corporations are desirable means to expand important lines of work, they do not reduce the need for adequate dependable support by the government. Modest salary increases have been made, but further improvement is imperative to meet local competition and to retain a high quality staff. A well-planned program of agricultural research and education is essential to the welfare of farmers and the nation, and the funds required for such a program are an investment in national welfare that will pay high returns.

In addition to the satisfaction of helping our Filipino friends to rebuild and strengthen their College of Agriculture, we at Cornell have

received other important benefits. Every Cornell Professor who has served at Los Baños has returned not only a broader, better informed, more loyal citizen, but also a more competent scientist and teacher. While everyone benefited from this experience, the greatest gains were made by our younger men who had not had a chance previously to develop their leadership capabilities or to handle major responsibilities. It was not easy to spare these outstanding men from our program but overall we have been amply rewarded for our efforts and sacrifices. The friendships that we have made will, we hope, help bind our Colleges and our Nations more closely together in defense of freedom now and in the years to come.

### *Why the Cornell-Los Baños Contract Succeeded*

Dioscoro L. Umali\*

The U.P. College of Agriculture marks with pride the success of the Cornell-Los Baños contract which has yielded during the past eight years mutual benefits to the participating institutions. To what can we attribute this success?

One of the significant reasons has been the practice of Cornell to send only the best men to Los Baños. The Cornell visiting professors include some of the top scientists in their special fields. They possess excellent academic preparation and experience and have won the respect and confidence of their co-workers and students at Los Baños.

Their personal relationships with the Filipinos have been admirable. They have worked as equals of the Filipino staff and not as superiors. They have not harped on the weak points of the Filipinos nor have they derided conditions in the Philippines. Instead, they have geared their activities to these conditions, building on the resources available here. They worked with the staff in the fields, in the sun, mud and rain. They have not claimed the sole credit for achievements during the project. Not to be underestimated is the fine way they have adjusted themselves to Philippine conditions. Their children have attended Philippine schools and have learned to speak our national language.

Another leading reason for the success of the Contract has been the good qualities of the program itself. Before any project was undertaken, the American and Filipino groups consulted each other. The Cornell project leader met regularly with policy-making groups of the College and the Cornell staff were members of strategic College committees. Before a visiting professor was assigned to Los Baños he was first approved by the U.P. College of Agriculture after a review of his bio-data. It was significant that a service term was set for each visiting

\*Dr. Umali became Dean of the U.P. College of Agriculture November 1, 1959, upon the retirement of Dean Uichanco.

professor within which he was expected to accomplish his goals. A visiting professor's term, however, could be extended if desired.

The plans and projects had continuity. If it became necessary that work in one phase be extended, arrangements were made so that the new man would be ready to continue the project.

Lastly, the Contract was successful because the College itself was ready for the assistance. The College of Agriculture at Los Baños has many capable agricultural scientists on its staff. Some of them were already known internationally before the last world war. The atmosphere at College is wholesome and conducive to fruitful endeavor. It is free from politics and therefore free from the debilitating effects of political interference. Personnel are appointed on the basis of merit. Moreover, Americans and Filipinos have a common belief in democracy and the spirit of freedom in the College provides a satisfying work atmosphere. The fact that English is the medium of expression in the College has also removed many possible barriers to understanding and mutual trust and confidence among the workers.

The termination of this successful Contract should not break the ties forged between Los Baños and Cornell. It should in fact strengthen Cornell's understanding, not only of the Philippines, but also of all Asia. With the insight it has obtained in agriculture in this part of the world, Cornell University could perhaps institute courses in tropical agriculture. Also, Cornell and the University of the Philippines could, perhaps, work out a training program for people who will work in similar technical alliances involving institutions of learning in different countries.

For the work at Los Baños, we hope that even if the government to government assistance ceases, support by private foundations will be developed. For there will never be a time when the U.P. College of Agriculture will outgrow its need for development and strengthening to serve not only the people of the Philippines but possibly the whole of mankind.

### *Eight Valuable Years of Cooperative Effort for Agriculture*

Charles E. Palm\*

It seems impossible that eight years have passed so quickly in the fine cooperative effort between two great universities and the governments of the United States and the Philippines. The Cornell-Los Baños project, developed for the welfare of Philippine agriculture and the people it serves, will always be a high point in the lives of the many

\*Dr. Palm who succeeded Dean Myers as Dean of the New York State College of Agriculture and Life Sciences at Cornell University retired from the deanship on July 1, 1972.

Cornellians who were privileged to live and work with their Filipino friends.

Of the 51 staff members recruited for the project by Cornell, 35 came from our own faculty and another 9 were Cornell graduates. Ten per cent of our faculty in the College of Agriculture have lived and worked at Los Baños for periods of from one to two years. As a result, we have a tremendous asset for understanding problems and conditions that face agriculture in that part of the world.

Cornellians are grateful to their hosts in the Philippines and to the International Cooperation Administration for the opportunities given them during their tours of duty and for the wonderful friendships developed between members of Filipino and American families. These personal relationships will be enriched through the years and will be a source of continued interest and strength between the two groups.

In 1952, Dean W. I. Myers of Cornell and Dean L. B. Uichanco of the U.P. College of Agriculture inaugurated a program of high purpose and worked together to obtain the very best staff for the project. An opportunity to start over, as it were, from the ruins that were left of the College after the war provided the challenge under this exceptionally fine leadership. The outstanding results have been recorded in many ways, but notably through the reconstruction of the College and the rebuilding of its faculty with young men and women dedicated to serve the future of their country through agriculture. Many of these young people came to the United States on project funds for advanced study. They have taken home new knowledge in their fields of professional interests.

Much has been accomplished through mutual effort, confidence and respect. A new physical plant arose for the training of students and research, resident instruction and extension programs have been strengthened. The pattern of the Land-Grant University, which was envisioned in the United States when President Lincoln signed the Morrill Act in 1862 and which developed the underlying strength of agriculture in America over the past century, has found acceptance at Los Baños. Service to the people of the Philippines is inherent in this philosophy and is exemplified currently through the work of the College. Moreover, Los Baños has become the leading training center for agriculture in Southeast Asia as its influence spreads far beyond its own borders.

At the close of the Contract, our staff returns home to its duties. We are stronger for having had this opportunity and hope that we have contributed to a more prosperous and effective agriculture in the Philippines. The years ahead will see continued cooperation in many ways between Los Baños and Cornell. A strong, vigorous agriculture, growing in importance in countries around the world, may well

furnish in our time the balance of power needed in the crucial growth of world populations. The cause of freedom is interwoven with man's ability to feed and clothe himself and his fellow workers who are engaged in industry and in the arts and sciences.

We salute the great College of Agriculture at Los Baños, its staff and its fine program, and wish it well for the tasks ahead!

Perhaps the most comprehensive evaluation of the total effort of the Cornell-Los Baños program was made by Dean Leopoldo B. Uichanco in an article he wrote for *Science* in 1958. It is reprinted here, since it presents so clearly his appraisal of the accomplishments of the program.

### *Foreign Aid and Agricultural Science*

Leopoldo B. Uichanco

For some reason, certain Filipino leaders have recently taken a critical view of the American aid program in the Philippines. So far as I can gather, the principal bases for the criticism are: (i) the total amount spent in dollars is disproportionately small in relation to the counterpart peso funds (two pesos equal one dollar); (ii) much of the peso expenditure is used for the benefit of American experts; (iii) in not a few cases, these so-called experts are not really experts at all, but people with relatively little training and experience; and (iv) the program apparently aims to shackle the Philippines to an agricultural economy, as is shown by its over-emphasis on agriculture, at the expense of industry.

It should be pointed out that the United States Congress on its part has also been showing uneasiness toward the foreign aid program because of the adverse criticisms voiced by, and the heavy burden the program imposes on, the American taxpayer.

Without attempting to refute the arguments advanced, I wish to relate our experience in the operation of what is presently known as the ICA-NEC (International Cooperation Administration-National Economic Council) program in the College of Agriculture of the University of the Philippines at Los Baños. The International Cooperation Administration is the United States agency which carries out programs of economic development and technical cooperation in many of the less-developed nations of the world. The National Economic Council is the national economic planning and coordinating center for the Philippine Government.

#### WAR DESTROYS COLLEGE

World War II left the College of Agriculture and its Central Experiment Station in shambles. Most of the buildings were in ruins

and nearly all the animals, seeds, tools, equipment, laboratory apparatus, and library were either destroyed or looted. Although brave attempts were made to reopen the College to students in June 1945, while the rest of the university was still closed, almost no facilities were extant, and emergency shelter for faculty and students had to be found temporarily in old poultry laying houses. Indeed, about the only asset of the College that was left was the experienced faculty that, happily, escaped general massacre on the campus by the retreating enemy.

Prospects for ever rebuilding the College looked bleak. We had but a dim hope of restoring it to the status it had attained at the outbreak of the war, when, in 32 years, it had grown in prestige to be one of the world's leading tropical agricultural institutions. The war damage awards to the University of the Philippines, which came a couple of years later, at first gave us some reassurance. However, this new source of relief was to prove quite elusive, for out of the 10 million pesos granted to the university, we were given only 400,000 pesos.

When what is now the ICA-NEC program began to operate in 1952, things began to happen in the College of Agriculture. We became the happy recipient of generous grants, thanks largely to the previous flattering recommendations of the American Agricultural Mission and of the Bell Mission. These two missions were sent by the United States Government to the Philippines after World War II to study the needs of the country and to make recommendations to meet those needs. An important feature of the program was the Contract for technical assistance signed between the University of the Philippines College of Agriculture at Los Baños and Cornell University.

#### TECHNICAL ASSISTANCE TEAMS

As a result of this Contract, which will continue until 1960, a succession of teams of not more than ten American professors (later increased to 14) have been assigned to the college, each to be in residence here for not less than one year. In practice, some visiting professors found the work so interesting and challenging that they stayed about two years. Thus, during the past five years, we had the privilege of having on our faculty, in succession, 34 American professors. Many of them were top-ranking in their lines of specialization. Of the 13 in residence during the past year, three were department heads and one, an associate dean. Three professors are mainly supported by grants from the Council on Economic and Cultural Affairs, which has its headquarters in New York City.

Dean W. I. Myers and his colleagues at Cornell University have been so justifiably proud of their part in the Los Baños program that they have always taken great care to select only high-grade men for assign-

ment here. They have drawn heavily on the Cornell faculty, even at some sacrifice to that institution. Some of these visiting professors were borrowed from other American universities. As an added precaution, the record of each candidate for assignment is first sent to Los Baños for scrutiny and approval.

The salaries of the visiting professors are paid, in dollars, from the International Cooperation Administration headquarters in Washington. Because these are ranking men on their respective faculties, the annual bill settled by Washington in salaries alone is considerable. The International Cooperation Administration, Washington, also pays the transportation and living and other allowances for our College of Agriculture faculty members who are sent abroad for advanced training. Every year about ten Filipino faculty members could avail themselves of this privilege, and to date 54 have been sent. Most obtained advanced degrees and have become valuable permanent assets to the college faculty.

Against these Washington expenditures, which total about a million pesos a year, our counterpart in the college for the support of the Cornell contract is only about 200,000 pesos a year, to meet transportation costs, living expenses, utility allowance, cost-of-living expenses, and per diems of the visiting professors and their families. The per diems for members of the family are paid only in connection with actual travel between the college and their respective residences in the United States. Of course, much larger peso allocations than this have been made to the college under the ICA-NEC program, but not a centavo of these additional sums has been spent for the visiting American professors. They have been used for improving the facilities; for hiring additional Filipino faculty members, research assistants, and technicians; for constructing more laboratory and classroom buildings and residences; for acquiring laboratory and farm equipment, and for purchasing livestock, increasing library facilities, and introducing numerous other improvements.

#### CLOSE WORKING RELATIONSHIPS

As a result of this aid, in physical and faculty assets the College is at present very much better off in many respects than ever before in its 48 years of life.

The American faculty members do not function separately as an American group; they are members of the college departments to which they are assigned. The working relationship has certainly never been that of the American scientist and his native assistant, as was unfortunately the humiliating experience in this country even after World War I, which had allegedly been waged to "save the world for Democracy." American and Filipino have now happily worked as col-

leagues in Los Baños, where one is not the teacher and the other the perennial pupil; they have collaborated closely, studied together, and learned from each other. Even the members of their families have considered themselves a part of the local community, and their children have studied and genuinely enjoyed their experience in the same schools with the Filipino children, with whom they have developed lasting friendship and mutual respect.

#### LARGE STUDENT ENROLLMENT

Mainly as a result of the partnership between Cornell and Los Baños, the past five years have seen phenomenal growth in the College of Agriculture. From an average of 500 students, enrollment rose rapidly until it spiralled to over 4000 in 1955. Subsequently, limitations on new admissions had to be imposed by the faculty in an effort to safeguard standards. At present, the student body is held down to about 3000. Even this is somewhat too many for the capacity of the faculty, of only about 200, and of the facilities, but this number is deemed necessary to produce an estimated 300 graduates a year and to meet the growing requirements of the country in agricultural services.

The College is again steadily attracting students from neighboring countries, as it did before the war, and Washington and private American foundations have come to regard the College as a training center in agriculture for Southeast Asia. At present, we have 53 students from four foreign countries.

Likewise, various important government units and private concerns that deal with agricultural development and promotion have sent their men to the college for in-service training. The principal training center of the Community Development Program, under the Office of the President of the Philippines, is located on the College campus, where the faculty is actively cooperating.

Generous allocations by the Council on Economic and Cultural Affairs and the Rockefeller Foundation have been earmarked for the support of East Asian students in the College and for the following additional purposes: to engage certain highly qualified American professors; to upgrade library, classroom, and laboratory facilities; to help some deserving young faculty members to take up graduate studies in the United States; and to enable a limited number to make study tours abroad or attend international conferences. Recently, the Rockefeller Foundation likewise made a sizable grant of half a million pesos to establish and maintain an International House on the campus. Local government and private entities have also made grants, largely for research and graduate scholarships.

## RESEARCH PROGRAM FOSTERED

Research has always been given due emphasis by the faculty of the College, from the beginning of its life, because of the strong feeling that no one can be an effective teacher who is not at the same time an active researcher. Otherwise, the subject matter he imparts could grow stale and flat as he merely parrots borrowed ideas which are not constantly freshened and enlivened by first-hand contact with natural processes. Also, the faculty has been conscious of the fact that the Philippines is not a rich country because agriculture, on which its economy is based, has remained quite weak.

As has been the experience in other lands, it has been found that high agricultural productivity cannot be attained unless a sustained research program is fostered to solve numerous problems which serve to depress farm income. Of paramount importance is the fact that research enthusiasm is contagious, and the teacher-researcher quickly imbues his students with the desire to find out things for themselves and to develop the creative spirit of a scholarly mind.

Unfortunately, research funds, in the past, were perennially short. In 1918, the Legislature voted and made available the sum of 125,000 pesos for establishment of the Central Experiment Station in the College of Agriculture. The funds went into the purchase of additional lands, which enlarged the college area from the originally very inadequate 70 hectares to a much more capacious 400 hectares. A more adequate stock of farm animals were acquired, and farm implements were purchased.

Sad to relate, the Experiment Station was to be quickly forgotten, and no continuing support was to be forthcoming. Hence, whatever research could be done was carried out through the meager sums that had been squeezed out of the slim funds intended primarily for educational purposes. Creative scholarship was maintained largely on the spare time or overtime of the faculty and of the more advanced students.

These conditions should have disheartened any but the most determined; they are related here not to offer an excuse for limited accomplishment. When one looks back, the wonder indeed is that the faculty and students could make any contribution at all. Despite tremendous odds, the annual research output of the College rose progressively, and much of the basic foundation for modern agriculture in the Philippines was laid down through these earlier efforts.

The operation of the ICA-NEC program and the Contract between Cornell and Los Baños brought two tremendous forces into play to accelerate research in the College: (i) the sustained availability of ample funds for research, which permitted acquisition of needed facilities and adequate technical manpower, and (ii) the healthy intel-

lectual cross-fertilization between two groups of people, American and Filipino. We certainly congratulate ourselves on the fact that Cornell could take over the Contract with Los Baños, because it has afforded us close association with a great American agricultural institution, with its over-a-century head start over the Philippines in experiment-station work and with its American organizational know-how.

#### RESEARCH BENEFITS FARMERS

As a result of these first years of collaboration, great strides have been made in agricultural research. The Filipino farmer is already beginning to reap the benefit of superior, higher-yielding varieties of rice of good eating quality, the foundation stock of which has been the result of the patient and persistent work of our plant breeders. Five strains of double-hybrid corn, the first of their kind in the eastern tropics, have been outyielding the ordinary kinds, and in not a few cases the harvest reaches as much as 90 *cavans* per hectare (1 *cavan* equals 2.2 bushels).

Experiments have indicated that we overwater lowland rice fields, because it was found that 2.5 centimeters, or half or even a fourth as much as is now commonly used, accomplished the same results. Hence, a more rational management could make possible the expansion of irrigated areas two- to four-fold.

Effective insecticide treatment against the destructive rice borer and the rice bug has been found.

Eleven arabica coffee plants have been isolated as rust-resistant strains; these may well prove to be the beginning of the rehabilitation of this important money crop, which had been wiped out in Batangas in the 19th century by the rust. To accelerate distribution of rust-resistant arabica stock to farmers, further large-scale importation of these proven rust-resistant seeds was again made from India. With the cooperation of the Bureau of Plant Industry, these seeds are being planted in different stations in various parts of the country. The seedlings are sprayed with rust suspension to eliminate the small percentage of rust-susceptible plants. The survivors will then be distributed.

Artificial insemination to improve local livestock more effectively, speedily, and economically has been proved to be practical in this country. At present a central bull stud is being built on the campus, with the cooperation of the Bureau of Animal Industry, to serve livestock farmers in every province.

Research on soil and fertilizer needs of crops, study of sociological and economic problems of the farm, utilization of agricultural products and by-products, and very many other projects have been undertaken. Attention to these different items is aimed at increasing production and putting more pesos in the farmers' pockets.

## AGENCIES AND COLLEGE COOPERATE

One important aspect of our research program is that, for the first time in this country, there has come about a close and active cooperation between the College and the Department of Agriculture and Natural Resources, which is concerned with all phases of the agricultural programs of the Philippines. The result has been the further strengthening of the agricultural research program in this country, where, rather than being competitive, these entities now pool their resources.

Under this arrangement, the main responsibility of the College is basic research, while the corresponding bureaus of the Department of Agriculture and Natural Resources attend largely to development and extension. Because of varied conditions in different sections of the country, field stations of the department's bureaus have become available to college researchers for cooperative regional tests. For that matter, certain agricultural schools also participate as cooperators, to make it possible to cover many of the different climatic and soil conditions in the country. Hence, if a superior variety of rice or hybrid corn is recommended for any particular locality, the recommendation carries the assurance that it will be backed by a reasonably adequate study right in that vicinity.

Hand in hand with cooperation in research, cooperation with the Bureau of Agricultural Extension has been considered paramount. Taking useful information to rural people is the principal responsibility of this bureau in the Department of Agriculture and Natural Resources. Research is not of much value if it ends in the laboratory or experimental field. The results should reach farmers as quickly as possible so they can be put to use. In this difficult task, we have been leaning heavily on extension personnel.

## STRENGTHEN AGRICULTURE FIRST

Has too much emphasis been placed in this country on agricultural development at the expense of the industrial? The fact is obvious that a healthy economy demands that our agricultural program be balanced with a certain degree of industrialization. Industrial research must, therefore, be properly attended to. Unfortunately, the tendency in too many countries, including those in our part of Asia, such as Thailand, Pakistan, India, Formosa, and even our Philippines, has been to launch a disproportionately ambitious program of industrialization and shove agriculture into the back seat. A swing to this extreme may well spell disaster, as was unfortunately the sad experience in Argentina, in Peron's time, when the economy of the country was nearly ruined through overindustrialization.

Before we can industrialize to any considerable extent, agriculture, which is the basis of our economy, must first be strengthened. Vigorous, sustained, and adequately supported research is necessary to solve the many important problems that still remain to be studied to make our farms give more bountiful yield. For a good many crops, superior seeds that could produce fourfold or more still await development. Better farm management has to be worked out to make operation more economical and more efficient; needs for fertilizer have to be more precisely determined; numerous pests, diseases, and weeds that exact a heavy toll on the harvest cry for more effective control.

As it is now, the average Philippine farmer, it is estimated, can raise only enough for himself and three other persons. Compare him, for instance, with the American farmer, who, after feeding himself, has enough left over for 20 other persons. As we raise the efficiency of our agricultural worker, more manpower could then be released to industries without harmfully affecting the farm, and the average per capita income would have sufficiently improved to take care of the market for the industrial products. These goals can hardly be attained if we slacken, rather than accelerate, the pace and intensity of agricultural research.

### *Major Achievements of the Cornell-Los Baños Contract*

What then were the major achievements of the Cornell-Los Baños Contract? In the opinions of two of the Cornell men most involved with the project, Dean William I. Myers and the last Project Leader Halsey Knapp, there were many.

#### “OPENED DOORS” AND THE LAND-GRANT CONCEPT

Professor Halsey Knapp believed that, given the purposes of the Cooperative Program, the major achievement of the eight years was simply that the Filipino staff was better prepared to forge ahead on their own than they had been before. Part of the reason, according to Professor Knapp, was that the Cornell contract had “opened doors.”

“When you undertake a project of this kind, and as you begin to get results, the horizon is extended; you see more that needs to be done that you hadn’t seen in the first place. . . . Your mind isn’t closed; the door is open.

“And this afforded the possibility for the Filipinos to see potentials that hadn’t been reached—to see them and to be willing and prepared to press on toward them.”

Dean Myers felt that perhaps the most important accomplishment was the instilling of the land-grant concept of public service through programs of resident instruction, problem-solving research, and ex-

tension. Although methods used in these three phases had to be adapted for the Philippine needs and culture, in the long run they proved effective as guidelines for the College to follow as it expanded its agricultural programs.

#### STAFF TRAINING AND ADMINISTRATIVE CHANGES

Both men believe that of the more tangible accomplishments of the project none ranked higher in importance than the training of College staff in the United States. At the time the Contract went into effect, such overseas training was about the only way the Filipinos had of upgrading the level of teaching, improving the kinds and methods of research, and giving younger members of the staff the opportunity to learn what an agricultural scientist had to know to train others in the classroom and in the fields and laboratories. Among the several objectives of the Cornell program this probably had the greatest potential and achieved the greatest results in terms of what Los Baños needed if it were to continue to grow after the termination of the agreement.

Dean Myers and Professor Knapp also cited administrative changes at Los Baños as major accomplishments. "When we first went to Los Baños," Dean Myers said,

"the College was almost a dictatorship. The dean was the boss.

The department heads were the oldest men, primarily because the whole Philippine society gave the maximum recognition and authority to the older men. The younger men on the faculty didn't have much of a chance for advancement; they didn't dare say their souls were their own at department meetings at first. But eventually, by sending younger men abroad, we demonstrated that you didn't need to have men over 60 running the show. Then gradually some changes came about."

These changes included the decentralization of many of the functions of the dean and of the department heads, alteration in budget and purchasing procedures, and the setting up of the Advisory Council of the College of Agriculture. Professor Knapp added that naming Dioscoro Umali, a relatively young man, as Dean Uichanco's successor in 1959 was further evidence of the reordering of priorities and reemphasis on accomplishments and ability rather than age and status.

#### WHAT WAS LEFT TO BE DONE

Of course much was also left to be done at the end of the Contract. Although both Dean Myers and Professor Knapp felt that Cornell had not fallen short of its original intentions in any major area, both also believed that solutions to many problems encountered by the

visiting professors and the Los Baños staff were yet to be discovered. In some cases the answers had been found, but time was needed to fully apply them. Major difficulties that still plagued the College included lack of textbooks, need for more materials related to conditions and climate of the Philippines, lack of coordination in teaching and research, low salaries and infrequent promotions, need for reducing research studies quantitatively and improving the quality, more efficient use of experimental land for experiments, lack of permanent sources of research funds, and the inexperience of the staff.

The willingness of the Filipinos to try to solve these and other problems is perhaps best evidenced by their attitude toward recommendations made by the Cornell group. Between 1954 and 1959, according to the Final Report, a total of 482 recommendations were proposed relating to work in the College as a whole. Of these, 367 or 76 per cent were accepted and appropriate changes made. Another 72 or 15 per cent were considered desirable by the College but had to be postponed because of money problems or similar difficulties. Only 12 suggestions were discarded, and only 37 were tried and then abandoned (Tables 9 and 10).

TABLE 9. Recommendations Made by Visiting Professors

DIVISION ACCORDING TO AREAS OF INTEREST		
	Number	Percentage
Research.....	105	22%
Instruction.....	101	21%
Extension.....	35	7%
Staff.....	92	19%
Buildings and Facilities.....	74	15%
Department Management.....	29	6%
General Administration.....	46	10%
Total.....	482	100%

TABLE 10. Stage of Adoption of Recommendations Made by Visiting Professors

	Adopted or Underway	Planned for Future	Discarded	Tried but Abandoned	Totals
Research.....	79	14	5	7	105
Instruction.....	83	9	1	8	101
Extension.....	25	8	—	2	35
Staff.....	80	8	2	2	92
Buildings and Facilities.....	45	21	1	7	74
Department Management.....	22	4	1	2	29
General Administration.....	33	8	2	3	46
Totals.....	367	72	12	31	482
Percentages.....	76	15	2.5	6.5	100

At the close of the project Professor Knapp felt that the College would have to develop three attitudes in particular if it were to continue growing and serving the people of the Philippines and South-east Asia. First, the Filipinos needed to learn to feel that they could rely on themselves and to have confidence in their own abilities. One of the ways the Cornell group tried to achieve this was by encouraging the staff to take advanced degree programs at the College instead of going overseas at much greater expense and loss of time. In certain areas such study at Los Baños was still not practical by the end of the Contract, but in several departments plans were made for offering the Master's degree.

Second, Professor Knapp believed that the Filipinos had to begin placing teaching at a higher priority level in planning and manning their programs. Although emphasis on research of high quality was desirable, that emphasis should not lead to the downgrading of teaching.

Third, the College had to develop a sense of being part of a whole—the whole being Southeast Asia rather than just the Philippines. By June 1960 signs were encouraging. The number of foreign visitors was increasing, largely through the Community Development Training Center and the Agricultural Credit and Cooperatives Institute. Prospects were further brightened by expectations of the role the International Rice Research Institute would play at Los Baños.

#### EVALUATION BY DEPARTMENT HEADS

In evaluating the roles the visiting professors played in their departments, department heads listed the following areas where they felt the Cornell Contract had achieved the most:

1. Advisory services—in departmental organization and policies.
2. Staff development—training overseas and on the job, attitudes and morale, travel within the Philippines.
3. Improving the work of the department—in research, improvement of quality, quantity, and organization; in instruction, improvement in teaching, teaching aids, books, and reference materials; with off-campus activities and improved relations with other organizations and groups.
4. Physical help—supplies, equipment, and facilities; building construction and renovation; labor.
5. Specific programs to serve farmers.

The department heads also felt that the Cornell Contract might have been more effective in several ways. First, several stated that help would have been greater if individual visiting professors had served in their departments for longer terms—perhaps a minimum of two or three years. Others suggested that greater emphasis should

have been given to instruction, more specific duties should have been assigned to visiting professors, closer coordination with department heads would have been advisable, more travel for department staffs should have been arranged, and improving specific facilities should have been stressed. Each of these comments, however, with the exception of the length of service suggestion, was listed by only one department head.

### *Time to Come Home Arrives*

By the time Professor Halsey Knapp arrived in Los Baños in 1957 to assume the duties of Project Leader, the Cornell group had long since adjusted to living conditions in the tropical Philippines. What once might have caused anxiety now was accepted with nonchalance and good humor. More important, the understanding that the American style of life was not to be expected or desired in the Philippines had gradually come about.

#### EARTHQUAKES, RATS, AND CHRISTMAS

Events that might have been considered major happenings in the first hectic days of the project were taken matter-of-factly. For example, Professor Trimberger in writing to Professor Cline on November 2, 1956, reported that there had been four earthquakes so far that fall—including two within six days: "Just enough to rattle the houses and knock a few cans of food from the shelves if the pile were high. This does not seem to bother anyone."

Oftentimes, too, what might be looked upon as major problems at Cornell were considered as no more than minor inconveniences at Los Baños. On August 11, 1958, the following letter was sent to the head of the Chemistry Department:

"Dear Dr. Banzon:

The rats invade my office by day. I have no information concerning what they do at night, but I suspect and surmise.

Can we inhibit, deter, or otherwise confound them?

Sincerely,  
Halsey B. Knapp  
Project Leader"

The next day Professor Knapp received his reply.

"Dear Dr. Knapp:

"The accompanying letter reached my desk and I presume Dr. Banzon has delegated to me the task of sowing confusion among the ranks of the rat invaders in your office.

"Forthwith, I marshal my resources and will join in battle with the rats come this afternoon.

Sincerely yours,  
Pablo J. Alfonso"

Not all adjustments to Philippine life were without Americanized touches. A letter from Professor Knapp to Professor Guise dated December 26, 1958, reported that Christmas for the Cornell group had been a blend of traditions from two cultures.

"I have a nice small balsam from the U.S. for a Christmas tree. The Commissary brought in 400 at \$1.75-\$2.00 each, about five feet tall. Good for small apartments, etc. We put ours on a stool to give it a more commanding effect."

In another letter to friends the Project Leader stated that his front yard was "bright with unbelievably beautiful red poinsettias. Our favorite stands far taller than we." He also wrote that instead of the traditional American holly wreath on the front door "Every home has a Christmas star"—a silver and white star with long streamers that was lighted at night.

The fact that precautions that would have been unheard of in the United States had to be taken at Los Baños occasionally was also accepted by this time. For example, on November 4, 1959, Professor Knapp addressed the following memo to all Contract personnel and their families:

"During this pre-election period, we are asked to avoid public meetings and crowds and overnight trips.

"We should use only main roads and then only during daylight hours.

"Election Day, November 10, should be spent in our homes.

"These precautions sound extreme to us, but there are sound reasons, based on past experiences, for them."

#### THE PROJECT ENDS

Finally, the time to come home arrived.

"When you undertake a job of this kind," Professor Knapp recalls,

"and the horizon is extended as you begin making progress, there's the danger that you'll feel the job will never be done and you'll never be ready to come home.

"But there comes a time when you realize you can never really reach that horizon. And you begin thinking, 'Well, maybe these people would have accomplished some of these things even if we hadn't been here. After all, they weren't static, they weren't standing still when we arrived.' And then you think maybe it's time to go home and see what they can do on their own.

"The purpose isn't to cut off the relationship entirely, but to take a fresh look at the situation without being too influenced by what you feel still needs to be done. This objectivity may mean that some other direction that should be taken in the future is discovered."

The time for that fresh look came in June 1960.

Ties between Los Baños and Cornell were not to be cut abruptly with the end of the Contract. If even further assistance had not been forthcoming, the friendships that had developed over the eight years would have held the two together. The friendship of Professor Knapp and Dean Umali serves as an example.

On April 14, 1960, Professor Knapp wrote to Professor Guise that he wanted to order an academic gown with Cornell's colors for Dean Umali, who had received his Ph.D. there. Following a series of letters and telegrams back and forth and problems with mail service, the gown and hood arrived in Manila on June 14. On September 12, Dean Umali wrote to Professor Knapp:

"I do not know how to thank you for that very well tailored, state-side commencement 'sweatsuit.' In life I have had only a few surprises, but this one really tops them all. Only great friends are capable of such rare thoughtfulness. In the forthcoming commencement this November, you can imagine me in the academic procession walking with my chest out and stiff as a rod. I am sure the flies will be too scared to alight on me."

Professor Knapp was the last Cornell official to finish his duties at Los Baños. He was also the last Project Leader and had originally been selected for the job because of his administrative experience as director of the State University of New York Agricultural and Technical College at Farmingdale. He had retired from that job in June 1956; four years later another job was finished. On June 24, 1960, he wrote the following:

"Dear Partners:

"It is time to turn the key in the door.

"The rest of the statement would normally have to do with shaking the dust of Los Baños from our feet. But the rainy season this year came before the dry season started and there is no dust to be shaken. In any case, I doubt that any of us wish the divorcement to be so complete.

"As a matter of fact, the Cornell-Los Baños Contract came officially to an end four days ago. But I have stayed on [to June 25] to tidy things up a bit.

"Copies of the Final Report have been distributed Campus-wide this morning. Your copy will be on the way to you tomorrow. It is not a love and kisses document. George T. [Trimberger] might term it a bit hard nosed in spots. We do not seek complete agreement or endorsement. We hope that it is objective and that it may stimulate and challenge. If so, something better than anything we have envisioned may emerge.

"I just want to greet you as members of the team and to tell you that the place carries your mark and that it is the better for it. I am deeply conscious of my own indebtedness to you, both my contempo-

raries and those who preceded me. It has been a good show and I am glad to have shared it with you. . . .

"Now, as my last official act (it is really extra curricular or ex post facto or something of the kind, being June 24) I salute you—Mabuhay!—and sign this document.

Sincerely,  
Halsey"

A few days earlier a plaque was presented to Cornell by the U.P. College of Agriculture in commemoration of eight years of fruitful association. Dean Umali and Professor Knapp clasped hands and pledged continued close relationships between Cornell and Los Baños. Carved on the beautiful Philippine wood were these words:

To the New York State College of Agriculture, Cornell University, from the College of Agriculture, University of the Philippines, in appreciation of eight years of close and friendly cooperation which fostered the growth and enrichment of agricultural education and research in the Philippines.

College, Laguna, Philippines  
June 20, 1960



INTERIM PHASE: 1960–1962



## Chapter VI

# Plans for Further Development of the College of Agriculture University of the Philippines

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## CHAPTER VI

# Plans for Further Development of the College of Agriculture University of the Philippines

### *Preliminary Discussions on a New Cooperative Program with Emphasis on Graduate Education*

In September 1961, just over fourteen months following the termination of Phase I, the Cornell-Los Baños Contract, Dr. N. B. Tablante visited Cornell University for preliminary discussions with Dean Charles E. Palm and his associates on the possibility of reviving the cooperative arrangements between Cornell University and the U.P. College of Agriculture. At that time, Dr. Tablante was Director of ACCI, located on the Los Baños campus, and also Professor of Agricultural Economics. In the discussions with Dean Palm, which also included Professors Richard Bradfield (Agronomy), G. W. Hedlund and John W. Mellor (Agricultural Economics), R. A. Polson (Rural Sociology), and K. L. Turk (Animal Science), Dr. Tablante reviewed the continuing developments at Los Baños. He emphasized that because of the success of the previous Cornell-Los Baños program, Dean D. L. Umali and others in administration of the University of the Philippines had instructed him to explore Cornell University's interest in entering into a new program, especially with the objectives of strengthening the graduate education programs of the UPCA. Competency for offering graduate studies was gradually developing in several of the departments; many fields were offering M.S. degree programs, and a few had started Ph.D. level work. Dr. Tablante pointed out that after five to six years of a mutual assistance program in graduate education, UPCA hoped that it would not find it necessary to send its young staff overseas for graduate level work, especially at the M.S. level. Eventually, it was expected the College would want to do most of its own Ph.D. level training and that by virtue of its quality and stature in the region, UPCA might gradually develop into the leading center for advanced education and research in Southeast Asia.

Dean Palm and his associates gave a favorable response and indicated Cornell's keen interest in a new cooperative relationship that would prove mutually beneficial to both universities.

These preliminary discussions were very timely in relation to steps that already had been taken by Dean Palm late in 1960 and early 1961 to explore the role of the New York State College of Agriculture in a continuing program in international agricultural development. An advisory committee was formed, with Dr. Richard Bradfield as chairman, to bring together recommendations on what the role of the College of Agriculture should be in the important area of international agricultural development.

Some of the recommendations dealt specifically with the questions raised by Dr. Tablante just a few months later. For example, the Bradfield Committee recommended "that cooperative contract arrangements be developed with one or two foreign universities for the purpose of developing those institutions into regional centers of research, teaching, and extension in the agricultural sciences." Further, it recommended "that this College should continue to take a special interest in the College of Agriculture, University of the Philippines at Los Baños, Philippines."

### *Proposal for Further Collaboration*

At the time the Cornell-Los Baños program was terminated in June, 1960, there was agreement there should be a continuing relationship between the UPCA and Cornell University in order to capitalize fully upon the gains that had been made. For example, in the final report former Dean L. B. Uichanco said:

"It has been eight years of a most enjoyable Philippine-American association and pregnant with significant accomplishments which I am sure will pass into history as one of the brightest chapters in the life of the College. Cornell and Los Baños have been drawn together and I hope the happy relationship will endure long after the formal termination of their contract in July 1960."

Dean D. L. Umali made these observations:

"The termination of this successful contract should not break the ties forged between Los Baños and Cornell. It should in fact strengthen Cornell's understanding, not only in the Philippines, but also of all Asia. With the insight it has obtained in agriculture in this part of the world, Cornell University could perhaps institute courses in tropical agriculture. Also, Cornell and the University of the Philippines could, perhaps, work out a training program for people who will work in similar technical alliances involving institutions of learning in different countries. For the work at Los Baños, we hope that even if the government-to-government assistance ceases, support by private foundations will be developed. For there will never be a time when the U.P. College of Agriculture will outgrow its need for development and strengthening to serve not only the people of the Philippines but possibly the whole of mankind."

With this kindred spirit continuing, a tentative proposal, "A Program for the Further Development of a Regional Agricultural Research and Educational Center for Southeast Asia," was developed late in 1961 by a committee of faculty members at Cornell that, if implemented, would bring about a renewed relationship with Los Baños. By building on strengths already attained between the Philippine and United States governments, the two universities, and the other agencies by this time functioning at Los Baños, it was felt that an opportunity now presented itself for a renewed and more vigorous partnership that would strengthen further the UPCA. At the same time, such a program would strengthen the international agricultural development dimension at Cornell University and help it meet the needs of students from Southeast Asia, as well as other developing areas, and better prepare American students for participation in solving problems in world agriculture.

The proposed program was to be an integrated one of many complementary parts. With special emphasis on graduate education and research, it was to be built upon a significant existing Filipino faculty and facilities. To this would be added a judiciously chosen complex of resident American faculty, American consultants, faculty and consultants from Southeast Asia, and American and Asian graduate students, along with a substantial program on the Cornell campus. It was felt that further development of the faculty and facilities would make Los Baños increasingly attractive as a regional educational and research center for the training of agricultural leaders for other countries. There are many advantages in having such a center where students from other countries can study under environmental conditions similar to their own.

The faculty and revitalized programs of UPCA had attracted the attention and cooperation of the Rockefeller Foundation and grants had been made since 1955 for books and equipment, for fellowships for advanced training of promising young staff members, and for an International House to serve as a dormitory for students from the Philippines and other countries. Increased numbers of students from other Asian countries were enrolling at Los Baños for training in the agricultural sciences.

Another favorable feature was the International Rice Research Institute which was to be dedicated in February, 1962. The addition of approximately 20 outstanding scientists for research on all aspects of rice culture from the important rice-growing countries of the world would add greatly to the scientific community of the Los Baños complex of institutions. Trainees were expected to start arriving later that year to study and carry out research under the guidance of senior scientists of the Institute. It was anticipated that many of the trainees

would enroll in the Graduate School of the University of the Philippines for formal course work in many disciplines; therefore, high-quality course offerings would be essential.

Other examples of growth at Los Baños were the Community Development Training Center and the Agricultural Credit and Cooperatives Institute. Both of these were serving important functions in training people from other countries, as well as the Philippines, and would continue to contribute to the overall development of Los Baños as a regional educational and research center.

The Council on Economic and Cultural Affairs (later named the Agricultural Development Council) had continued to provide professional personnel and other support for research and training, especially in agricultural economics, rural sociology, and extension education.

From its standpoint, the College of Agriculture at Cornell felt that it, too, was uniquely suited for the proposed partnership. Many of its research, teaching, and extension staff had been successfully involved in past collaboration with the University of the Philippines. Over one-half of its department heads had major foreign experience, mainly in the Philippines. And it was embarking on a major expansion of its on-campus efforts in international agriculture that would be coordinated with an outstanding Southeast Asia Studies Program.

### *Development Program for the College of Agriculture, University of the Philippines*

In February 1962 the UPCA under the dynamic leadership of Dean D. L. Umali, prepared a "Proposed Development Program for the U.P. College of Agriculture." The purposes were to strengthen teaching, research, and public service through extension by improving the available human and material resources and supplementing these through financial technical assistance from outside sources. This proposal was developed in full recognition of some of the problems as outlined by Dean Umali as follows:

"More than half a century after its establishment in June, 1909, the College of Agriculture of the University of the Philippines has grown in size and responsibility to become the fountainhead of education and research in agricultural science, serving not only the Philippines, but also other newly developing nations in Southeast Asia. In fact, it has become a veritable symbol of intelligent and responsible leadership in the field of agriculture.

"In the face of new challenges to provide the trained leaders that will help develop the agricultural potentials of the countries in this region of the world and because of greater opportunities for service to humanity, the physical facilities and human resources of the College have proved inadequate. Under these circumstances, the time is most propitious for stock-taking and for planning the long-term

development of the institution, if it is to maintain its strategic position of leadership and if it is to cope with the growing demands for agricultural scientists, educators, technicians, scientific farmers, and other personnel needed in the schemes of economic and social development both here and abroad."<sup>1</sup>

Simultaneously, with the development of the proposal by the faculty of the UPCA, communications were continuing between Dean Umali and Dean C. E. Palm. The Cornell proposal was reviewed by Filipino staff members who indicated a desire to integrate its features into their comprehensive, long-range development program. A conference was held at Los Baños in February, 1962, which involved Dean D. L. Umali and several others among his associates, and former Dean W. I. Myers and Dr. Richard Bradfield of Cornell University. Interests were expressed in exploring further the possibilities for continued cooperation between the U.P. College of Agriculture, Ford Foundation, Rockefeller Foundation, Cornell University, and the Philippine and United States governments.

The importance and complexity of this matter indicated that a team of consultants should be invited to assist Dean Umali in preparing a plan which, if implemented, would greatly strengthen the College in its efforts to serve the needs of the people of the Philippines. Accordingly, the Rockefeller Foundation agreed to provide a grant of funds for support of this special review team of consultants.

The review team consisted of Dr. R. D. Osler, Assistant Director for Agricultural Sciences, Rockefeller Foundation; Dr. N. C. Brady, Professor and Head, Department of Agronomy, Cornell University; and Dr. Kenneth L. Turk, Professor and Head, Department of Animal Husbandry, Cornell University. Both Professor Brady and Professor Turk had served as visiting professors from Cornell under the original Cornell-Los Baños Contract. The general purpose of the study was to assist Dean Umali and his staff to draw up a plan that was both desirable and feasible for the development of the College in all of its disciplines. Specifically, the objectives given to the review team were:

1. To evaluate the adequacy of the College staff, both academic and nonacademic, in providing high-quality instruction, research, and extension in agriculture for the Philippines and other Southeast Asian countries.

2. To evaluate the curriculum, quality of instruction and research, and adequacy of financial support for all functions of the College.

3. To make a study of the College physical facilities and services and to suggest appropriate improvements and adjustments that will permit the College to serve more effectively as a distinguished educational institution.

<sup>1</sup>Preface to the proposed development program for the College of Agriculture, University of the Philippines (a consolidated proposal, revised August, 1962).

## METHODS AND PROCEDURES USED BY THE SPECIAL REVIEW TEAM

The special review team spent the month of May, 1962, in Los Baños working jointly with the faculty of the UPCA to evaluate the needs for expanded programs in instruction, research, and extension and for improvements in the physical facilities essential for carrying out the functions for each of these dimensions.

As its focal point for starting this review, the team made a careful study of the "Proposed Development Program for the U.P. College of Agriculture," giving special attention to the comprehensive analysis of the staff and facilities that had been made by the faculty. Justification was given for further development of the staff in the several areas of activity, with special emphasis to needs for strengthening graduate studies.

In preparation for the work of the review team, Dean Umali had established four faculty committees whose functions were to develop summaries of the needs of the College in each of the four major areas of extension, research, instruction, and business affairs. Much time was spent with these committees and full consideration was given to their recommendations. Detailed reviews were made of the work in the individual subject matter departments, as well as in the Business Office, College Infirmary, Service Division, Farm Operations, Office of Student Affairs, and Division of Physical Education. In the departmental reviews, an analysis was made of course offerings and enrollments, teaching materials used, classrooms and teaching laboratories, facilities, space and equipment for research, and of research projects. In addition, there was an opportunity to talk with a random sample of faculty members in each department to obtain their judgment on basic needs of the College of Agriculture and specifically of their departments. Through questionnaires, much additional information was obtained on present staff and their formal education, needs for additional staff, limitations in programs, and basic needs for equipment, supplies and physical facilities.

Those in charge of the student dormitories and staff housing gave the consultants an opportunity to observe the present on-campus and off-campus housing for students. Also, needs for staff housing were thoroughly appraised.

Visits also were made to the cooperating units located on the College campus, that is, the ACCI, Community Development Center, and the IRRI. In addition to observing the new facilities and equipment of the IRRI, the team of consultants held conferences with the senior scientists of the Institute to discuss their research and training programs and to explore possibilities for any assistance they were prepared to give in graduate instruction at the College of Agriculture.

Two conferences were held in Manila with Mr. James H. Ingersoll,

new mission director for the Agency for International Development (AID) to get acquainted with him and his staff and to inform them of the objectives of the team's presence in the Philippines. Furthermore, the objective was to obtain the help and advice of AID/Manila in evaluating the UPCA and the place it might play in agricultural education and development in the future, not only in the Philippines but also in neighboring countries.

Dean Umali arranged for several profitable conferences with high government and university officials to acquaint them with the plans for the further development of the College of Agriculture and the objectives of the review team in helping to work out these plans. Several prominent members of the President's Cabinet participated in one of these conferences, including the Vice-President and Secretary of Foreign Affairs, the President's Executive Secretary, Secretary of Agriculture and Natural Resources, Chairman of the National Economic Council, Commissioner of the Budget, and Presidential Assistant on Community Development. Separate conferences were held with Vice-President Pelaez, Government of the Philippines, and General Carlos P. Romulo, who had just been inaugurated President of the University of the Philippines. All of these people recognized the key role of the College of Agriculture and that of the University of the Philippines. They were keenly interested in the work of the review team and expressed a strong desire to assist in every way possible in obtaining government support to implement the development program.

All important aspects of the evaluation of programs and facilities and the proposals for further development of the College were developed jointly with Dean Umali, his directors, and members of the major committees of the College. There was general agreement on the recommendations with enthusiastic expressions of a desire for their implementation in order to increase the effectiveness of the College of Agriculture in its role of service to agriculture through education and research. Of special interest was Dean Umali's comment:

"We wish to reiterate our firm belief that greater efficiency and success can be achieved in implementing the College development program under the joint efforts of Cornell University and the University of the Philippines on a sister-university basis of working relationships than if the College of Agriculture were to go it alone. It is, therefore, most fortunate that the revival of the Cornell-Los Baños partnership arrangement has been integrated into the report of the review team. The Cornell proposal, 'A Program for the Further Development of a Regional Agricultural Research and Educational Center for Southeast Asia,' has our full understanding and support."

After receiving suggestions from Dean Umali and a number of others who were vitally interested and concerned, the consultants

made some revisions and issued their final report in July, 1962.<sup>2</sup> Copies of the report were distributed for study to representatives of the Ford and Rockefeller Foundations, Council for Economic and Cultural Affairs, Agency for International Development, Philippine Government, University of the Philippines, and Cornell University.

Included in the report was a full discussion on the possibilities of an integrated approach in the implementation of this proposed program of development that would involve the Philippine Government, the UPCA, AID, private foundations (especially Ford, Rockefeller, and the CECA), Food and Agriculture Organization of the United Nations, and a sister university in the United States. Through such collaboration and joint leadership the UPCA could develop further into a major regional resource for demonstrating an integrated approach to research, resident teaching, and extension for agricultural development.

With improvements in staff, physical facilities, and increased support for maintenance and operation, the College could train more students, both undergraduate and graduate, from the Philippines and other Southeast Asian countries and could provide training and experience for American students preparing for assignments and careers in overseas development programs. Further, it could provide new knowledge of the complex biological, economic, and cultural processes which are the crux of agricultural development but about which so little is known.

The major recommendations are presented here, since much of the UP-Cornell Graduate Education Program, 1963-1972, later was concerned with most of them.

#### RECOMMENDATIONS OF SPECIAL REVIEW TEAM

The most important problems facing the UPCA are listed in order of importance:

1. Quality of the academic staff is the foundation of any educational institution. The number of staff in the professorial grades must be at least tripled in the next five years if the College is to develop at the rate proposed in this review. Vigorous efforts should be made to accelerate the improvement of staff quality by:
  - a. Setting up a realistic salary scale which will attract and hold competent scientists and scholars.
  - b. Giving high priority to the salary and promotion of young, competent, and productive academic personnel in all departments.

<sup>2</sup>A *Development Program for the College of Agriculture, University of the Philippines*. A report of a special review team of the Ford and Rockefeller Foundations and Cornell University in cooperation with Dr. D. L. Umali, Vice-President for Agricultural Affairs, University of the Philippines, and his administrative and academic staff. July, 1962.

- c. Initiating a program of mandatory advanced training for the research assistants, assistant instructors and instructors with provisions for study abroad for the most competent.
- d. Providing fringe benefits such as low rental apartments, access to cultural and recreational facilities and the continuation of arrangements for low interest housing loans and low utility rates for on-campus houses.
- e. Providing more readily the "tools of the trade" such as supplies, equipment, and labor to expedite the work of the faculty.

2. Immediate attention should be given to strengthening the staff and programs in the basic physical sciences if their weaknesses are not to impair the educational program in the entire field of life sciences. The ultimate aim should be to form a combined physical sciences division or department staffed with some of the most competent scientists and teachers in the Philippines. Salaries competitive with those of other government and private agencies must be offered to accomplish this objective.

3. Next to improvement in staff quality, support for the maintenance and operation of the physical plant and equipment should receive the highest priority in making plans for the future of the College. Before any extensive expansion or renovation of physical facilities, equipment, or educational training is done, a programmed increase in operating funds for the College, channeled through the University of the Philippines as an annually recurring budget, must be assured. It is suggested that no less than 7.7 million pesos would be required annually to operate the College if the expansion proposed herein were to be realized. (This is in addition to capital construction costs and to funds for special purposes from outside agencies.)

4. In order to provide academic training, research, and extension programs of the highest excellence, marked expansion and improvement of the physical plant are absolutely essential. Among the most critical are the following:

- a. A modernization and expansion of the academic facilities to include the following:
  - (1) The construction of new buildings to house: (a) the new physical sciences division and central classrooms; (b) administrative personnel, central extension offices and the new Department of Agricultural Information and Communications; (c) the basic biological sciences departments and central classrooms; (d) offices and teaching facilities for agronomy; (e) a student union building; (f) a faculty recreational center or club with an adjoining auditorium.
  - (2) The construction of annexes with concomitant renovation of present buildings to provide additional space and facilities for: (a) the College Infirmary; (b) the buildings for

Agricultural Economics, Agricultural Engineering, Home Technology, and Soils; (c) the boys' and girls' dormitories.

- (3) The renovation and modernization of buildings vacated by the foregoing changes to provide space for other units of the College.
- b. An expanded faculty housing program to include:
  - (1) A speedup in provisions for the construction of 60 on-campus private dwellings.
  - (2) The construction of 90 rental apartments for married and unmarried staff and graduate students, including those from outside the country.
  - (3) The construction of 14 houses for visiting professors and post-doctoral fellows.
- c. Expansion and complete modernization of the public utilities including the electric, water, and telephone systems, with adequate provision for the maintenance of the improved systems. Expansion and improvement of the campus road and pathway systems will be needed.
- d. Installation of a modern sewage system to service the College buildings as well as the on-campus student and faculty housing units.

5. Excellence of instruction should continue as the first goal of the College, to be attained by placing constant emphasis on (a) improvement of teaching competence through required graduate training at home or abroad and by means of on-the-job teaching seminars; (b) greater availability and use of textbooks of all kinds and of manuals and syllabi prepared to meet student needs under Philippine conditions; (c) improvement of the classroom and laboratory teaching facilities; and (d) an effective undergraduate advising system.

NOTE (The remainder of the recommendations are listed within a specific area of operation at the College. No attempt has been made to list them in order of importance.)

#### *General and Organizational Affairs*

6. It is urged that efforts be made to bring about greater flexibility of salary items that will permit promotion of the most competent staff throughout the College and more efficient use of available salary funds. All salary items might well be considered in relation to the needs of the College as a whole and should not be "frozen" within departmental or administrative budgets.

7. Continued efforts should be made to strengthen and give greater flexibility to the offices of the directors by: (a) setting up separate budget items for the position of director independent of departmental budgets, and (b) expanding their duties and responsibilities to upgrade the quality of their respective programs.

8. Most of the assistant instructors, research assistants and lower grade instructors should gradually be replaced with half-time graduate assistants working in research and/or teaching. This should upgrade the competence of the teaching and research staff and also greatly expand the graduate education program.

9. Consideration should be given to the establishment of a new Department of Agricultural Information and Communications to expedite the dissemination of agricultural information and to provide instruction in the art and science of communication. This department probably should be housed in an enlarged College administration building.

#### *Instructional Program*

10. The present course offerings of each department should be carefully evaluated periodically in terms of: (a) expected course content in relation to staff competency, (b) total number of courses, especially in relation to the size of the student enrollment and to the subject matter organization, (c) the possibility of combining similar courses and the offering of some of the more specialized courses in alternate years.

11. Expansion of graduate studies should take place in a given department no more rapidly than the increase in the number of high-quality staff in that and related departments. For example, improvement must be made in the competence of the chemistry, physics, and mathematics staffs to provide supporting training for graduate students in all the biological science departments.

12. Student quality should be improved by expanding the scholarships and assistantships available to the most highly qualified applicants at both the undergraduate and graduate levels.

13. The student extracurricular activities should receive greater attention through provisions for additional physical facilities and a planned program for cultural, social, recreational and athletic development.

#### *Research Program*

14. Vigorous attempts should be made to obtain a higher proportion of the College's research budget through the regular U.P. annual appropriations. This will permit the employment of permanent staff and the making of long-term plans for research based on the needs of the country.

15. Through the Office of the Director of Research, continued emphasis should be placed on research quality and output through: (a) reducing the number, increasing the specificity, and improving the quality of research projects, (b) allocation of research funds to departments and specific projects with the concomitant expectation of specific accomplishments; and (c) expansion and improvement of cooperation between departments and with other research agencies, such as the Bureaus of Plant Industry, Animal Husbandry, and Soil Conservation.

*Agricultural Extension*

16. The activities of the College in agricultural extension should continue to expand, especially in the training area, through: (a) the appointment of a Director of Extension whose duties and authority would be similar in his area to those of the Directors of Research and Instruction, (b) the appointment or employment of at least one extension specialist in each of the subject matter departments to help plan and expedite an enlarged extension program, and (c) the provision of building space for the office of the Director of Extension in an expanded administration building.

17. Some funds for agricultural extension should be allocated through the regular U.P. budget to supplement the outside support for this work. The expanded extension program should be based on long-term objectives in agricultural development of sufficient importance to the University of the Philippines and to the Philippine government to attract their participation.

18. The Farm and Home Development training program and other such educational techniques which might be developed should be integrated as effectively as possible with the activities of other action agencies concerned with extension such as the Bureau of Agricultural Extension (BAE), Presidential Assistant on Community Development (PACD), and the Philippine Rural Reconstruction Movement (PRRM).

*Business and Administrative Affairs*

19. The consultants were impressed with the interest of the College administration in the welfare of the nonacademic personnel and would encourage continued attempts to upgrade the competence of these employees by making salary adjustments on a selective basis in accordance with demonstrated abilities, skills, working habits and productiveness. Such salary adjustments, made in lieu of across-the-board raises, would give incentives for the most competent of the nonacademic employees to remain with the institution and to provide it with increased productiveness without a greatly expanded work force.

20. Since the policy of permitting revolving funds has been found to be so successful in some units of the College, consideration should be given to extending this privilege to additional operational units including the Service Division.

21. Every effort should be made to streamline and speed up the procurement of supplies and equipment by the College. Efforts to do so might include the establishment of a procurement office in Manila and the obtaining of greater flexibility in procurement policies for the Los Baños units of the University.

22. Further efforts need to be made to improve the efficiency of the accounting and control system of the College Business Office.

## PLANS FOR IMPLEMENTATION OF DEVELOPMENT PROGRAM

Following the report of the special review team of consultants, Vice-President Umali and his associates decided to update their proposal for a development program which had been prepared earlier in February, 1962. This was done by incorporating the major recommendations of the review team along with those in the earlier Cornell proposal into a revised "Proposed Development Program for the College of Agriculture, University of the Philippines" (a consolidated proposal was issued in August, 1962).

Some of the philosophy of the UPCA in building for the future is expressed in these excerpts:

"During its fifty-three years of existence, the U.P. College of Agriculture has achieved remarkable progress in teaching, research, and extension. It has greatly contributed in meeting the needs of the peoples of the Philippines and the newly emerging nations in Southeast Asia for economic and social advancement. Its influence is being increasingly felt in the technological development of these countries. Through its graduates, it is helping to supply the educators, researchers, technicians, agriculturists, and other trained people needed to provide the leadership in the rapidly developing agricultural economies in this region of the world.

"However, there will never be a time when the College of Agriculture will outgrow the need for development and expansion to serve not only the Filipino people and our Asian neighbors but possibly the whole of mankind. It cannot cease to grow and develop, if it is to keep pace with the challenges and responsibilities demanded by a dynamic world, if it is to continue meeting its obligations in educating leaders in agricultural sciences. It must build on present strengths, correct major weaknesses and deficiencies, continue to upgrade its manpower and physical resources, and always strive for standards of excellence in instruction, research, and extension so that it can truly perform its function as the leading agricultural college in the Southeast Asia region.

"We believe that the U.P. College of Agriculture exists to serve humanity. All other ends toward which its teaching, research, and extension activities may be directed are but means by which this ultimate goal can be attained.

"We firmly believe that the College is operated not to create an intellectual aristocracy nor to maintain a snobbish academic respectability, but to promote science and scholarship, to improve human welfare, and to advance the frontiers of knowledge. We hold that no community service is too undignified for the College to perform.

"The College is challenged to meet not only the needs of our people for social and economic advancement but also those of newly emerging nations of Asia which recognize that education is indispensable to their quest for independence, growth, and human dignity. The

ever-increasing number of Asians enrolling as undergraduate and graduate students, the increasing demands for research and service, the need for greater financial support, and the conflicting current concepts of higher education—all of these comprise the challenge to the College.

"Improvement of the College will result in a higher quality of institutional efficiency through the systematic development of competence in performing the new and varied tasks confronting higher education today. If the College were stronger and well developed, it could turn out the many trained technicians, educators, researchers, and scientific farmers needed by the government in the various industries in this country and in others.

"In the face of these new challenges and increasing responsibilities, we must move to use our resources and facilities to the fullest advantage. The College must be rededicated and reoriented to the wider and more complex context of a modern state of agriculture. It must deal with the needs and problems of the time with all the wisdom and discernment it can muster."

After distribution of the revised edition of the Proposed Development Program, the next step was a conference at Los Baños in September, 1962. This was arranged by Vice-President Umali to present the development proposal to representatives of the Ford and Rockefeller Foundations, Agency for International Development, Government of the Philippines, University of the Philippines, and Cornell University. All of those in attendance were very favorably impressed with the plans that had been developed and with the justification for the program. Cornell University was represented by Dean Charles E. Palm who gave enthusiastic support to the University's collaboration in this new program. Representatives of the Foundations reiterated their interest in providing support for many aspects of the proposed program, particularly those dealing with instruction, research, and extension, and pointed out the possibilities of the Philippine government obtaining a loan from the International Bank for Reconstruction and Development (World Bank) for physical improvement of the Los Baños campus. The groundwork was laid for continuing discussions between the two universities and the Ford and Rockefeller Foundations over the next several months.

Agreements were reached at this high-level meeting in Los Baños that the University of the Philippines would try to get incorporated into the national budget additional government funds for the development program of the College of Agriculture. Later it was learned they were successful in getting an additional amount of 1.7 million pesos for operating expenses incorporated into the FY 1963-1964 national budget.

There were also firm indications of support from both the Ford

and Rockefeller Foundations which were represented by Dr. George F. Gant, head of Ford's South and Southeast Asia Program, and by Dr. A. H. Moseman, Director of Agricultural Sciences, The Rockefeller Foundation.

Major costs for Cornell's involvement in the development program would probably be assumed by the Ford Foundation. A recommendation would be made to the trustees of the Rockefeller Foundation for funds to construct faculty houses at Los Baños to accommodate visiting professors and perhaps some local faculty members. The Rockefeller Foundation's support toward the training of staff members of the College at Los Baños would continue to be administered through the Foundation's regular fellowship program which they hoped to expand somewhat in 1963. Dr. Moseman indicated the Rockefeller Foundation would probably support research in their traditional way through research grants and perhaps locate two or three scientists in the development program at Los Baños. They would expect to review the areas of possible interest with Cornell and the other cooperating organizations before any definite plans were developed.

After his return from Los Baños, Dean Charles E. Palm asked Professors Brady and Turk to prepare a suggested budget and plan of operation that would implement Cornell University's responsibilities in the proposed program during the next five years beginning in 1963. Controller A. H. Peterson of Cornell University, who had been campus coordinator of the Cornell-Los Baños project between 1952-1960, assisted fully in the development of the preliminary budget and in reviewing the various steps essential for successful collaboration between the two universities.

Dr. George F. Gant of the Ford Foundation went to Cornell to review the budget proposals. This meeting was held in November 1962, and after Dr. Gant presented the general plans for support of the new program by the Ford and Rockefeller Foundations, the proposed budget and plan of operation were considered in detail. It was suggested by Dr. Gant that Cornell should plan to move into the proposed program gradually, reaching the desired level of visiting professors, consultants, and graduate assistants during the third year. The Ford Foundation was prepared to discuss a two- or three-year program and they might be willing to consider a grant that would provide for senior staff participation for a period of five to seven years or longer, recognizing that it would probably take ten to twenty years to meet the objectives of the program. In addition to the major emphasis on graduate education and research, it was suggested that an extension component be included.

This meeting in Ithaca was followed up with another one in New York City on December 19, 1962, which involved Dr. F. F. Hill, Vice-

President for the International Division of the Ford Foundation, and Dr. A. H. Moseman, along with other representatives of the Foundations, and Controller A. H. Peterson, W. K. Kennedy, Director of Research, and Professors N. C. Brady and K. L. Turk, Cornell University. The purpose of this meeting was to review all aspects of the proposed new Cornell-Los Baños project. Agreement was reached on the components of the proposed budget and the plan of operation.

#### OPERATIONAL GUIDELINES

A statement of "Proposed Principles to Guide the Cooperative Development of an Improved Graduate Education Program at Los Baños" was agreed upon as being conducive to sound program administration. These principles had been considered on numerous occasions earlier and it was felt they would make such a program attractive and worthwhile to Cornell University as well as to the University of the Philippines. The guidelines were discussed later with representatives of the University of the Philippines and there was general agreement on them as presented below:

1. The major objective of this proposed program *is the continued development of graduate education, training, and research at Los Baños.*
2. The proposed plan of operation involves three basic features:
  - (a) A mutual and integrated approach involving the U.P. College of Agriculture, Cornell University, private foundations, and the Agency for International Development (AID) that will provide for an expanded program in agricultural research, teaching, and extension *to develop further the U.P. College of Agriculture into a college of recognized stature in the region;*
  - (b) An opportunity for academic training and participation in research, extension, and on-campus teaching at Los Baños for Filipino and Asian staff and graduate students under their own environment; advanced training for the most outstanding of these will be provided in the United States; and
  - (c) Graduate education, research, and extension experience in the Philippines for American participants who are interested in careers in overseas agricultural development. These should be thought of as active participants essential to the overall success of the program.

While specific advances and improvements will be effected in physical facilities and equipment, in research, teaching, and extension accomplishments, and in financial support for the U.P. College of Agriculture, *the most fundamental and lasting effects will be on people—the staff, students and graduate participants—the education and training of people for leadership in the development*

*of the agricultural potentials of the Philippines and other developing countries.*

*An important feature will be the training of Americans for overseas agricultural service, an area now neglected by most American universities. Properly trained people for international agricultural development work are badly needed.*

3. Full realization of the basic objectives requires an integrated approach to resident teaching, research, and extension education under the administration of the U.P. College of Agriculture. The American contributions in all disciplines shall be coordinated by a single project leader who will serve as a special assistant to the Dean, U.P. College of Agriculture.

4. All staff and participants in this cooperative program will have formal and definite responsibilities to the U.P. College of Agriculture. These major responsibilities should be stated in writing so they can be well understood by all participants. While the recruitment and selection of the American staff will be the primary responsibility of Cornell, the U.P. College of Agriculture administration will be expected to participate in the selection of all visiting professors and other personnel concerned with this program.

#### SUPPORT FROM WORLD BANK INVESTIGATED

At about this same time, Vice-President Umali was conferring with representatives of the World Bank and with officials of the Program Implementation Agency, Office of the President of the Philippines, about the possibility of obtaining assistance from the World Bank to the development program. He enlisted the assistance of the Ford and Rockefeller Foundations in these early negotiations with the World Bank. Representatives of the Bank visited the Philippines and held discussions with high-level government officials and were fully briefed on the College of Agriculture's development program.

In order to keep all interested parties fully informed of developments as they occurred, Dr. Gant of the Ford Foundation arranged a conference in New York on March 8, 1963. Participants included representatives of the Ford and Rockefeller Foundations and Cornell University, along with Mr. Lionel Evans, Chief of the Agricultural Division of the World Bank. Based on his discussions with officials in the Philippine government and after three trips to Los Baños, Mr. Evans reported that the development project of the UPCA was good and either the World Bank or the International Development Association (IDA) might be interested in making a loan for its support. He was especially impressed with the anticipated cooperation of the Ford and Rockefeller Foundations and Cornell University with the University of the Philippines. Mr. Evans also reported that one of his colleagues was in the Philippines at that time, and after he returned they

fully expected to get approval to go ahead with an appraisal mission. This mission would be led by the newly formed Educational Division of the World Bank.

At this meeting Dr. Gant informed the group that the Ford Foundation had made money available, at the request of the University of the Philippines, to provide a consultant on campus development. Arrangements had been made for Mr. John M. Rowlett, partner in the architectural firm of Caudill, Rowlett, and Scott, Houston, Texas, to go to Los Baños and develop campus planning recommendations, including estimates of cost.

#### INPUTS FROM ROCKEFELLER FOUNDATION

Dr. A. H. Moseman informed the group that the houses and apartments for visiting professors and graduate assistants would probably be finished late in July or early August, 1963. At the request of Vice-President Umali, the appropriation from the Rockefeller Foundation for the construction of eight houses and six apartments was administered by the IRRI in order to avoid some of the government red tape and consequent delays.

Again it was pointed out that the Rockefeller Foundation had set aside funds to employ three staff members for special projects in close cooperation with Cornell. These would probably include a scientist to work on the corn project who would be located at Los Baños. A second scientist would cooperate in the development of a livestock research center in Mindanao. The third area was indefinite. Funds would be available for about 10 fellowships each year for the training of staff.

In addition to support for the College of Agriculture, the Rockefeller Foundation was also looking at the main campus of the University of the Philippines at Diliman. Discussions already were in progress with President Romulo for support in some critical areas, especially humanities and the medical school.

#### FORD FOUNDATION AGREES TO PROVIDE MAJOR SUPPORT

Speaking for the Ford Foundation, Dr. Gant emphasized that they were focusing on the UPCA for several reasons. With the IRRI now functioning, there was need for this strength in research to be matched in teaching. There was critical need for stronger educational and training resources in Southeast Asia, and Los Baños was the logical place. The Foundation was not committed to any specific amount of money but "would do what is prudently necessary on the assumption this was to be a ten- to fifteen-year program."

Budget discussions and negotiations resulted in agreement on the essential components of a prospective two-year grant to Cornell

University in support of the UPCA. These major components were as follows:

1. Twelve man-years of full-time professional staff including a project director and extension specialist; 8 part-time visiting professors, and 15 half-time research and teaching assistants (5 the first year and 10 the second). These persons would be selected by the New York State College of Agriculture, Cornell University, with the concurrence of the College of Agriculture at Los Baños.

2. Funds for a Filipino staff development program at Los Baños to be worked out jointly by the U.P. College of Agriculture and Cornell University. Also, support was included for 5 man-years of training in the United States, the candidates to be selected by the U.P. College of Agriculture with the concurrence of Cornell University.

3. Funds for research and development in the form of supplies, persons and other research support for projects and activities jointly agreed upon by the U.P. College of Agriculture and Cornell University.

4. Funds for equipment for the College of Agriculture at Los Baños to be selected jointly by that College and Cornell University, and to be procured on behalf of the U.P. College of Agriculture by Cornell.

The proposed grant would be made to Cornell University upon a request by the University of the Philippines, the money released annually upon receipt of budget estimates sent by Cornell to the Ford Foundation's representative in Kuala Lumpur, on the understanding that certain components of the budgets reflect the advice and concurrence of the College of Agriculture at Los Baños.

As a result of later discussions, however, between Dr. F. F. Hill, Vice-President of the Ford Foundation, and General Carlos Romulo, President of the University of the Philippines, and in response to a specific request from President Romulo, the decision was made that the proposed grant would be made to the University of the Philippines with the stipulation that a portion of the funds would be withheld by the Foundation for direct payment to Cornell University for its costs in the program and for purchase of equipment and books for the UPCA. The funds would be released to the UPCA and to Cornell University upon receipt by the Foundation of budget estimates prepared by the College and by Cornell covering their respective components of the program.

#### TWO-YEAR GRANT AND BUDGETS

Final decisions on the first two-year budget and the operational plan for cooperation between Cornell University and the University of the Philippines were agreed upon in conferences held in Los Baños on April 17-19, 1963. These conferences were held at the request of Vice-President Umali and involved the UPCA Directors of Instruc-

tion, Research, and Business Affairs, and the Dean's technical staff. Mr. Walter Rudlin, representative of the Ford Foundation in Kuala Lumpur, and Dr. K. L. Turk, Director of International Agricultural Development, Cornell University, represented their respective institutions. There was general agreement on the components as outlined above and in the addition of certain elements. Included among the American visiting professors was to be an architect-engineer to assist in the planning and supervision of the construction of laboratory buildings and utilities. The project would support one Filipino visiting professor, or post-doctoral fellow, at Cornell during the second year and each subsequent year of a continuing program. There would also be three man-years of Asian or other country visiting professors at Los Baños.

Vice-President Umali and others in administration in the UPCA outlined priority areas in teaching and research to be filled by Cornell visiting professors and consultants. Plans went forward for legislation to provide tax-exemption privileges for visiting professors and consultants and also for the importation of equipment and other materials essential for the development program. With anticipated approval of the grant by the Ford Foundation, both universities proceeded to develop detailed plans for initiation of the University of the Philippines-Cornell University Graduate Education and Research Program as rapidly as possible.



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## CHAPTER VII

# Planning for Cornell's Participation

### *Environment for Graduate Studies at Los Baños*

From its beginning in 1909, the U.P. College of Agriculture was primarily an undergraduate teaching institution until graduate studies were expanded in the 1950's. The College has long been a leading school in the region and has attracted students from other countries, especially Thailand, Indonesia, and Vietnam.

The demand for men and women trained at advanced levels in all agricultural disciplines throughout Southeast Asia, especially in the Philippines, has been constantly expanding since World War II. Almost all candidates for this training went to the United States, Europe, or other more highly developed countries. Although in most cases this provided good training, much of the research done in sophisticated laboratories and in different climatic and other environments was on problems that often had little relation to agricultural problems of their own countries. Furthermore, these educational programs abroad were very expensive.

Many of the faculty members at Los Baños had always been involved in some research, much of it with undergraduate theses, but invariably on top of heavy teaching loads of undergraduate teaching. There had been no central experiment station until one was established during the first Cornell-Los Baños program, when also some of the staff were given research responsibilities.

As the number of candidates for graduate education continued to increase, it became apparent to agricultural leaders that the most practical solution to the problem was to strengthen the faculties and facilities of the stronger universities in the region so that much of the needed advanced training could be done there. More than 100 members of the faculty in agriculture at Los Baños had received advanced training abroad since World War II. With these young scientists on its staff, Los Baños was a logical place to develop graduate studies much further.

Alongside of the College of Agriculture is the College of Forestry, both units of the University of the Philippines. As these two Colleges grew in stature, other research and educational institutions sought association with them to share the knowledge and experience of sci-

entists and teachers and the facilities. Institutes and centers to join the complex were the Forest Products Research Institute; Community Development Center, Agricultural Credit and Cooperatives Institute, the FAO Dairy Training and Research Institute, and the International Rice Research Institute. Such a community of scholars and teachers from many countries strengthened Los Baños as an educational and cultural center.

All together these units form the Los Baños "complex," the central aim of which "is to contribute to knowledge and ideas which have no boundaries, and, more specifically, to contribute to the building of an efficient, dynamic agriculture in the Philippines and other Southeast Asian countries so their expanding millions can live a life of abundance, freedom and dignity."

With this framework of institutions, Dean D. L. Umali and his faculty evolved their Five-Year Development Program for the College which included a plan for a sister-university relationship with Cornell University that would further develop graduate education and training, research, and extension at Los Baños.

### *Objectives of UPCO Program*

As mentioned briefly earlier, agreement was reached in discussions involving representatives of the University of the Philippines, Cornell University, and the Ford and Rockefeller Foundations that the program would provide mutual efforts directed toward the education and training of people for leadership in the development of agricultural potentials of the Philippines and other low-income countries. Specifically, the program would have these objectives:

1. To cooperate in the campus development and expanded educational, research, and extension programs of the College of Agriculture, University of the Philippines.
2. To train Filipino, other Asian and American students for leadership in rural development through a joint graduate education and research program; and
3. To strengthen the International Agricultural Development Program of Cornell University for the discharge of its responsibilities under this program.

### *Plan of Operation to Meet the Objectives*

As the plan of operation was developed, it was proposed and agreed upon by members of the administration and faculty of both cooperating universities that a desirable approach in this educational and research program would be for Cornell to provide visiting professors, consultants, and graduate assistants from major interdisciplinary or

resource units, including (a) animal sciences, (b) plant sciences, (c) natural resources, (d) food and nutrition, and (e) socio-economics and communications. It was felt that a team effort would help avoid some of the fragmented approach typical of many college contracts that were in effect between American and foreign universities.

Each unit would consist of a coordinated group of Filipino, other Southeast Asian, and American personnel working together on problems of common concern in teaching, research, and extension. Included in each group would be (1) one or more staff members of the University of the Philippines or other Southeast Asian universities, (2) one or more Cornell professors, (3) at least four graduate students from Southeast Asia, and (4) at least two American graduate students.

Each unit would have definite objectives and procedures agreed upon mutually by the Colleges of Agriculture of the University of the Philippines and Cornell. These objectives and procedures would be coordinated with those of other units and of the overall program.

A brief description of the responsibilities of each unit as they apply specifically to Southeast Asia follows:

#### 1. *Animal sciences*

This unit would provide an adaptation of basic research and teaching skills in animal science to the specific problems of the Philippines and Southeast Asia. The basic problems that would fall in this unit were: (a) poor feeding and nutrition of livestock; (b) low productivity of native livestock and lack of adapted breeds of high productivity; (c) lack of knowledge of livestock husbandry and management; and (d) disease and insect pests. Research and education programs would need to be directed primarily at these problems. Over a period of several years it would involve participation of animal nutritionists, animal breeders and geneticists, specialists in livestock production and management, and veterinarians. Coordination would be expected of activities within the animal science unit and between those in allied subjects such as forage production, soils, and food science.

#### 2. *Plant sciences*

Students would be given basic training in the physical and biological sciences and an opportunity to use this training in research and teaching in the plant sciences under the environmental conditions in their region. Research methods in subjects such as crop breeding, culture, protection, and utilization would be taught under tropical conditions. Production specialists dealing with each major crop group, plant breeders, plant pathologists, weed specialists, and botanists or others in basic areas should be planned in succession. The scheduling of visiting professors and consultants in this unit should be integrated with those in other units, especially soils and fertilizers, and marketing, food science, and animal science.

### 3. *Natural resources and physical sciences*

This resource group would have the responsibility of training Filipino, Southeast Asian and American students in natural resources evaluation, conservation, utilization and planning. Studies would be made of natural resources of the region which are essential for agricultural development. These resources would include soils, land, forests and other vegetation, water and climate, and would be evaluated in terms of their potential for development. Human resources would be considered insofar as they influence the utilization of the other resources. Students and staff would be trained to do resource planning under the conditions present in their own countries. Techniques and methods used successfully in the United States and elsewhere would be adapted to the situation in the region. Disciplines which would contribute staff and training for this unit would include soil science, conservation, agricultural economics, meteorology, agricultural engineering, chemistry, physics, and mathematics. Teams from two or more disciplines would be organized to work on specific problems and would coordinate their activities with those of other units.

### 4. *Food and nutrition*

The food science unit would include scientists from four disciplines: food processing (engineering), food analysis, bacteriology, and nutrition. This unit would contribute to a balanced program for agricultural development through improving the utilization of farm products. In addition to these economic benefits, food science would contribute to public health through improvements in sanitary practices and through increased availability of nutritious products. Training programs in food science would qualify graduates for lines of work such as the following: development of foods of high nutritional value, appraisal of the nutritional status of populations, definition of quality and sanitary standards, testing of new varieties for processing suitability, analysis of spray residues, and the preparation of bulletins on home preservation for use by extension.

### 5. *Socio-economics and communications*

This group would provide research and teaching experience and training in social, economic and communications disciplines as they apply to the agricultural development problems of the Philippines and of Southeast Asia. Economic studies would involve subjects such as: economics of development, farm management, marketing, cooperatives and farm credit. These would be coordinated with studies in social sciences on social structure and value systems, human resource analysis, rural living facilities, and organization methods. Communications would be studied in terms of the spoken and written word as well as the transportation of people and goods. Areas for study would include communications skills, publicity and publication services, and extension teaching methods. This unit also would provide training in public and personnel administration and

program planning. The specific disciplines represented would depend upon the problems of the region but a team approach would be used to provide the needed research and teaching.

Later, as the program developed and the staffing pattern reached its optimum in the third year, a sixth resource field was included, *crop and animal protection*. This involved primarily the disciplines of entomology and plant pathology, but also some aspects of the plant sciences, weed science and animal sciences.

### *Staff Recruitment and Participation*

#### FILIPINO STAFF

Since the expanded graduate training program would involve all major subject matter departments of the UPCA, it was expected that the entire professorial staff would participate. Specifically, U.P. professors would be engaged in offering advanced courses for Filipino, Southeast Asian, and American graduate students. They would direct the research and thesis work of these students and would participate with others, including the visiting professors, as members of teams in planning and directing research and teaching programs.

Some of the Philippine staff would be selected by joint agreement to come to Cornell as visiting fellows, research associates, or professors. While there, they would be given opportunities to give lectures, write books, participate in seminars and other graduate education activities and to attend lectures of interest to them. They would be assigned to subject matter departments and would be given appropriate appointments on the Cornell staff.

It was likely that many of the current assistant instructors, instructors, and research assistants on the College staff would be selected to participate in this program as graduate assistants. In keeping with plans to upgrade markedly the training of the academic staff of the College, it would be appropriate to select the more promising of these staff members for advanced studies in the Philippines and, in some cases, in the United States as well. Use would be made of their research and teaching experience at the same time they were improving their basic training.

#### STAFF FROM SOUTHEAST ASIA

Selected staff from neighboring Southeast Asian countries would be given an opportunity to participate in the expanded graduate training program in three ways: (1) some would be invited to join the UPCA as visiting fellows or professors; (2) a few would be invited to go to Cornell as visiting staff members; and (3) others would be offered graduate assistantships and fellowships to help finance their graduate education.

These Southeast Asian participants would be selected by appropriate staff members of the UPCA and Cornell.

#### AMERICAN STAFF

It was the intent that this agricultural development training and research program be an integral part of Cornell's agricultural research, teaching, and extension activities. Insofar as possible, staffing would be done with Cornell professors rather than with personnel borrowed from other institutions. As part of the continuing program, the department concerned would be expected to furnish a member of its staff (on a rotating basis) to this program. This situation would encourage expanded and effective teaching activities on the Cornell campus and continued interest in the Philippine segment of the program.

The number of American professors assigned to visiting positions at Los Baños would vary according to program needs. It was expected that at least one man in each of the six units would be needed in addition to the project leader. These regular staff members would be supplemented by short-term professors or consultants, who would go to the Philippines for periods of from a few weeks up to several months. These short-term assignments preferably would be given to staff who already had experiences in Southeast Asia and could give aid in specific research or teaching areas or evaluate the results of agricultural development programs previously inaugurated. They would provide extra support or balance for one or more of the resource units.

The American visiting professors would be expected to work closely with their Filipino and other Southeast Asian counterparts in carrying out an expanded graduate training program at the UPCA. They would work as a team in providing course work and especially research and teaching participation for the Southeast Asian and American graduate students.

Of significance was the philosophy that visiting professors would be *active participants* in all activities concerned with the further development of graduate education and research at Los Baños and *not just serve as advisors*. They would be selected for their demonstrated performance in teaching and research and their ability to inspire and direct research by graduate students.

#### UNIQUE FEATURE IN GRADUATE EDUCATION

One of the unique features of the UPCO program was the plan to include graduate student participants, both from the UPCA and from Cornell University. They would serve as teaching assistants and gain experience in research with their cooperating professors and use an appropriate sector of the research for their Ph.D. thesis.

Graduate students learn to do research by doing it under the direction of experienced investigators. The research output of professors is increased by the assistance of enthusiastic young assistants. No better or cheaper way of doing research and of training research workers has yet been devised. Experience has proved that if properly focused and directed, such research should not be looked upon as an expense but as an investment in development which in time will be among the most profitable a young nation can make. (See Appendix E for outline of Program of Graduate Assistants).

#### PHILIPPINE GRADUATE ASSISTANTS

Carefully selected students from the Philippines, including young staff members from other Southeast Asian countries, would be given an opportunity to study for the M.S. degree at the UPCA. After earning this degree some of these would be selected, approximately five each year, to be sent to Cornell for course work and other requirements (except thesis) for the doctoral degree. While at Cornell for approximately two years, they would serve as teaching and research assistants in their respective departments, learn various research and teaching techniques, and plan their thesis research to be done back at Los Baños. After returning to the UPCA these graduate assistants were to be given two years to conduct their thesis research under the direction of Cornell visiting professors and/or Filipino professors. They would work on problems of significance to Philippine agriculture and thus contribute to the development of their own university and country. Support for their thesis research would give them a two-year start on their research program and hopefully would avoid some of the frustrations commonly encountered by fresh Ph.D.'s back in their own environment after several years of advanced training in the United States. In addition, this procedure would provide well-trained and productive UPCA faculty for the future.

#### AMERICAN GRADUATE ASSISTANTS

There was a growing requirement on the part of universities in the United States to train more of our own nationals by utilizing experience abroad to help prepare them for future service in the modernization of world agriculture. So, Cornell graduate assistants with interests in careers in international agriculture would be selected to participate in the program.

These graduate assistants would complete all course requirements for the Ph.D., including the subject matter examination, and obtain training in research and teaching techniques before going to Los Baños. Also, they would be encouraged to participate in seminars on Southeast Asia to help prepare them for work in that region. Prior to de-



Dean Umali and the Special Review Team discuss the College's Development Program with Vice-President Pelaez, Government of the Philippines. (Shown left to right: Mr. Pelaez, N. C. Brady, R. D. Osler, K. L. Turk, and D. L. Umali.)



The International Rice Research Institute, located on the campus of the College of Agriculture, was inaugurated in February, 1962. Its success in the development of new high-yielding rice varieties helped make Los Baños the rice research and training center of the world.



*The Farm and Home Development Program expanded rapidly and contributed effectively to farmer acceptance of improved practices. Professor L. P. de Guzman, Officer-in-charge (second from the left), discusses some practices with barrio farmer, a field technician, and Visiting Professor M. C. Bond.*



*Overseas participants at an outdoor seminar sponsored by UPCA Office of Student Affairs.*



*Vice-President Umali (right) visits Cornell University to review plans for the cooperative Graduate Education Program. Here he obtains briefing on his itinerary from K. L. Turk (center), Director, Program in International Agriculture, and Dean Charles E. Palm.*



*Carlos P. Romulo, President of the University of the Philippines, hands the pen to President James A. Perkins of Cornell (second from left) to sign the Memorandum of Understanding to continue the UPCO program.*



*Vice-President Umali explains the plans for the U.P.-Cornell Graduate Education Program to Foundation Representatives. (Left to right: K. L. Turk, Cornell University; A. H. Moseman and J. G. Harrar, Rockefeller Foundation; F. F. Hill, Ford Foundation; and Richard Bradfield, Cornell University and Rockefeller Foundation.)*



*This aerial view shows the campus of the U.P. College of Agriculture in 1965 before the rapid growth and development of new buildings under the Five-Year Development Program. (Contrast this with other stages of development. See pages 47 and 395.)*

parture the thesis research project was to be approved and arrangements made for adequate supervision as well as necessary equipment and supplies.

Each of the graduate assistants was expected to spend approximately two years at the UPCA. They were to be assigned to their respective subject matter departments and expected to spend up to 20 hours each week assisting the program of the UPCA in teaching and research in addition to their own thesis project.

It was understood that Cornell graduate assistants would generally do their thesis research under the direction of Cornell visiting professors and, for the most part, jointly with Filipino professors. It was felt that one of the important functions of graduate assistants would be to expedite the work of visiting professors to make their work more effective. Thus, the Cornell graduate assistant would be a vital link between the visiting professor and the day-to-day supervision of research and between the Filipino graduate assistants and the research. They could also play significant roles as teachers of research attitudes, techniques, and scholarly pursuits appropriate to an institution of higher learning.

### *Creating an Atmosphere for Graduate Education*

The development of a Graduate School in an undergraduate institution marks a distinct step forward in its evolution into a true university. In isolated colleges, primary emphasis naturally is placed on undergraduate instruction, on developing within the student a broader but still very much simplified awareness of man's intellectual heritage. The student becomes familiar with a limited fraction of what has been learned in the past, often acquiring a rather static picture of the accumulated store of knowledge. He learns by rote and has little understanding of the application of knowledge and how to deal with the problems of life in a modern, changing world. Such was the situation in many areas at Los Baños.

The undergraduate college educational program in the Philippines suffers from the fact that students usually enter college with only ten years of schooling instead of twelve. The public elementary schools provide only six years of education followed by four years in high schools. Not only does the entering freshman from the Philippines have two years less education than students entering college in the United States, but often the quality of instruction in many of the high schools is not very high. The student normally completes the requirement for the B.S. degree in four years and, if he goes on to graduate school, will enroll in graduate studies two years earlier than a student with a B.S. degree from a university in the United States. It is surpris-

ing that so many of these graduates from the Philippines do so well in graduate schools.

One of the major problem areas as the UP-Cornell Graduate Education Program was being initiated occurred in the basic sciences of Chemistry, Mathematics, Physics, and Biology. Even though graduate studies had already been started, course offerings in these fields were designed primarily to fit the needs of undergraduates. Even at this level, there were many deficiencies, and students were not getting the quality of education necessary to prepare them for effective work in agricultural development. Quality of offerings in the basic sciences had to be improved and expanded at the undergraduate level and at the same time provide the depth of instruction in advanced courses to meet the needs of a wide range of graduate students in many disciplines. Advanced courses in these basic science fields are essential for students in nearly all disciplines, especially in the plant and animal sciences, soils, agricultural engineering, entomology, and plant pathology.

One sensed the need to create an atmosphere for high-quality graduate studies that would be different and distinct from undergraduate teaching. Many of the graduate courses at the M.S. level were "more of the same," with no real distinction in quality or level of instruction. The size of the graduate faculty was relatively small, the laboratories were not well equipped, and space and other facilities for research were limited. Much of the research was fragmentary and limited in scope. And many of the projects were not sufficiently comprehensive to be of value to the farmer and to have an impact on agricultural development. Likewise insufficient financial support was provided for teaching and research at the higher levels.

Such were some of the problems facing the young graduate school at Los Baños and the teams of visiting professors and graduate assistants. By working closely together at all times it was hoped that a new atmosphere and philosophy so essential for success in graduate education and research in the University would be developed and maintained.

**PHASE II: 1963-1972**

**THE U.P. - CORNELL  
GRADUATE EDUCATION  
PROGRAM**



## Chapter VIII

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## CHAPTER VIII

# Initiation of the Program — Getting Tooled Up

The joint UP-Cornell Graduate Education Program was initiated in September, 1963, with the arrival in Los Baños of Dr. and Mrs. N. C. Brady. Professor Brady had been one of the chief architects of the plan of operation for this new program, and it was fortunate that he could spend two months as the Project Leader in getting the program organized and operating. Next came Dr. K. L. Turk who after a period of two months was followed by Dr. Richard Bradfield for six months. The first longer-term leader of the program was Dr. H. L. Everett who arrived on July 2, 1964.

The first visiting professor, Dr. Gilbert Levine and his family, arrived on September 24, 1963, for work in agricultural engineering. Dr. M. C. Bond and Mrs. Bond had been on the UPCA campus since the summer of 1962 on a grant from the Council on Economic and Cultural Affairs working in farm and home development and extension. Professor Bond's activities were transferred to the new Cornell-Los Baños program effective September 1, 1963.

### *Relationships Established*

Several important relationships were established early in the program that demonstrated complete cooperation and mutual confidence between the UPCA administration and faculty and the Cornell project leaders and visiting professors. Immediately after his arrival, the Project Leader was invited to serve on the Directors' Council of the College. This permitted an opportunity to get an insight into the many problems faced by the Dean and his Directors in administering a lively and growing institution. Also, it made it possible for the Project Leader to understand better the relationship of the UP-Cornell Graduate Education Program to the overall functions and activities of the College. Further, it kept the Project Leader informed on all phases of

College administration and in some cases provided an opportunity for him to make suggestions useful to the Vice-President and his top associates. The pattern also was established for the Project Leader to meet regularly with the Dean's Executive Committee, composed primarily of department heads, which provided a direct linkage with all departmental activities.

### *Campus Development Started*

The first major activity dealt with the development of preliminary building plans for presentation by the College to the World Bank in support of their loan request. The Vice-President had organized a Technical Committee which developed preliminary plans for each of the new buildings, following rather closely recommendations of the Special Review Team (N. C. Brady, R. D. Osler, and K. L. Turk) as modified by the architect-consultant furnished earlier by the Ford Foundation. After thorough discussions between the Project Leader and members of the Technical Committee, a procedure was developed to modify the preliminary plans and take a more deliberate approach to the planning of the new buildings to help assure adequate facilities for both research and teaching. The procedure was explained in detail to all departmental representatives and arrangements were developed for joint meetings between them and members of the Technical Committee. Professor Levine was asked to work very closely with the Technical Committee and with departmental committees in the preparation of building plans and lists of equipment.

The Technical Committee, along with all of the departmental committees, did a tremendous amount of work on the preliminary drawings and plans. After unsuccessful attempts to obtain a consulting architect from the United States to develop the preliminary sketches for new buildings and renovations required by the World Bank, the Cornell Project Leader recommended, and the Vice-President agreed, that a Philippine architect should be requested to do this job. Accordingly, Mr. C. D. Arguelles agreed to prepare preliminary drawings based on the space analyses and plans submitted by the UPCA staff. This was accomplished over the next several months. In order to meet the legal requirements of the Bank, it was necessary to get a law passed authorizing the loan, providing the necessary exemption of import duties, provision for repayment of the loan, and the appropriation of a matching fund by the Philippine government. The bill was passed by both Houses of Congress and was signed by President Macapagal on May 22, 1964. Following this, General Carlos P. Romulo, President of the University of the Philippines, went to the United States to complete the negotiations for the loan.

The World Bank loan made available up to \$6,000,000 over a five-year period and was the first educational loan made by the Bank. The matching fund from the Philippine government brought the total development fund up to \$12 million. This was a substantial amount of money but there was a feeling it would be insufficient to build all of the buildings likely to be needed by the rapidly developing UPCA over the next decade. It would provide for the structures and services most urgently needed, however, and promised to give the College one of the best physical plants of any agricultural college in Southeast Asia.

### *New Equipment and Supplies Ordered*

A second major activity requiring a lot of the Project Leader's time in the early stages of the UPCO program was compilation of lists of equipment and supplies for the day-to-day teaching and research needs of the staff. Along with a capable member of the Technical Committee, the Project Leader visited each department to observe the equipment currently being used and to discuss with departmental personnel their equipment and supply needs. They were impressed with the high proportion of the equipment already in the laboratories which was inoperative because of a lack of spare parts. Problems in maintenance were clearly evident, but the situation largely resulted from the small amounts of funds available for equipment replacement during the past several years.

Priorities were set up for the purchase of supplies and equipment for the UPCO program: (1) repair and renovation of existing equipment; (2) equipment badly needed for projects already under way; and (3) equipment needed for the general operation of teaching and research laboratories. For those items to be acquired in the United States, arrangements were made for all orders to be handled by the purchasing department at Cornell University.

### *Emphasis on Improvement of the Library*

Each of the early Project Leaders shared the concern of Vice-President Umali over need for improvements in library facilities and in building up and maintaining a higher-quality library for the Los Baños units. There was complete agreement that a high-quality library is a must for graduate studies and that generally a university will be no better than its library.

Two different groups of consultants had reviewed and surveyed the needs of the library early in 1963 and recommendations were made on improvements needed in physical facilities and in the collections of books and journals. The consultant of the Ford Foundation recom-

mended that Cornell should supply a short-term library consultant to advise on the library collections and plans and that the College should allocate a larger share of the new money to library collections and services.

It was readily apparent that the College library was receiving very meager support from the University of the Philippines at Diliman. One of the problems was that the College library was a unit of the main library of the University at Diliman and, therefore, did not come under the direct administration of the Vice-President at Los Baños. It was difficult to get increased support for the library in the annual recurring funds available to the College.

Many discussions were held on general policies that should be followed for the best utilization of funds for library improvement provided by the Ford grant. The policy adopted was that the UPCO project funds should be expended primarily to help enlarge library holdings through purchase of back issues of important research journals and of books known to be of importance and of value in the Graduate Education Program as well as for undergraduate students. Regular journal subscriptions would be handled by the University library funds.

### *Utilization of Departments in the Budgeting Process*

Soon after his arrival the Project Leader was requested to make specific suggestions on the budget requests that had been prepared by the Vice-President for the fiscal year 1964-1965. This was important in developing relationships and provided an opportunity for penetrating questions and discussions on critical problems in administration of the College. Perhaps the most significant among these was that *excellence* and *quality* should at all times be uppermost in the minds of the College planners and budget-makers. The College must lead the way in breaking some of the traditional patterns of operation of government agencies. Greater concern should be felt for the efficient operation of the physical plant and research laboratories. A new appreciation for the place of utilities, equipment, and supplies as well as *people* must be developed among the staff of the College.

A second point which was emphasized was the importance of the departmental unit in the budgetary process. Greater responsibility should be accepted by department chairmen and their staff in the whole budgeting procedure. Emphasis was placed on starting the budgeting process at the departmental level to give scientists and professors an opportunity to contribute their opinions and a feeling of responsibility for the running of the College. This would help build morale and contribute to the excellence to which the administration was committed.

### *Steps Taken to Improve Quality of the Faculty*

Early in the academic year 1963-1964, Vice-President Umali informed the College's Executive Committee that he was taking steps to upgrade the training of the College faculty. He and the directors were concerned about the competence and training of junior members of the staff, including assistant instructors, research assistants, and instructors. Many of them had little advanced training and, furthermore, there was concern that only a relatively small number had done anything to improve their education even though they had been on the staff for five to ten years. It was felt that many instructors and other junior staff did not have the capabilities for moving up through the academic ranks and should not be encouraged to take graduate work.

The Vice-President made it clear that by the end of the five-year development program his goal was to have all members of the faculty with advanced degrees—55 per cent with the M.S. and 45 per cent with the Ph.D. In order to achieve this goal it was recognized that the rate of training faculty members abroad at the Ph.D. level would have to be accelerated and the most capable of those with the B.S. degree would have to concentrate on getting an M.S. at the UPCA.

As the first step toward faculty improvement, the Vice-President appointed a Faculty Committee on Faculty Standards and requested the Project Leader to serve as chairman. It became commonly known as the "Hatchet Committee." Some of the salient facts brought together were:

1. Only 13.6 per cent of the academic staff held the rank of assistant, associate or full professor. (This included those in administration.)
2. Of the academic staff, only 33.2 per cent held advanced degrees (24.2 per cent M.S. and 9.0 per cent Ph.D.).
3. Among the academic staff with B.S. or A.B. degrees, only 19 per cent had undergraduate grade point averages of 2.0 or better. (This was significant since the graduate faculty had recently adopted a policy that applicants for admission to the graduate school must have grade averages of 2.0 or better.)

With two-thirds of the faculty holding only the B.S. degree, it was obvious that the academic training of the faculty of the rank of instructor and below should be scrutinized carefully and steps taken to improve the training of the most capable of this group of staff. It was recognized that the goal of upgrading the academic training of the College faculty was an ambitious one. In the opinion of the Committee, the goal would be attained only if prompt action were taken by department heads and administration to evaluate junior faculty members, to insist upon advanced training for the most capable and willing ones, to

transfer others to nonacademic classifications, and to release non-productive personnel from the College staff.

### *Short-Term Visiting Professors and Consultants Served Important Functions*

During the first year there was a large number of requests from the UPCA administration for short-term consultants in specific areas of concern to the College in its development program. These included consultants in food science and technology, agronomy-vegetable crops, animal sciences-entomology, business affairs, and institutional management.

Prior to their travel to the Philippines, all consultants, as well as visiting professors and graduate students, were given thorough orientation on the program, including its objectives, plan of operation, housing, and background information on the College and the Philippines.

Upon the arrival of each consultant at Los Baños, the Dean appointed a committee of the College faculty and staff to work with the consultant in the special field of his interest. Throughout each assignment problems and possible solutions were discussed fully and frankly. Toward the end of each consultant's stay, the Dean arranged for a verbal report before his Directors' Council at which the recommendations of the consultant and his committee were presented. A final written report was prepared by the committee for future study and use. Both consultants and committee members expressed satisfaction with the procedures followed. The only common criticism noted was that the time available was too short to do all that needed to be done.

Most of these committees working with the consultants arrived independently at a few common conclusions and recommendations which are worthy of special attention. There was still a strong tendency to centralize much of the decision-making on departmental affairs in the central administrative offices. As a result, the administration tended to bog down under excessive loads of minor details with little time for many of the broader and more important problems which cannot be delegated to others. At the departmental level, the heads often felt frustrated because their efforts bore so little fruit. Decisions were made which were at variance with their recommendations, often without explanation. It was felt that "freedom with responsibility," if applied more widely, would tend to develop stronger departments and department heads.

The tendency to centralize decision-making was a policy of long standing and seemed to apply across the board; the selection of fellows, appointment of staff members, formation of budgets, and expenditure of funds were all frequently mentioned as examples.

Many of these administrative problems were examined in depth by Mr. R. L. Walsh, Consultant in Business Affairs. At that time he was Director of Finance, Business Office of the State Colleges, at Cornell University. The problems were sufficiently numerous and involved to justify a thorough study by a professional management firm, specializing in university administration. It was recommended that it should be extended to include relations with the Diliman campus of the University.

In the judgment of these committees and the consultants, the Los Baños campus of the University had outgrown business office procedures which worked reasonably well in earlier years.

### *Association of Colleges of Agriculture in the Philippines Formed*

An example of timely and excellent leadership by Vice-President Umali and his associates was the formation of the new Association of Colleges of Agriculture in the Philippines (ACAP). This idea had been discussed for several years, so Dr. Umali took the initiative and arranged a successful conference of representatives of agricultural colleges, sponsored by the UPCA, to be held at the College on January 2-4, 1964. Invitations were sent to twelve institutions offering training in agriculture at the college level, and eleven of them sent representatives.

The objective of the conference was to organize an Association of Agricultural Colleges in the Philippines for the purpose of:

1. Considering common goals and problems pertaining to the promotion of effective instruction, research, and extension in agriculture.
2. Formulating or promulgating plans, programs, of memoranda of understanding that will enable the member institutions to achieve their goals.
3. Exploring ways and means by which member institutions can contribute effectively to the socio-economic advancement of people.

Working committees discussed the organization, policies, existing programs, and problems in each institution with respect to instruction, research, and extension in agriculture and the role of expanded work in home economics. Mechanisms for collaboration were explored. A constitution and by-laws was adopted. Vice-President Umali was elected the first President of the new Association, and Dr. M. V. Jarmin of the UPCA Department of Agricultural Education was elected Executive Secretary-Treasurer. Thus, ACAP was born with the hope and expectation that it would have far-reaching effects on agricultural education and development in the Philippines.

Quite a large proportion of the faculty at the other colleges are graduates of Los Baños and they probably will continue to look to the

UPCA for most of their new faculty members. It was felt they needed professors with more graduate training and that through cooperative relations with the UPCA opportunities for graduate study could be provided. Also, cooperative research and extension relationships could be developed.

### *Organizational Changes and Programs*

As the Five-Year Development Program of the UPCA was unfolding, there were many discussions and proposals for additional activities and new departments in the U.P. College of Agriculture. Some of these are reviewed here.

#### **RURAL SOCIAL SCIENCES**

Vice-President Umali already had organized a Social Science Research Committee on the campus with responsibilities to determine the social science research which the College of Agriculture had the competency to carry out. Dr. G. F. Saguiguit was given the responsibility for providing administrative assistance to this group.

Serious consideration was being given to the possibility of forming a new Department of Social Sciences. Advantages that were put forth were: (1) This would give the social scientists more of a feeling of professional pride as part of a college in which biological sciences tend to dominate; and (2) It would join together in an administrative unit those concerned with the rural social sciences and strengthen their teaching and research functions.

The major disadvantage described was that the proposed new Department of Social Sciences would weaken the departments within which social scientists were currently working. Many felt that it would not be wise to strip several departments of their most competent people in order to set up a new unit. Regardless of whether a new department was established, the Cornell project leaders and other staff strongly supported plans for the College to utilize more effectively the talents of the rural social scientists and to bring about coordination with other groups in the Philippines that were concerned with rural development.

#### **APPLIED MATHEMATICS ESTABLISHED AS A NEW DEPARTMENT**

Faculty members in the physics, mathematics, and meteorology divisions of the Department of Agricultural Engineering requested that their units be organized into a separate department. The staff members already were physically separated from their colleagues in agricultural engineering, and there was a marked need for strengthening these basic science areas.

This request was acted on favorably and the Department of Applied Mathematics was established on August 1, 1964, with Dr. A. D. Yniguez as head. The different divisions of the new department included mathematics, physics, and statistics, with instruction as the major function.

#### PLANS FOR EXPANSION OF FOOD TECHNOLOGY

Preliminary plans already had been made for a Department of Food Technology through expansion of the staff and program that were already functioning in a modest way in the Department of Agricultural Chemistry. A short-term visiting professor (consultant), Dr. D. B. Hand, Head of the Department of Food Science and Technology, New York State Agricultural Experiment Station (Geneva), worked with the Committee on Food Science and Technology in the development of an expanded program to meet the needs of the Philippines in this area.

After a careful review of the need for training and research in food science and technology in the Philippines, the committee recommended that: (1) a new department be established in the UPCA; (2) a new building be constructed to provide the necessary teaching and research facilities; and (3) a curriculum be developed for training at both the undergraduate and graduate levels. Plans also were developed for a continuum of visiting professors in this field, but no decision was made by the administration at this time on departmental status.

#### CORN PRODUCTION PROGRAM ORGANIZED

Important relationships for the improvement of the College's corn production program were developed in December 1963, resulting from visits of Dr. Robert D. Osler and Dr. Ernest W. Sprague of the Rockefeller Foundation. They met with college staff and administration, including the Cornell Project Leader, and reviewed plans for the regional corn program, with the Center located in India, and procedures for participation by the various cooperating countries. After visiting the several departments concerned and holding further discussions with staff members, Dr. Osler and Dr. Sprague reviewed their observations and made these suggestions:

1. The College needs redirection in its corn program. It should start on a modest scale and grow and develop.
2. Emphasis needs to be given to marshaling people for concentrated work on corn from several departments, especially plant breeding, agronomy, soils, plant pathology, entomology, and botany.
3. The basic need is for continuity of able leadership to help plan the program, buildings and equipment, and ability to see it through for a period of years. The leader needs to have lots of energy, must know how to work, and know how to grow corn if he is going to develop field tests and stations and give the overall leadership necessary.

4. A key man should be sent to India for a six-months' training period under Dr. Sprague at the Corn Production Center. Also, there is a possibility that Dr. Sprague might be able to come to Los Baños for a period of six weeks to help set up plantings for the first year under the regional program.

Vice-President Umali took quick action and outlined steps that would be followed: (a) request the services of Dr. Sprague; (b) appoint a college leader; (c) apply for inclusion of the UPCA in the regional cooperative corn program for Asia; (d) redirect the interests of some of the young staff now in the United States for advanced training toward corn breeding and corn production; and (e) improve the corn plots at the College through land-leveling and improved cultural practices.

Dr. Sprague returned to the College as a consultant and spent approximately six weeks in March, May, and June, 1964, assisting with the initiation of an expanded corn production research program at Los Baños. He lived in the UPCO barrio and was an integral part of the program. This later proved to be one of the most significant projects of the College in its role and influence on national agricultural development.

#### TRANSFER OF VETERINARY COLLEGE TO LOS BAÑOS STUDIED

In November, 1963 the Cornell Project Leader was requested by Vice-President Umali to assist in preparation of a proposal to transfer the College of Veterinary Medicine at Diliman back to Los Baños where it had been prior to World War II. This would have some advantages to both colleges, but several factors were pointed out as being essential: (a) improvement of the quality of faculty; (b) size of the faculty would need to be increased; (c) provision must be made for adequate funds for additional positions, new buildings, laboratories, clinics and animal isolation quarters; and (d) adequate operational budget. If these conditions could be met, then the advantages of having the College of Veterinary Medicine located at Los Baños would outweigh the disadvantages.

This idea was pursued for several years; an outside review team was brought in by the Veterinary College, but up to 1973 the transfer has never been made due primarily to objections by the veterinary faculty.

#### ANIMAL RESEARCH INSTITUTE IN DAVAO PROPOSED

Another proposal in which the judgment and recommendations of the Cornell Project Leader were requested during the initial year dealt with a proposed Animal Research Institute in Davao. It was proposed as a cooperative venture between the Filipinas Foundation, Rockefeller Foundation, and the University of the Philippines. The aim was to re-

vitalize and improve, through sound and coordinated research, the maximum animal production potential of the Philippines, with emphasis on beef cattle. Research was to concentrate on management practices, selection and breeding, pasture and forage crop production, animal nutrition, disease prevention and control, processing and handling of by-products, marketing and others. The Institute also was expected to "provide practical training and education in the principles, concepts and practices involved in the organization, administration and operation of livestock and poultry farms; provide short courses in animal husbandry; and assemble, supplement and disseminate pertinent information and data on its research and other activities."

These objectives were sound and with the potential for increased livestock production, the proposal was supported enthusiastically. The success of the proposed Institute would depend upon adequate financial support and high-quality leadership—a team of people with practical "know-how" of beef cattle and other livestock production, as well as knowledge of soils and crops and other specializations. Hopefully, this proposed Animal Research Institute might be established in Mindanao sometime in the near future as a branch station of the UPCA.

### *Relationships with The International Rice Research Institute*

The International Rice Research Institute (IRRI) was in its second year of operation during the initial year of the UPCA program. Everyone appreciated the advantages of having IRRI on the campus. Its excellent staff in many scientific disciplines and the fine facilities of IRRI already were playing an exceptional and effective role in the graduate education and research functions of the College.

A fact that has not always been fully recognized is the supply of people trained in the agricultural sciences at Los Baños that were available for employment by IRRI when it was established. Most of the positions for technical and operational personnel were filled by Filipinos, as were several of the posts for scientists.

In November, 1963 a conference was held with Dr. Sterling Wortman, Associate Director of IRRI, involving Vice-President Umali and the Cornell Project Leader, to discuss opportunities for participation of IRRI scientists in the College's graduate education program. Dr. Wortman named several staff members at IRRI who would be interested in offering graduate courses, preferably every second year, if requested by the College. These courses would supplement those already being offered by some of the IRRI staff.

Department heads in the College were urged to review their course offerings and to extend invitations to IRRI staff members to teach graduate-level subjects that might be lacking in their course offerings.

Examples of courses that would be exceedingly important were "Chemistry of Submerged Soils" and "Mineral Nutrition of Rice" if taught by the outstanding scientists of IRRI. Such courses would be of great significance to the College's graduate studies program.

It was also suggested that the IRRI seminar on Saturday morning in which research results at IRRI were presented would welcome greater attendance and participation from the UPCA staff. This seminar had much to offer interested College staff and graduate students.

### *Dairy Training and Research Institute*

Another semiautonomous group with good potential for adding to the quality of graduate education and research was the staff of the recently established UN Special Fund Project, Dairy Training and Research Institute (DTRI), on the Los Baños campus. These scientists brought unusual talents in the fields of dairy husbandry, dairy nutrition, dairy technology, forage crops production and utilization, disease prevention and control, and dairy cattle improvement. Graduate courses were to be offered in some of these subjects.

Staff of DTRI indicated a desire to cooperate with Cornell and Asian and American graduate students doing thesis research, providing it related to the on-going projects of the Institute. There was general agreement that this cooperation would provide for profitable and productive relationships between Filipino professors, Cornell visiting professors and graduate assistants and DTRI scientists that would enrich the development program of the College.

### *Developments in Extension Education*

An important development relating to extension activities in the College took place during the early days of the UPCO program. This was the organization of the Coordinating Committee on Extension with Dr. M. C. Bond as chairman. This committee was charged with:

1. Definition of the extension function of the College and its relation to other extension agencies of the government.

2. Description of the departmental and/or office responsibilities such as training, research, communications, action projects, field days, subject matter specialists service, publications and short courses (on- and off-campus).

3. Preparation of developmental plans for each department of the College relative to staff and extension programs as well as instruction and research in extension. This should include present staff composition and programs of activities currently being undertaken and those that should be planned in the future to intensify the College's extension program including farm and home development.

4. Submission of operating procedures to bring about better integration of extension activities and report in all of these areas.

It was felt this committee would play a most significant role in developing among the faculty the philosophy of service to the people of the Philippines. And it was highly important, too, that the role of the College in extension be defined and understood in relation to the Federal extension service and other extension agencies.

### *A Year of Tooling Up*

These are some of the highlights of the first year of the UP-Cornell Graduate Education Program. They illustrate the dynamic leadership of the U.P. College of Agriculture and the desire to move the College into a position of higher quality and stature so as to be of greater service not only to people in the Philippines but also to those in other countries of Southeast Asia. It was a year of rising expectations.

As Dr. Bradfield stated in his annual report at the end of the year:

"In this first year a renaissance has been initiated. It has been a year filled with soul-searching, self-analysis, a frank recognition of many existing weaknesses, a thorough search for ways to strengthen the institution where it is weak. It was a year filled with long hours of hard but enthusiastic work. It was an inspiring and thrilling year to be at Los Baños!"

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## CHAPTER IX

# Review of Program Activities

### *Administration of Program*

#### PROJECT LEADERS

When the operational guidelines were established, it was agreed that "the American contributions in all disciplines shall be coordinated by a single project leader who will serve as a special assistant to the Dean, U.P. College of Agriculture."

In practice, the Cornell project leaders coordinated the activities not only of the Americans but also of the Asian visiting participants as well. They worked closely at all times with the Vice President-Dean, directors, department heads and members of the faculty. Each of the project leaders had full responsibility for operational activities and decisions in the Philippines so far as Cornell was concerned in the mutual cooperative program.

As mentioned briefly earlier, during the initial year while the program was getting tooled up there were three project leaders, each serving a short term (N. C. Brady, K. L. Turk, and Richard Bradfield). They were followed by:

Dr. H. L. Everett, Professor of Plant Breeding  
July 2, 1964-January 8, 1966

Dr. George W. Trimmerger, Professor of Animal Science,  
January 3, 1966-November 28, 1967

Dr. J. F. Metz, Jr., Professor of Marketing and Associate Director  
of Research, September 4, 1967-July 21, 1969

Dr. M. T. Vittum, Professor and Head of Vegetable Crops, Geneva,  
June 30, 1969-July 24, 1971

Dr. E. B. Oyer, Professor and Head, Vegetable Crops, Ithaca,  
July 4, 1971-July 15, 1972

It is recognized that longer terms for the project leaders would have been desirable to provide greater continuity of policies and objectives. This deficiency was partly made up through the continuity of the overall direction and coordination from Ithaca by the Director of the Pro-

gram in International Agriculture. He participated in the early planning, helped establish the goals and objectives, and made seven site visits for observations of progress and for consultations with project leaders, visiting professors and graduate assistants, Philippine faculty and administration, and the representatives of the Ford Foundation.

#### ADMINISTRATIVE REVIEWS

Administrative reviews and visits added materially to mutual understanding and relationships throughout the UPCO program. President James A. Perkins, Cornell University, visited Los Baños in 1965 and gained a full understanding and appreciation of the joint program. During this visit, the second Memorandum of Understanding for the next three years was signed by the two Presidents, James A. Perkins and Carlos P. Romulo.

A visit was made by another high official of Cornell, Dr. Dale R. Corson, Provost (currently President), in 1968. He made a thorough review of all activities of the UPCA and the other institutions of the Los Baños complex.

Dean C. E. Palm reviewed progress of the program on four occasions (1964, 1967, 1968, and 1971) and added greatly to its operations and mutual understanding. Associate Dean W. K. Kennedy made a comprehensive study of research and graduate education of the UPCA in 1966. An administrative appraisal was made in 1968 by Dr. D. W. Barton, Director of the New York State Agricultural Experiment Station (Geneva).

Vice-President Umali spent a month in the United States in June, 1968 for discussions with officials of Cornell and other universities, and the foundations, AID, and the World Bank. Many details for the UPCO program were worked out during his visit to Cornell. Later, Dr. Umali returned for another visit and conferences on program activities.

Dean F. T. Orillo made an official visit of two weeks to Cornell in 1970 to observe the functions of a land-grant university, especially instruction, research, and extension in the College of Agriculture and Life Sciences. While in the United States, Dean Orillo also visited several other land-grant colleges and state universities.

#### FORD FOUNDATION REPRESENTATIVES

Operational aspects of the UPCO program were greatly facilitated by the representatives of the Ford Foundation who worked closely with the College and visiting staff at all times. Dr. Harry L. Case was the first representative to the Philippines, serving from 1964 to 1967. Earlier, the Foundation's interests in the Philippines had been served by its representative in Malaysia. Dr. Case had participated in the planning in New York so had a good background of interest in the project.

Dr. Case was extremely helpful throughout his tenure of service, especially to the Cornell project leaders in the early years of the cooperative program.

Dr. Clark C. Bloom succeeded Dr. Case as the representative in 1967 and continued until 1971. In addition to his excellent and stimulating leadership, Dr. Bloom contributed directly through his teaching work in agricultural economics. He visited Los Baños regularly and kept thoroughly informed on all activities. His keen appraisal of the role of the College in national and international agricultural affairs was most useful.

With the departure of Dr. Bloom, the Manila office of the Ford Foundation was placed under the regional representative in Bangkok. A deputy representative, Dr. Arthur H. Hill, was stationed in Manila for direction of the Foundation's activities in the Philippines until the termination of the UPCO program.

To all of these representatives and assistant representatives, Cornell and other visiting staff are especially grateful for their friendly support and cooperation, suggestions, and wise counsel throughout the UP-Cornell Graduate Education Program. Successful operation of the program would have been most difficult without their assistance and counsel.

### *Program Highlights*

This section reviews some of the highlights of program activities dealing primarily with strengthening of graduate education and research at the U.P. College of Agriculture but also with the overall functions of the College. They are presented here according to resource areas with major treatment of the activities and contributions of visiting professors, consultants, and graduate assistants from Cornell and Southeast Asia working cooperatively with Filipino staff and graduate student participants.

### ANIMAL SCIENCES

Work in animal sciences at Los Baños is concentrated in the Department of Animal Husbandry (later Animal Science), with close interaction and relationships with many other disciplines, especially agricultural economics, agronomy, entomology, and food technology.

A survey of the academic staff in Animal Husbandry in 1963 and again in 1973 showed the following distribution by rank and by level of training (Table 11).

Two conditions clearly indicated the need for upgrading of the staff: the large proportion of the staff at the instructor level; and the fact that in 1963 approximately one-half had training only to the B.S. degree level. To offer high-quality graduate studies would require a larger

TABLE 11. Distribution of Academic Staff in Animal Husbandry by Rank and Level of Training, 1963 and 1973

	1963	1973	1963	1973
Professor .....	1	1 Ph.D.	4	16
Associate Professor .....	2	5(1)* M.S.	15	11
Assistant Professor .....	4	14(3)* B.S. only	15	13
Instructor .....	27(3)*	12(2)*		
Research Assistant .....	-	8		
Total .....	34(3)*	40(6)*	34	40

\*Numbers in parenthesis refer to staff on leave of absence.

proportion of faculty with advanced training and experience in order to qualify for teaching graduate students. Further, they would need greater experience and competence in research with active on-going projects in order to train students in research methods and techniques.

During the 10-year period, considerable progress was made in promotions into the assistant and associate professor ranks, but the staff was still out of balance at both ends—too many instructors and not enough full professors. Substantial growth in staff at the Ph.D. level has been attained, but one-third still hold only the B.S. degree.

#### STRENGTH IN ANIMAL NUTRITION

The greatest strength of the staff in 1963 lay in Animal Nutrition with competence in the applied phases of biochemistry related to nutrition. Greater depth and strength through advanced training was needed in: (a) applied animal breeding and physiology; (b) population genetics; (c) meats and milk technology; (d) dairy microbiology; (e) pasture production and management; (f) dairy engineering, and (g) rumen microbiology.

Graduate education at that time was limited to offering of Master's degrees. Dr. B. V. Travis, consultant, who worked with a committee on recommendations to improve the College program in animal science, suggested in 1964 that the Department of Animal Husbandry should wait about five years before attempting to offer Ph.D. training. This time was needed to train sufficient staff qualified for advanced teaching and research.

Another short-term visiting professor, Dr. J. K. Loosli, then head of Animal Science at Cornell, reported in 1966:

"Before a Ph.D. degree is offered in animal nutrition, the field with greatest strength in the department, better supporting work is needed in biochemistry, physiology, histology, and bacteriology. These same subjects would also support advanced work in animal breeding and physiology of reproduction. Although some of the present staff is qualified to offer Ph.D. level training in animal nutrition, more

adequate space and equipment for laboratory animals are needed for basic research. The facilities for poultry, swine, and dairy cattle are relatively good. Training in statistics seems to be satisfactory as a supporting field. Specific plans to make the needed improvements should be started now and followed systematically until achieved."

#### GRADUATE ASSISTANT PARTICIPATION

Under the graduate assistant phase of the UPCO program, the first exchange in animal sciences started in July, 1964 when W. L. Johnson arrived at Los Baños from Cornell to conduct his Ph.D. thesis research and serve as a teaching and research assistant. Two months later, in September, Mario Labadan from the UPCA arrived at Cornell to pursue his course of study to meet the course requirements for the Ph.D. in animal nutrition.

Prior to his departure for the Philippines, Mr. Johnson and his major professor established the area for thesis research through correspondence with counterparts at Los Baños. By mutual agreement the project was undertaken in cooperation with the nutrition divisions of DTRI and the Department of Animal Husbandry, UPCA. The topic chosen was "Nutritive value of guinea grass (*Panicum maximum*) for cattle and water buffalo in the tropics." This subject fitted into DTRI's long-range research objectives in tropical pasture evaluation and the results would have significance to the Philippines and other tropical regions of the world. This project provided good opportunities for close working relationships, which were mutually rewarding to the UPCA, DTRI, and Cornell. The graduate student learned new techniques from several co-workers who in turn learned research methods and techniques from him.

Mr. Johnson spent two years at Los Baños conducting forage evaluation studies. Values were established for dry matter yields, proximate composition, digestibility, and voluntary intake of guinea grass of different growth stages and for the wet, early-dry, and late-dry seasons at Los Baños. Philippine water buffaloes were found to have greater ability than cattle to utilize nutrients from guinea forage. Factors affecting forage intake were studied and some improvements in forage evaluation procedures were developed.

From the results, seven papers were published in appropriate scientific journals, both in the United States and the Philippines, with joint authorship in all cases.

Mr. Johnson found that the opportunity for teaching was a highlight of his experience. He taught courses in dairy production and introductory animal husbandry. New laboratory exercises were introduced as were some innovative teaching techniques. Mr. Johnson took advantage of the opportunity to audit graduate-level courses in agricultural

economics at the UPCA. He was the first UPCO graduate assistant to complete the Ph.D. Since all members of his Special Committee (G. W. Trimberger, J. K. Loosli, and R. B. Musgrave) were in Los Baños as visiting professors and consultants at the time his thesis was completed, Mr. Johnson arranged for the final examination to be given at Los Baños.

Mario Labadan spent two and one-half years of graduate study in poultry nutrition at Cornell and returned to Los Baños in February, 1967 to conduct his thesis research. His research was planned several months before he left Ithaca and some pilot experiments had been conducted. This allowed for the ordering of equipment, special facilities and necessary supplies in time for them to be largely available upon his arrival at the College. Thus, Mr. Labadan's research was started immediately upon his return, and his department head was careful to see that he was given the time necessary for high-quality research.

Since there was not a faculty member at the UPCA with the qualifications to supervise the poultry nutrition projects planned by Mr. Labadan, arrangements were made for his major professor at Cornell, Dr. M. L. Scott, a distinguished poultry nutritionist, to spend three months at Los Baños beginning in late February, 1967. In addition to assisting with the initiation of a research program for Mr. Labadan's thesis, as well as for the benefit of the Philippine poultry industry, Dr. Scott gave a series of lectures and seminars at Los Baños and at other universities. These were not only informative in terms of up-to-date subject matter in nutrition for the benefit of students, faculty, and representatives of the poultry and feed industries, but also served as examples for future graduate student teaching.

Mr. Labadan made intensive studies of energy-protein relationships in the nutrition of poultry, the energy content of Philippine feeds, and the effects of nutrient imbalances upon energy utilization by broilers and layers under Philippine conditions. Mr. G. O. Ranit, another staff member, studied the phosphorus and calcium requirements of hens for maximum eggshell quality and effects of various Philippine feed-stuffs on exterior and interior egg quality for his Ph.D. thesis for a UPCA degree.

When Mr. Labadan's research was completed, Dr. M. L. Scott returned in September, 1968 for another three to four months to (a) review carefully the research accomplished by Mr. Labadan, (b) make suggestions on details needing further investigation, (c) review and criticize the thesis thoroughly and make suggestions for its publication, and (d) preside at Mr. Labadan's final oral examination. Other important objectives for Dr. Scott were to: (a) give lectures and seminars at the graduate level; (b) assess the adequacy of the undergraduate and

graduate teaching programs; (c) review the depth and quality of the research projects in animal nutrition; (d) assist in planning a wide variety of research projects directed at important Philippine poultry industry problems; (e) participate in the preparation of a textbook; and (f) study poultry management problems in the Philippines. Even though both of his assignments were of short duration, Dr. Scott was one of the most effective of all visiting professors.

Some high points of Mr. Labadan's thesis research findings, written in 1968, will demonstrate the value of this type of program:

1. He determined the metabolizable energy values of many Philippine feedstuffs, demonstrating a wide variation in quality and showed some of the reasons for this variability. He is presently working toward ways and means of improving processing techniques to reduce the variability in quality of the feedstuffs.

2. He found that the metabolizable energy value of fresh rice bran is protected from oxidative rancidity by being sprayed with an alcoholic solution of the antioxidant, ethoxyquin, but that it loses up to 75 per cent of its energy value within one month if its rancidity is allowed to go unchecked. This means that thousands of tons of good food value could be saved each year by means of a simple spraying procedure at each rice mill which would cost only a few centavos per ton of treated rice bran.

This study has opened up many avenues of further research. The question must be answered why the oxidative rancidity of the 13 per cent rice oil present in the bran causes a loss of as much as 75 per cent of the feeding value. Do the products of rancidity react with the proteins of the bran? If so, does this also reduce the protein biological value? These are basic research problems the answers to which will not only help the Philippines but may add much to our basic scientific knowledge.

3. Other experiments dealt with the types of molds that infest copra and the toxicity of these molds for chickens and ducks. It also dealt with procedures such as spraying with alcoholic solutions of sodium propionate which inhibit the growth of the molds. Studies also were conducted with supplements needed to balance the nutrients in copra so that it might be used at levels of 40 to 50 per cent in poultry diets.

Mr. Labadan took his final examination in October, 1968 and became the first Filipino to complete the Ph.D. under the UPCO program. As he looked back over his experience when interviewed in 1972, Mr. Labadan made this observation:

"When I started doing my thesis after returning to Los Baños from Cornell, I had the feeling this was a disadvantage in the program. But gradually, as I continued my research work, I realized there was also a great advantage in the program, particularly the momentum that is attained from this type of research. The incentive is first getting the degree and secondly, starting out on something that is applicable in the Philippines.

"Now, as a matter of fact, looking back not only from the standpoint of getting the degree, but also for getting some real rewards from outside, the thesis problem I had in the program really started me in getting involved not only in the University research areas but also in the industry. From the project that we started, a lot of things have really happened. It gave us more ideas on what the industry really needs. From my thesis work we developed three major research proposals which were simultaneously submitted to the National Science Development Board and the National Research Council. Even before I got my degree from Cornell I had these researches submitted and approved. Therefore, I feel that from the aspect of getting momentum in my research work, the program has really attained its goals or objectives."

These proposals provided in excess of 300,000 pesos annually for Mr. Labadan's research. In another discussion, he remarked that by doing his thesis research at Los Baños he was able to lay out his research program for the next 10 years directed at problems of Philippine poultry producers.

In recognition of his work, Dr. Labadan received the 1971 Don Andres Soriano Animal Science Research Award of the Philippine Society of Animal Science. He was also chosen one of the Ten Outstanding Young Men (TOYM) of the Philippines in 1971 for his research on poultry nutrition.

The second Filipino graduate assistant from the animal sciences, V. C. Momongan, was sent to Cornell under the program in 1965. His major was in the field of animal physiology, one of the areas that needed strengthening at Los Baños. After completion of his course work and oral examination and a preliminary experiment at Cornell, Mr. Momongan returned to Los Baños in February, 1968 to initiate his thesis research on the effect of milking stimulus and stage of lactation on the levels of oxytocin in the blood during the milking process.

Professor G. H. Schmidt, Mr. Momongan's major professor at Cornell, went to Los Baños for three months in September, 1968 to assist him in the conduct of his research and also to study mastitis and other management problems in the College dairy herd. Professor Schmidt reviewed and appraised the department's teaching and research in animal physiology and taught the course in livestock endocrinology for several weeks.

Working under the guidance of a committee of Cornell and Filipino professors, Mr. Momongan completed his thesis and final examination at Los Baños in July, 1969. Although his research findings did not have the breadth of application desirable for Philippine conditions, Mr. Momongan received excellent training in basic and applied physiology and should be able to make valuable contributions in teaching and research.

A third Filipino staff member in animal science was sent to the United States for advanced training under the UPCO program. He was Reynaldo Resurreccion, DVM graduate from the University of the Philippines, who went to the University of Georgia for M.S. level training in Avian Medicine. He successfully completed the M.S. degree, then took a leave of absence from the UPCA in order to continue on for Ph.D. level work in veterinary medical virology under an assistantship from the University of Georgia. At the termination of the UPCO program, Mr. Resurreccion was still working on his degree which is expected in December, 1974 at which time he will return to the faculty of animal science at Los Baños.

The last staff member from Cornell at Los Baños under the UPCO program was a graduate assistant, Mr. Robert J. Grant. His thesis research followed the earlier work of W. L. Johnson and dealt with (a) suitable means of evaluating tropical forages in the laboratory; and (b) comparison of digestibility of tropical forages among types of ruminants in the Philippines. Napier grass (*Pennisetum purpureum*) was used as the experimental forage. A further objective was to establish a laboratory at the UPCA using suitable *in vitro* rumen digestion techniques, including analytical procedures such as neutral-detergent fiber (cell-wall), acid-detergent fiber, lignin, and silica analyses. This work, involving metabolism experiments and *in vitro* digestion analyses, was cooperative with staff members in the nutrition laboratories of Animal Husbandry and DTRI. There was active interchange of ideas and information and a fairly large number of Filipinos were trained to use the *in vitro* techniques. Further, the equipment was left in place and will contribute to continuing research on evaluation of tropical forages. The results of the experiments added materially to knowledge on the nutritive value of Napier grass with a wide application in tropical countries.

As with all Cornell graduate assistants, Mr. Grant assisted with the teaching in one or two courses, presented seminars, and audited courses given by Filipino faculty.

#### ADDITIONAL STAFF DEVELOPMENT

Several junior staff members in Animal Husbandry were abroad doing graduate study when the UPCO program was initiated. Additional staff went on other sources of support, such as assistantships from U.S. universities, fellowships from the Rockefeller Foundation, and the Colombo plan. As these staff members returned from their advanced training abroad, this provided for a gradual increase in the number of faculty with Ph.D. level of education. The larger number with Ph.D. level training provided for strengthening the staff in Animal Breeding and Physiology, Meats Technology, Livestock Production, and further upgrading in Animal Nutrition.

As the quality and stature of the faculty in Animal Sciences grew and developed, the problem of brain-drain also increased. Some of the staff left for job opportunities in other countries and with other agencies in the Philippines.

#### FILIPINO VISITING PROFESSOR AT CORNELL

In the early phase of the program it was considered desirable to invite a visiting professor to Cornell each year from the U.P. College of Agriculture. Dr. L. S. Castillo, Associate Professor of Animal Nutrition, was chosen for one of these assignments and spent the year 1966-1967 in the Department of Animal Science at Cornell. He gave a series of seminars, lectures in several courses, audited nine different graduate-level courses for his professional growth, and reviewed research techniques and methods in animal nutrition. Among Professor Castillo's major efforts at Cornell was the preparation of the first six chapters of a book, tentatively titled, "From Primitive to Modern Agriculture with Water Buffaloes." There was ample opportunity for interaction with faculty in animal science and about 70 graduate students, with 40 per cent of the latter coming from other countries.

Dr. Castillo participated in a number of conferences and was invited to give a paper at the annual meeting of the American Dairy Science Association on "U.S. Graduate Training as Viewed by a National from a Developing Country."

#### CORNELL VISITING PROFESSOR AT THE UPCA

Professor J. C. Miller, who had recently retired as head of the Department of Animal Science at Oregon State University and earlier had been Dean of Agriculture at Texas A & M University, spent two years at Los Baños as a visiting professor in Animal Husbandry. He was assigned to the animal breeding and physiology division of the Department and taught graduate courses, but he also worked with all members of the staff, counseling with them on teaching and research.

At the request of Vice-President Umali, Professor Miller gave major attention to an evaluation of the potentials and problems of the beef industry in the Philippines. Two important projects were initiated. The first was a forage-cattle husbandry management research project cooperative between the UPCA and the Yulo and Sons Corporation at their ranch in Pampanga. It was started in July, 1968, but was transferred later to the Virginia ranch in Mindanao.

In cooperation with representatives of the UPCA and Central Mindanao University (CMU), Professor Miller assisted in the formation of a second project, a cooperative forage-cattle training center at Central Mindanao University. Major emphasis was on ranch management training and demonstration. The UPCA provided technical and con-

sulting services and CMU the land, cattle, personnel, and other physical facilities. This program was activated in 1969 and partly financed by the Ford Foundation. Progress reports on either of these projects are not available to the writer.

After spending two years in the department and recognizing fully the progress and developments that gradually had been taking place, Professor Miller made a number of observations and recommendations in his terminal report. Some of those of particular significance were:

1. A thorough, in-depth, self-evaluation of the department by the staff is recommended. Such evaluation should define short- and long-range objectives, identify strengths and weaknesses, and establish priorities of teaching, research, and extension.

2. There is a wealth of capable and well-trained staff members in the department (15 Ph.D.'s, 9 with M.S., 3 DVM, and 29 B.S. degree holders). In the opinion of the visiting professor the number of academic staff could be reduced. Some merit promotions to associate and full professor should be made with appropriate salary adjustments. Emphasis should be on quality rather than quantity.

3. There is a need for more coordination and cooperation among the different divisions of the department. More team effort in research is essential for maximum use of resources. Both inter- and intra-departmental team effort needs to be encouraged.

4. The quality of livestock (swine, cattle, and horses) and the husbandry they receive need to be improved. Closer supervision of the feeding, management, and record-keeping of some of the livestock by the officers in charge is necessary for maximum use in teaching, research, and extension.

5. A satisfactory job of teaching is generally being done at both the undergraduate and graduate levels. Staff should be encouraged to write textbooks and laboratory manuals for Philippine conditions.

6. Would consolidation of DTRI and Animal Husbandry into one unit make more effective use of limited funds which are now divided between the two units?

7. What are good public relations worth? How much support and cooperation does the department get from the poultry-livestock and related industries? Is there need to make a greater effort to improve public relations?

8. Should there be more emphasis on applied and management-type research? Are the high-priority problems of the livestock industry in the Philippines comparable to those in countries having a well-developed livestock industry? Is our research primarily oriented toward solving problems of importance to the Philippines livestock industry or is it influenced by what is being done abroad?

9. Marketing is one of the major problems confronting the development of the livestock industry in the Philippines. Does the College have the staff competence to give direction and emphasis needed in livestock marketing and ranch management?

## GRADUATE STUDIES STRENGTHENED

The quality of graduate instruction and research in Animal Science increased markedly during the past ten years. Instruction at the Ph.D. level was inaugurated in several disciplines, and the number of graduate students increased.

Laboratories and equipment in DTRI provided additional facilities for graduate research. Animal Husbandry did not get any major improvements under the development program, but improvements in laboratory equipment and in quality of research were especially noteworthy. Visitors to the Department of Animal Science at the termination of the UPCO program were impressed by the substantial growth and development which had occurred during the ten-year period. The department had capable leadership and the quality and productiveness of the staff placed it close to the top among all departments at the UPCA. There was still need for greater teamwork among the staff members. If reasonable financial support is provided and if the key members of the staff can be retained, one can be optimistic of the future role of the staff in Animal Sciences in graduate education and research at Los Baños and in the Department's impact on livestock production in the Philippines.

## PLANT SCIENCES

Plant sciences at Los Baños embrace programs in Agronomy, Agricultural Botany, and Plant Pathology. Activities in Plant Pathology will be reviewed under the section "Crop and Animal Protection"; therefore, this section will concentrate on developments in instruction, research, and extension in the other two departments, Agronomy and Agricultural Botany.

Distribution of academic staff by rank and by level of training for each of these two departments is shown in Tables 12 and 13.

TABLE 12. Distribution of Academic Staff in Agronomy and Agricultural Botany by Rank, 1963 and 1973

	Agronomy		Agricultural Botany	
	1963	1973	1963	1973
Professor .....	2	4(1)*	1	-
Associate Professor .....	1	3	-	3(1)*
Assistant Professor .....	4	25(4)*	4	7
Instructor .....	40(11)*	16(4)*	16(3)*	19(7)*
Assistant Instructor .....	2	1	3	-
Research Assistant .....	13(2)*	3	11(3)*	2
Total .....	62(13)*	52(9)*	35(6)*	31(8)*

\*Numbers in parentheses refer to staff on leave of absence.

TABLE 13. Distribution of Academic Staff in Agronomy and Agricultural Botany by Level of Training, 1963 and 1973

	Agronomy		Agricultural Botany	
	1963	1973	1963	1973
Ph.D. ....	6	28	4	9
M.S. M.A. ....	14	13	12	13
B.S. A.B. only ....	42	11	19	9
Total.....	62	52	35	31

Those at the full professor grade in 1963 were either in administration or retired. There were only a few at the associate and assistant professor grades, with a vast majority in the grades of instructor and below. And in terms of advanced training, more than 60 per cent of the academic staff held only the B.S. degree. It was obvious that a majority of the staff (with the exception of Plant Breeding) had neither the training nor experience to offer graduate studies and advanced degrees in the Plant Sciences. There was much to be done, therefore, in upgrading the training and research experience of the faculty in the plant sciences.

Note the remarkable increase in the staff at the professorial grades, and those with M.S. and Ph.D.'s, especially in Agronomy, in 1973. Relatively high-quality graduate studies were now being offered in nearly all plant science disciplines.

Program activities are described here in the following areas: (a) Field crops physiology; (b) Field crops breeding and production; (c) Forage crops and grain legumes; (d) Vegetable breeding and production; (e) Pomology—fruit crops.

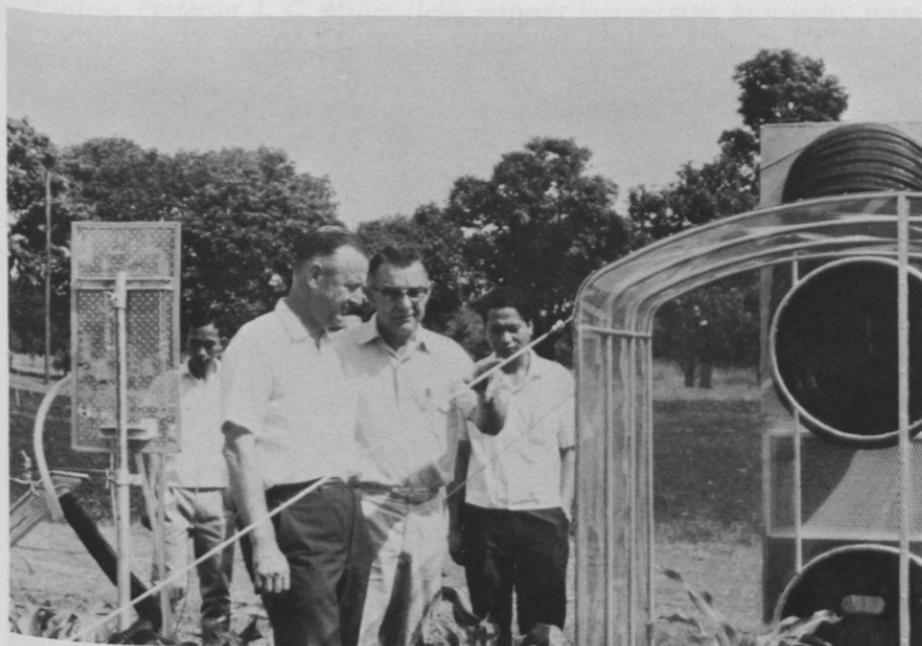
#### FIELD CROPS PHYSIOLOGY

In the early discussions of the staffing pattern for the UPCO program, priority was given to a visiting professor in Agronomy to assist with teaching and research in field crop science. Consideration was immediately given to R. B. Musgrave, professor of field crops at Cornell, who had served on the first Cornell-Los Baños project for 18 months in 1957-1958. Arrangements were made, therefore, for Professor Musgrave to go to Los Baños in July, 1964.

Prior to his departure for the Philippines Professor Musgrave obtained permission to take a National Science Foundation (NSF) project on photosynthesis in corn and other plants with him to the Philippines. To do this required transportation of a large amount of scientific equipment and supplies and arrangements for two of his experienced graduate assistants, Gary Heichel and Fred Palmer, to accompany him to the Philippines for a period of two years. Segments of the project were



*H. M. Munger (left), Visiting Professor of Plant Breeding, discussing research on bushsitao (green beans) with J. M. Soriano, Filipino graduate student, and H. C. Wien, UPCO graduate assistant from Cornell.*



*R. B. Musgrave (center), Visiting Professor in Crop Science, and Filipino colleagues show photosynthesis research equipment to President James A. Perkins of Cornell when he visited Los Baños in 1965. Three young Filipino staff members and two Cornell graduate assistants completed their Ph.D. thesis research using this equipment under the direction of Professor Musgrave.*



*Expanded production of high-protein grain legumes is highly desirable in developing countries. Ed Quisumbing (right), demonstrates some of his field experiments with cowpeas to Visiting Professor and Cornell Project Leader, E. B. Oyer.*



*Emil Javier shows his forage crops experiments to Cornell Provost D. R. Corson and visiting professors. Javier was one of many Filipino participants who returned to Los Baños for their Ph.D. thesis research under the UPCO program.*



*Visiting Professor J. C. Miller (left) inspects forage-cattle husbandry management research project. It was a cooperative venture between UPCA and Yulo and Sons Corporation at their ranch in Pampanga.*



*Visiting Professor L. V. Crowder inspects a tropical forage demonstration plot. The Dairy Training and Research Institute is in the background.*



*Improved utilization of pastures and other forage crops is essential for improved livestock production in the tropics. R. J. Grant, UPCO graduate assistant from Cornell, conducts significant research on tropical forages using in vitro digestion analyses.*



*Ulysses Lustria, an M.S. candidate under the UPCO program, assists Professor E. M. Rigor perform an operation to give students an understanding of reproduction in swine.*

to be used for their thesis research. They would provide Professor Musgrave with valuable assistance in getting research accomplished and would also be of great value in training young Filipinos how to use the equipment and other research techniques.

Besides contributing the major share of the assistantship salaries of the two accompanying graduate students, the NSF grant also provided substantial funds for Master's thesis investigations of two UPCA graduate students under the UPCO program and also for some of the thesis studies of one undergraduate student.

Professor Musgrave and his two graduate assistants were assigned to the Farm Crops Division of the Department of Agronomy. Unfortunately, there were no staff members in this Division at the time with training to the Ph.D. level and graduate courses in Field Crops were not being offered. Because of the location of the experimental work and the need for storage and shop facilities, the Cornell staff worked more in the research Farm Operations Division of the College than in Agronomy. Excellent cooperation was obtained from Mr. R. K. Palis, head of the Farm Operations Division, and his staff.

In his report on the status of the Agronomy Department upon his arrival, Professor Musgrave wrote:

"The present status of the department can be characterized as being in the early stage of an upgrading program. This program was started with inadequate manpower in all but the plant breeding division. Several qualified individuals have been sent abroad for Ph.D. training, and a few more individuals have left for other employment. Those remaining, except in Plant Breeding, have difficulty in finding time for anything except the teaching to which the department is committed. Very limited research is in progress and worthwhile participation in the graduate training opportunities at the College, especially in the Farm Crops division, is largely lacking. . . .

"A shortage of Agronomy majors who are qualified to enter into a Ph.D. training program still persists. A few qualified individuals have shifted from other areas but Agronomy still faces several years of rebuilding before it can be expected to generate its own replacements."

The major objective of Professor Musgrave's research was to identify strains of corn which exhibit either extremely high or extremely low potentials for photosynthesis. More than 50 strains were readily available from the UPCA for testing. These consisted mainly of inbreds and single crosses used in recommended Philippine hybrids and of varieties and hybrids being tested in the Inter-Asian Cooperative trials. The NSF program stimulated and supported research in several areas, most of them with corn, but also with some other Philippine crops.

One major study with corn was designed by Gary Heichel to determine the influence that leaf-moisture stress has on the variance in

photosynthetic capacities exhibited by different genotypes of corn. Another study was designed by Fred Palmer to determine the fate of photosynthates produced by various leaves of corn at the early reproductive stage.

Mr. Palmer used radioactive tracer techniques to obtain the necessary data for his thesis. Since the College of Agriculture did not have the necessary equipment, Mr. Palmer made arrangements to use the equipment at the IRRI. Not only did this provide very good linkage between the UPCO program and IRRI, but an unexpected advantage to the Cornell graduate assistants in terms of contacts made with prominent scientists from all over the world. The College and associated institutes at Los Baños rapidly were becoming an important stop on many a traveler's itinerary.

After installing the gas analysis and auxiliary equipment, which was brought from Cornell, in a trailer at Los Baños and while waiting for corn to gain sufficient size for photosynthesis studies, Professor Musgrave decided to analyze photosynthesis and transpiration in pineapple. One of the Filipino graduate students working on his M.S. degree at Los Baños, Mr. Elpidio L. Rosario, used equipment similar to that for pineapple to determine the influence of light intensity and CO<sub>2</sub> concentration on the net photosynthetic and true photosynthetic rates of several varieties of sugarcane. Another UPCA graduate student using a newly-designed leaf chamber and heat exchanger, investigated the influence of light intensity and carbon dioxide concentration on photosynthesis rates in castor bean leaves.

An undergraduate student determined the influence of the quantity of light absorbed by two varieties of paddy rice on their photosynthetic capacities. The varieties were grown at two rates of nitrogen fertilization and careful determinations of their respiration rates were made in order to determine why differences in net photosynthesis exist.

These photosynthesis studies afforded an effective program in training graduate and undergraduate Filipino students in research methods and techniques, as well as giving them an opportunity to work with experienced graduate students from Cornell. The only missing link in the team working at the graduate level in field crops physiology was the lack of senior Filipino staff.

#### *Filipino Ph.D. Candidates Go to Cornell*

To upgrade the quality of the faculty in farm crops and botany, three young staff members were selected for the UPCO program to take course work at Cornell and return to Los Baños for thesis research. The first of these, Mr. Adolfo C. Necesito, went to Cornell in 1965; the second, Mr. Elpidio L. Rosario, went in 1967. Both had completed their M.S. degrees at the UPCA and went to Cornell for major studies in Field Crops Science under the direction of Professor Musgrave. The

third member of the group, Mr. Percy C. Sajise, was from Agricultural Botany. He went to Cornell as candidate for the M.S., but after completing his degree continued course work leading to the Ph.D. in Agronomy and Applied Ecology, with Professor Musgrave as his major advisor.

After satisfactorily completing all the requirements for the Ph.D. except the thesis, Mr. Necesito returned to the UPCA in January, 1969 and initiated research on the soil-plant-water relationships of Virginia tobacco in the Philippines. Most of the carefully controlled studies were made at the College, but extensive field studies were made in the San Fernando tobacco-growing area. The valuable experiences Mr. Necesito had in the field working with farmers and their problems and from the independent research at the UPCA with more sophisticated experiments stand as evidence of the contributions of the UPCO model for Ph.D. programs to the development of teachers and researchers for developing countries.

Mr. Rosario and Mr. Sajise returned to the UPCA in August, 1970 to initiate their thesis research. Mr. Rosario studied the physiological aspects of photosynthesis differences in relation to yield exhibited by some sugar cane varieties. Mr. Sajise made an evaluation of cogon grass as a seral stage in Philippine vegetational succession.

At the request of the UPCA administration and the staff members working on their dissertations, arrangements were made for Professor Musgrave to return to Los Baños in late December, 1970, for a period of four months. This enabled him to work effectively with Mr. Necesito in the completion of his research and final examination and also to assist in the early phases of the research of Mr. Rosario and Mr. Sajise. Both then carried their programs through under the general direction of Special Committees of Cornell and UPCA professors at Los Baños, completing their degrees in 1972.

### *Photosynthesis Equipment*

When Professor Musgrave completed his assignment in 1966, the UPCA decided it would purchase the photosynthesis equipment which had been brought to Los Baños on the NSF project. Most of the staff familiar with this expensive equipment and its use soon were in the United States for advanced studies. The equipment deteriorated somewhat and was used relatively little in research for a period of three years. With the return of Mr. Necesito, and later, Mr. Rosario and Mr. Sajise, repair parts and supplies were obtained and steps were taken to put the equipment in shape again. At this time (1971), Professor Musgrave was back on campus and it was necessary for him to spend about one-half of his time reconditioning various systems of the photosynthesis field laboratory. This was necessary since both Mr. Rosario and Mr. Sajise needed to make extensive use of the equipment in their

thesis research and in subsequent studies. They worked constantly with this rehabilitation under the close supervision of Professor Musgrave in reassembling and testing the special leaf chambers and temperature controlling devices which they had individually designed and fabricated at Cornell during the summer of 1970.

At the termination of the UPCO program, a faculty committee was functioning effectively in: (1) programming the use of the various facilities of the laboratory for the researchers concerned; (2) maintenance and improvement of the laboratory; and (3) finding ways and means of maximizing the usefulness of the laboratory to the research and education programs of the UPCA.

### FIELD CROPS BREEDING AND PRODUCTION

The Plant Breeding Division of Agronomy was perhaps the strongest group in the College of Agriculture at the time the UPCO program was initiated. There was a solid core of well-trained faculty, and several outstanding young staff were abroad for Ph.D. training. Because of this strength there was only limited need for visiting professors and consultants. Assistance was specifically requested in Corn Breeding.

#### *Corn Breeding*

Cornell sent its corn breeder, Dr. H. L. Everett, to Los Baños as Project Leader in July 1964 for a period of 18 months. Although his duties as project leader left relatively little time for teaching and research, he was available for consultation and effective relationships were developed through the teaching and research of Cornell graduate assistant, Charles A. Francis.

Mr. Francis conducted two years of research on downy mildew, an extremely serious fungus disease in maize. The problems of this disease are severe in the rainy season, but only limited work had been done on the life cycle, epidemiology, host range and geographical distribution, and artificial induction of the disease. Some inbred line selections were relatively more resistant to the disease than the initial varieties. Inheritance of resistance to the disease appeared to be quantitative, however, underlining the difficulty met to date by breeders in developing resistant varieties.

As mentioned briefly earlier, Dr. E. W. Sprague of the Rockefeller Foundation spent several weeks at the UPCA in May-June, 1964 and arranged for the College's participation in the Inter-Asian Corn Improvement Program. The College hosted the Second Annual Inter-Asian Corn Improvement Workshop in December, 1965. Professor Musgrave and his graduate assistants presented a paper on their ongoing research. Professor Everett discussed the UPCO program at the concluding banquet of the conference.

The UPCA requested Cornell to provide a longer-term visiting professor in Plant Breeding, especially for work in Corn Breeding, including seed multiplication, distribution, and extension. Since it had only one corn breeder on its staff, Cornell recruited Dr. James C. Sentz of the University of Minnesota for this assignment during July 1966 to May 1968. In preparation, Professor Sentz spent several days at the International Maize and Wheat Improvement Center (CIMMYT) in Mexico reviewing their development of improved corn varieties.

It is appropriate to remember that a succession of corn breeders had been provided during the Cornell-Los Baños Program, 1952-1960, and superior yielding hybrid varieties responsive to fertilization were developed. These hybrids failed to make an impact upon the agricultural economy, however, primarily due to inadequate production and distribution of quality seeds.

Two open pollinated varieties, UPCA Var 1 (yellow) and UPCA Var 2 (white) introduced and isolated at the College in cooperation with the Inter-Asian Corn Improvement Program were accepted by the government approving agency in 1966. Continuation of this program during Professor Sentz's tenure resulted in adoption of two additional varieties, UPCA Var 3 (yellow) and UPCA Var 4 (white), making available four varieties which were as much as 15 per cent superior to the better Philippine hybrids. More than 400 additional varieties and germ plasm combinations were evaluated during these two years. The outstanding selections of these for yield and grain type were recombined into major gene pools (white and yellow) for further improvement.

With assistance from Professor Sentz, the National Intensified Corn Production Program was initiated in 1966. Dr. V. R. Carangal of the UPCA was selected to direct this new program and has given it excellent leadership. The program was especially significant in the adaptation and commercial production of the improved varieties. This was most important, since seed production and distribution problems were primarily responsible for failure of initial Philippine hybrids. Later an advanced training and research program for corn, sorghum, and other upland crops was initiated, with partial support from the Rockefeller Foundation. This was designed to provide well-trained personnel and good information for continuation of the variety improvement and production program in corn, with extension to other upland crops. Additional activities in crop production are presented below in sections, "Evolution of Extension at Los Baños" and "Progress in Attainment of Goals."

Two M.S. theses and a further project study were conducted under the direction of Professor Sentz on combining ability of introduced and native varieties. Programs were initiated to evaluate the selection potential of these varieties and varietal combinations and further improve grain yield and quality.

Under Professor Sentz's advisorship also, an extensive research problem was developed for the Ph.D. thesis of Rusli M. Hakim of Indonesia. This study, an evaluation of mass selection and family selection for corn improvement in a tropical environment, was carried out jointly at the UPCA and at the Mindanao Institute of Technology, Kabacan, North Cotabato. Later, Mr. Hakim's dissertation was completed under the supervision of Dr. V. R. Carangal and Dr. A. A. Gomez of the UPCA, assisted by Dr. L. V. Crowder, visiting professor from Cornell in Plant Breeding.

Mr. Hakim had been a Rockefeller Scholar at Los Baños, obtaining the B.S. degree in 1959. Later he was a Rockefeller Scholar at Cornell where he obtained the M.S. degree in 1965 under the direction of Professor H. L. Everett. Professor Everett as Project Leader assisted in working out arrangements for Mr. Hakim to return to Los Baños as a U.P.-Cornell Graduate Research Fellow, 1965-1969, for his Ph.D. program. At this time Mr. Hakim was associate plant breeder, Central Research Institute of Agriculture, Bogor, Indonesia.

Toward the end of Professor Sentz's assignment a request was made for the consultant services of Professor R. L. Plaisted, Head of the Department of Plant Breeding at Cornell, to review the teaching, research, and extension in Plant Breeding at Los Baños. He made this review during six weeks beginning in January 1968. It was apparent to Professor Plaisted that the present staff in Plant Breeding at the UPCA was capable of independently executing their responsibilities in research and graduate training. He felt this observation would be valid only as long as the present staff was maintained and encouraged. At the same time, Professor Plaisted pointed up serious staff deficiencies for graduate training and research in closely related fields, especially in Crops Production.

#### FORAGE CROPS AND GRAIN LEGUMES

The need for effective leadership at the UPCA in forage crop improvement had been evident for many years. It was encouraging, therefore, when Mr. Emil Q. Javier elected to participate in the UPCO program as a Ph.D. candidate for major work in Forage Breeding, following completion of his M.S. degree at the University of Illinois. He entered Cornell in July 1964 and, after an excellent record of scholarship, returned to Los Baños for his thesis research in September 1966.

Another Ph.D. candidate, Mr. Noel G. Mamicpic, also was sent to Cornell in 1964 for major work in Field Crops, with special interests in seed technology. He returned to the Philippines for his research on Mung beans in October 1966.

Since there was no visiting professor from Cornell at Los Baños with special interests in pastures, forage crops, and grain legumes and also

no qualified Filipino staff, arrangements were made for Professor L. V. Crowder to spend a few months at the UPCA to assist with the initiation of the research programs of Mr. Mamicpic and Mr. Javier. In addition, Professor Crowder helped firm up longer range and broader programs which could be conducted along with the thesis research. Progress was made in collaborative work with forage crops between the staff of Agronomy and DTRI. For example, plans were developed for early evaluation of species, varieties, strains, and selections in Agronomy and then moving the more promising ones to DTRI for animal evaluation. Seminars were presented and a revision was made of syllabi for two Forage Crops courses. An important contribution was made in the development of improved guidelines for returning Filipino graduate students.

Mr. Mamicpic's thesis was concerned with the characterization and evaluation of variability in Mung beans. Seeds were collected from many locations in the Philippines and other countries for use in his studies. Wide variations in plant type, seed yield, sprouting values, and protein content were found, indicating the need for varietal improvement. Visiting professors D. H. Wallace and J. C. Sentz were helpful in various aspects of the research, and still another visiting professor, H. M. Munger, contributed to the final preparation of the thesis.

In his research, Mr. Javier studied the phenology, flowering behavior, mode of reproduction, and seed potential of Guinea grass, Napier grass and para grass. He found wide variation, indicating improvement potentials through selection of superior types. These investigations laid the foundation for future expansion of a pasture and forage improvement program at the UPCA. In the cytology phase of his research, Mr. Javier used the facilities of the cytogenetics laboratory of IRRI and obtained excellent collaboration and assistance from their scientists.

Professor Crowder returned to Los Baños for another three-months' period, December 1968-March 1969, to assist in the completion of the Ph.D. programs of Mr. Mamicpic and Mr. Javier and with the planning of their future programs. In addition, Dr. Crowder developed arrangements for some Ph.D. students at Cornell to do their thesis research at IRRI, gave encouragement and assistance to an Indonesian graduate student, Mr. Hakim, in the completion of his Ph.D. thesis, prepared a draft manuscript jointly with Mr. Javier for a bulletin, "Grasses and Legumes for the Philippines," and developed preliminary plans for a book, "Tropical Pastures and Forage Crops."

### *Thesis Research at Los Baños Pays Good Dividends*

These graduate students in forage crops and grain legumes and especially Mr. Javier's thesis research afford evidence for the con-

tributions of the UPCO model. In an interview in 1972 to review his impressions of the program, Dr. Javier said:

“When I was doing my thesis research on pasture grasses, I also worked on legumes, seed production of legumes, and introduction of plants which were not a part of my thesis. Before I got finished with my thesis I had publications out on these additional interests. Since I was the one working on tropical pasture legumes, I was put in charge of the National Food and Agriculture Council (NFAC) Pasture Seed Production Program. They provided substantial amounts of money for this. And before my thesis research was finished, I submitted a proposal to NSDB for funding for continuing the pasture research, and it was funded. Another project to NFAC was funded. Through the UPCO support of about 30,000 pesos, I was able to parlay this into a total of 562,000 pesos of grant funds in the first year after my graduate research.”

In 1972 Dr. Javier was head of the College's Pasture and Forage Section of the Agronomy Department and had developed excellent teamwork involving staff members in several departments, especially Agronomy, Animal Husbandry, and DTRI, Agricultural Botany, Agricultural Economics, and Soils, as well as those in other government agencies. He was serving as coordinator of the National Cooperative Pasture Resources Development Program sponsored by the NFAC, National Science Development Board (NSDB), and the Ford Foundation. This program involves applied research, seed production, graduate training, and training of extension workers with cooperative efforts of the UPCA, BAI, BPI, Bureaus of Soils and Forestry, CMU and the Agricultural Productivity Commission (APC). Examples of activities inaugurated in its first year, 1971-1972, included (a) establishment of five regional pasture research stations and three substations; (b) assembly and distribution of 200 pasture seed kits; (c) interim recommendations of grasses and legumes; (d) ecological studies on cogon grass; (e) establishment of seven grazing trials at different locations in the country; and (f) establishment of 11 fertilizer trials and 10 variety adaptability trials under various grassland soil types, different climate types and at different elevations. This program got off to an excellent start and with continuing vigorous leadership and support represents an approach that can have tremendous effect on national agricultural development.

#### *Visiting Professor at Cornell*

The third visiting professor from the UPCA at Cornell under the UPCO program was Dr. Ricardo M. Lantican who served as Visiting Associate Professor of Plant Breeding and Biometry for a year beginning September, 1967. He was chairman of the Department of Agronomy of the UPCA and later, at the termination of the UPCO program, was serving as Director of Research.

While at Cornell, Dr. Lantican collaborated with Professor Crowder in offering a course, "Crop Improvement—A World-Wide Review." He completed an outline for a book, "Crop Production in the Philippines" and prepared four of the chapters. Seminars were given and Dr. Lantican audited several courses that were of particular interest and value to him. Some greenhouse research was done on soybeans, using varieties obtained from Iowa State University with narrow leaves that would be particularly useful in his soybean research in the Philippines. Before returning to the Philippines, Dr. Lantican made arrangements for a collection of soybean varieties from many locations in the United States for his research program. Visits were made to major soybean growing areas to observe cultural and management practices as well as marketing systems.

#### VEGETABLE CROPS BREEDING AND PRODUCTION

Early in the UPCO program, Dean Umali and associates put high priority on assistance and support of instruction and research in vegetable crops. Arrangements were made, therefore, for a succession of visiting professors and graduate students to collaborate with UPCA staff and graduate students.

#### *Visiting Professors Contribute to Vegetable Program*

Professor J. E. Knott, former Professor of Vegetable Crops at Cornell and later at the University of California, who was recruited to assist with the campus development program for a period of three years (1964-1967) devoted part of his time to vegetable crops. He was followed by Dr. D. H. Wallace (1967-1969) and Dr. H. M. Munger (1969-1970), Professors of Plant Breeding and Vegetable Crops at Cornell, and two Cornell graduate assistants, J. R. Novak (1967-1969) and H. C. Wien (1968-1970). The last two Project Leaders, Dr. M. T. Vittum and Dr. E. B. Oyer, are both vegetable crops specialists and made contributions to the vegetable program. Dr. Vittum is head of Cornell's Department of Vegetable Crops at Geneva, and at the time he left for the Philippines, Professor Oyer was Head of the Department at Ithaca. One Philippine participant was sent to Cornell for advanced studies under the program, Mr. J. R. Deanon, Assistant Professor of Vegetable Crops.

Professor Knott gave six to eight lectures each year in the advanced vegetable course and counseled with staff on instruction and research priorities. UPCA staff had recognized for many years the need for a book on tropical vegetable growing that stressed the principles and basic knowledge on which production techniques and practices were based. Several of the staff had prepared some materials for such a book. Professors Knott and Deanon reworked these writings, added available

local research data, with interpretation and application, and *Vegetable Production in Southeast Asia* was published in 1967. This book discusses vegetable production on a crop-by-crop basis and is excellent for teaching and reference purposes.

During his assignment, Professor Wallace taught for one semester a graduate course in applied vegetable physiology. He gave numerous seminars in several departments and IRRI on his specialty of physiological plant breeding. He supervised the work of five M.S. candidates, including three instructors from Vegetable Crops, one from Farm Crops, and one agronomist from Farm Operations. In addition, he was cochairman for one Filipino Ph.D. candidate and served on two additional graduate committees as well as working with two Cornell visiting graduate assistants. Soon after his arrival he was invited by some of the Filipino staff to assist with operation of the photosynthesis field laboratory.

UPCA staff members were active in forming the Society for the Advancement of the Vegetable Industry of the Philippines. SAVI, established in 1966, has provided strong leadership and coordination for the vegetable industry involving personnel from more than 15 governmental agencies, plus many commercial companies and colleges.

Early in 1968 the Philippine government began to encourage increased vegetable production. The immediate impact on the UPCA was a greatly increased number of requests for training in vegetable production. The Vegetable Crops section responded with numerous training courses. With the cooperation of several staff members, Dr. R. L. Villareal and Dr. Wallace edited and published a *Vegetable Training Manual*. This well-written, beautifully illustrated manual complements the textbook edited by Professors Knott and Deanon and is especially helpful in training vegetable specialists. It includes up-to-date subject matter on vegetable seeds, planting, weeding, insect and disease control, and marketing of vegetables.

When Professor Wallace started his assignment, the operating budget for vegetable crops was less than 2,000 pesos per year. UPCA funding stimulated expanded vegetable work in several departments, but the need was for increased peso funding. Accordingly, a comprehensive proposal was submitted to the Food Production Coordinating Council requesting support for work on vegetable seed distribution and production, vegetable variety evaluation, training of vegetable extension workers, and research on cultural practices, vegetable physiology, marketing and post-harvest physiology. It was approved and the first one-year grant (1969) was 175,368 pesos. During this period, vigorous and aggressive leadership was provided by Dr. R. L. Villareal, with the assistance of younger staff. Dr. Villareal was Acting Head of the Vegetable Crops section, having transferred from the plant breeding section shortly before the arrival of Professor Wallace.

Professor H. M. Munger first served as a short-term consultant in January-February, 1964. When he returned in February 1969 for a one-year assignment, Professor Munger observed that (1) the number of applied and duplicating courses has been reduced; (2) relationships with the BPI seem much improved and active cooperation in research is evident; (3) more funds are available and can be expended without requiring so much nonproductive use of faculty time; and (4) the role of the College in extension programs is better defined and relationships with government agencies clarified.

Much of Professor Munger's time was devoted to advising graduate students in research, counseling with staff on instruction, research, and extension, and teaching in the training programs for extension and research workers from the BPI and other colleges cooperating in the National Vegetable Variety Education Program. He supervised the research of four Filipino graduate students and the two Cornell Ph.D. candidates.

Studies of the Filipino students dealt with inheritance of resistance in cucumber to a virus that may be unique and serious to the Philippines, and to breeding cabbage and tomatoes for heat tolerance.

Professor Munger reported impressive progress in variety evaluation and described it as being unique in Southeast Asia. The finding of heat tolerant cabbage and cauliflower varieties from Japan and Korea was particularly notable in that it makes possible the production of these crops almost anywhere in the Philippines at any time of the year, provided insects can be controlled. The Gulfstream cantaloupe was another notable finding. Its combination of resistance to downy and powdery mildews was especially important in permitting growers to extend their marketing season by early planting. And Professor Munger further observed that the greatest opportunity at this point (1970) appears to be in tomatoes where there is much promising material in the College breeding program that carries high temperature tolerance and/or bacterial wilt resistance. Both of these characters are being selected under conditions that are perhaps more rigorous than anywhere else in the world where such work is being done. Further, there was a great demand for tomatoes. Perhaps the greatest limitation in capitalizing on the variety evaluation program appears to be availability of seed of the superior varieties. Professor Munger therefore assisted in the establishment of a College Vegetable Seed Committee and served as its consultant in formulating long-range policies for the production, importation, and distribution of vegetable seeds.

Professor Munger and Dr. Villareal also started research on protein yields of vegetables and hopefully it will be followed by more extensive investigations. Assuming kilograms of protein per hectare per day as the best measure of efficiency in protein production, Mung beans picked at the edible-pod stage and mature soybeans were the best pro-

tein producers with over 9 kg. per hectare per day. Mature Mung beans or young pods of soybeans gave only about one-half as much protein per day. Harvesting the tender tips of sweet potato vines at weekly intervals provided a green vegetable with 2.4 per cent protein and tripled the yield of protein per hectare per day from the sweet potato crop as compared with harvesting only the roots.

Since protein deficiency is widespread among the Philippine population, it would seem that increased home garden or local market vegetable production would be one of the most rapid ways to step up protein production for the approximately 70 per cent of the population living in rural areas.

In some comments on graduate education in his terminal report, Professor Munger noted there had been a sharp increase in the number of graduate students during the 1969-1970 year up to a total of 12 in vegetable crops. But he expressed some concern about graduate education in the Department of Agronomy:

"One wonders whether plans for the teaching of courses are made far enough in advance and whether some faculty members are given the time needed to develop the material for a course and meet regularly with the class. Committee work and assignments in extension or public service activities seem to be demanded of faculty members on unduly short notice and without regard to conflicts with teaching duties. There is need for better communication in both directions between faculty and administration when such conflicts arise.

"One also wonders if graduate students are getting the maximum benefit from the faculty talent in the department. In addition to the formal courses and contacts with his major advisor from which a student gets so much of his training, there is potentially a great deal to be gained from faculty members not involved with a student in either of those two ways. This problem is not unique to UPCA by any means, but one senses here a particularly strong desire on the part of students to have more professional interaction with the faculty as a whole to which the latter have not been particularly responsive.... A truly good graduate education program needs to develop an atmosphere of intellectual stimulation, a sharing and testing of new ideas, an enthusiasm for new findings, a sense that faculty and students are learning new things together."

### *Cornell Graduate Student Activities*

As part of the continuing relationships in vegetable crops, a Ph.D. candidate at Cornell, Mr. J. R. Novak, was at Los Baños for two years as a teaching and research assistant and for his thesis studies. His thesis research dealt with the Gynoecious characteristics of cucumbers and the physiological and genetic factors that influence them. The contrasting temperatures and day lengths at Ithaca, New York, and Los Baños, Laguna, provided valuable insights on this thesis problem. In

carrying out his research, Mr. Novak discovered resistance to a Philippine virus in a white fruited native cucumber, which he was growing because it is highly male and late flowering, and he also found that the resistance is largely dominant in inheritance.

Mr. Novak was very active in teaching, giving many lectures and much laboratory instruction. He revised and reorganized many laboratory outlines. Laboratory emphasis was shifted to growing plants in plots and diagnosing the problems of these crops. Mr. Novak assisted in the preparation of laboratory exercises dealing with the production of transplants, transplanting and direct-seeding, and planning a home garden. He helped plan and execute a sale of plants grown in the laboratories by the students. The objectives were to stimulate the students' interest in the plants they were growing by sexual or asexual propagation, to demonstrate that horticulture can be profitable, and to generate funds for new materials and supplies needed in the course. The public was much interested in the plant sale, and it was an effective way to introduce new vegetables and flower varieties.

Mr. H. C. Wien was the other Cornell Ph.D. candidate to serve as a teaching and research assistant in Vegetable Crops. His research dealt with the influence of spacing on the efficiency of utilization of sunlight by navy (dry) beans in production of total plant dry weight and seed yield under temperate and tropical conditions. The problem was chosen because the technique of growth analysis has not been previously used on this crop under tropical conditions. Also, there was increasing interest in Philippine-grown navy beans for the canning of pork and beans. The experimental procedure consisted of measuring leaf area, dry weight and other attributes of plant growth at weekly intervals while simultaneously measuring the light intercepted by the plants. Light measurements were made using small packets of light-sensitive ozalid paper in small plexiglass holders which allowed light to hit the packet through a hole one-quarter inch in diameter. The light bleaches successive layers of the paper and this, when calibrated with a standard light-measuring instrument, can be used as an inexpensive and simple light meter of reasonable accuracy. Several Ph.D. and M.S. candidates used the technique to measure the light interception of different crops.

Earlier work at Los Baños had indicated that navy beans could be grown successfully during the cool months but did poorly during the rest of the year. To obtain more information, Mr. Wien and his Filipino counterpart, Mr. J. M. Soriano, tested 19 North American lines and obtained comparable results, but further testing indicated that some Puerto Rican varieties might be better adapted to Philippine conditions than the temperate North American varieties. The better adaptation seemed to be partly due to a stronger root system that gives the plants some measure of drought resistance, an important factor in the warm dry season.

Mr. Wien taught the introductory course in vegetable production one semester and assisted throughout his stay with training courses. One of his most productive experiences was the organization of and participation in the Vegetable Crops Discussion Group which had been originated by Professor Munger. These were weekly sessions involving the staff and graduate students to discuss current subject matter topics, make visits to the fields to become familiar with the research of other staff members, and hear reports of field trips in the Philippines or abroad. These discussions helped to foster cooperation on research projects and unified the staff in their attacks on the problems confronting the vegetable industry of the Philippines. They were especially valuable to the graduate students.

In his terminal report of activities in the vegetable crops section of agronomy, Professor E. B. Oyer made these observations:

1. The attitude and enthusiasm of the staff in setting priorities and soliciting funds to implement work directed toward meeting national goals is commendable. It is hoped that the process of self-evaluation and realignment of priorities in view of the changing situation will continue.
2. The balance between applied and basic studies is good. It is especially encouraging to observe the desire of the graduate students to conduct meaningful research which will be of direct benefit to their countrymen.
3. The reappraisal of staff development efforts should be continued so that more phases of the vegetable industry will be serviced.
4. The continuing attention to course offerings, content and evaluation is commendable. The true value of the undergraduate thesis should continue to be questioned.
5. The mobility of the staff in regard to in-country travel to view firsthand the problems and opportunities of their constituents is good.

#### POMOLOGY—FRUIT CROPS

Like other tropical countries, the Philippines is rich in many tropical fruits, the principal ones being coconuts, bananas, pineapples, citrus, mango, and papaya. Although acreages of the major tropical fruits are large, there has been little export of fresh fruits. Only limited research has been done in the Philippines on handling and storage of fresh fruits. Because of lack of know-how and lack of storage facilities, large quantities of fresh fruits have gone to waste. Several trial shipments of bananas to Japan and Hong Kong had not been very successful because of a lack of knowledge of the refrigeration requirements of this fruit. The potential for extending the local market for fruits such as mangoes, bananas, and citrus is enormous.

With this existing situation, Vice-President Umali asked for a visiting professor to help the College expand its research and education program with tropical fruits. Cornell responded by sending Dr. R. M.

Smock, Professor of Pomology, who is internationally recognized in his field, especially for his work on controlled atmosphere storage of fruits.

During his first semester, Professor Smock taught the course, "Post-harvest Physiology and Storage of Tropical Fruits," which was taken by approximately 20 graduate students. A detailed syllabus was mimeographed for the use of others in teaching this course.

Professor Smock gave three M.S. candidates close direction and assisted two others who had started under the direction of Professor Musgrave, with the completion of their work. He also directed six senior thesis students from Home Economics of the Diliman campus during their studies of mango and banana storage.

Professor Smock stimulated and directed a large number of applied research projects dealing with storage problems of bananas and other fruits. It was found that fruit condition of bananas held at outdoor (ambient) temperatures of 70°-90°F. was greatly improved by storing them in 150 gauge polyethylene. Sealed bags were slightly better than perforated ones. The work of one of the Filipino M.S. candidates helped to delineate the proper maturity for harvest for long-time storage of bananas. If the bananas had started the climacteric rise of respiration, their potential storage life was very short.

Another graduate student found that 58°-59°F. was a safe temperature range for the storage of Lacatan bananas. Relative humidity at high levels greatly decreased chilling damage. Low oxygen decreased chilling damage and high carbon dioxide levels increased it. Extensive experiments with Lacatan and Dwarf Cavendish bananas were conducted with different oxygen and carbon dioxide levels. These bananas were stored successfully for three weeks at 6 per cent carbon dioxide and 2 per cent oxygen at 60°F. This would mean that varieties could be shipped during a three-week voyage under controlled atmosphere conditions.

Tropical temperatures are too high to bring ripening bananas to best color and quality. It was demonstrated for the first time at Los Baños that Bungulan and Cavendish varieties would develop a beautiful yellow color if ripened at 60°-64°F. with acetylene gas as a stimulant for ripening. It was expected these research problems on bananas would be continued by the young staff members who had learned the various techniques by working with Professor Smock.

One of the major problems in teaching and research with tropical fruits at the College is the small land area devoted to fruit production. And with the campus development program much of the small orchard site was destined to be replaced by new buildings. A larger block, 40 to 50 hectares, that could be shared with other departments, especially Entomology and Plant Pathology, would provide the number of trees required to answer many of the questions that need answers. Would it pay to irrigate during the dry season? Could materials such

as rice straw and rice hulls that are currently burned be used for mulching purposes? Can the mango be made to flower more regularly and more heavily? The post-harvest physiology and storage of fruits and vegetables need to be studied in detail and hopefully these things would be done as a result of the stimulation of Dr. Smock's work.

Some eighteen months after Professor Smock returned to Cornell, one of his Ph.D. students, Mr. Roger Dutcher, went to Los Baños under the UPCO program for his dissertation research. His problem had been suggested by Dr. Ramon Valmayor. The purpose of Mr. Dutcher's work was to find out whether smudging did indeed induce flowering in the mango, and if so, why. In addition, he examined the possibility of duplicating the effect in a more efficient, economical manner through plant growth regulators.

Since a suitable mango orchard was not available at the College, arrangements were made to make these studies in the mango orchard owned by Mr. Servillano Yuson in Nueva Ecija, about 175 kilometers north of the College. Incidentally, Mr. Yuson is a graduate in Engineering from Cornell University. He was an excellent cooperator and allowed Mr. Dutcher complete access to his excellently managed orchard, and assisted and actively encouraged the research efforts. Apparently, Mr. Yuson was happy with the arrangement and the results because one group of trees was later named the "Roger Dutcher Trees."

One basic hypothesis in the research was that flowering in the mango might be induced by a particular combustion product of the smudge fire. Ethylene gas, a logical combustion product, had been shown to be the active agent in the flowering of other plants. One of the new experimental growth regulators, Ethrel, was known to release ethylene upon absorption by plant tissues. Along with several other compounds, Ethrel was used as a foliar spray. Of all chemicals used, only Ethrel showed a direct, positive effect on flowering. It was believed that potentially Ethrel could be used commercially to induce off-season or regular and heavy seasonal flowering. Also, this work indicated that the flowering produced by the chemical treatments may be more uniform and more regular than that produced by smudging.

A long-term experiment to evaluate the effects of nitrogen on young mango trees was initiated in the Yuson orchard. Another study was started to develop measures to control the mango fruit borer.

These experiments could have an important effect on the mango industry in the Philippines and were also effective in establishing cooperation between UPCA and a private grower that could be very valuable as a model in future research activities directed at problems of Philippine agriculture.

## PHYSICAL SCIENCES AND NATURAL RESOURCES

Physical sciences and natural resources at the UPCA include activities in four departments: Agricultural Engineering, Agricultural Chemistry, Applied Mathematics, and Soils. Instruction in Physics and Statistics is a part of Applied Mathematics. This department was organized in 1964; prior to that time staff members in these areas were in the Department of Agricultural Engineering.

As noted in the following tables, there was a relatively low proportion of well-trained staff in each of these departments in 1963. Some notable improvements have been made during the past ten years in some of the departments, but in other cases key staff members have left the College. Even though progress has been made, there is still much to be done in the development of the basic sciences of Chemistry, Physics, and Mathematics to desirable levels of quality and depth of staff necessary for the undergraduate instructional needs of the College and for high-quality graduate studies.

Distribution of academic staff by rank and level of training for the departments in the Physical Sciences is shown in Tables 14 and 15.

TABLE 14. Distribution of Academic Staff in the Physical Sciences by Rank, 1963 and 1973

	Agr. Eng.		Agr. Chem.		Applied Math.		Soils	
	1963	1973	1963	1973	1963*	1973	1963	1973
Professor .....	2	-	2	2		-	1	-
Assoc. Professor .....	-	2	-	-		1(1)†	-	2(1)†
Ass't. Professor .....	2(1)†	5	-	11(2)†		6	2(1)†	10(4)†
Instructor .....	27(3)†	15(8)†	28(3)†	12(7)†		8(1)†	13(3)†	7(4)†
Ass't. Instructor .....	3	1	3	1		-	2	1
Research Ass't. ....	1	1	-	2		-	12	3
Total .....	35(4)†	24(8)†	33(3)†	28(9)†		15(2)†	30(4)†	23(9)†

\*Part of Agricultural Engineering in 1963.

†Numbers in parentheses refer to staff on leave.

TABLE 15. Distribution of Academic Staff in the Physical Sciences by Level of Training, 1963 and 1973

	Agr. Eng.		Agr. Chem.		Applied Math.		Soils	
	1963	1973	1963	1973	1963*	1973	1963	1973
Ph.D. ....	2	4	1	9		6	3	12
M.S./M.A. ....	6	12	7	3		3	8	4
B.S./A.B. only .....	27	8	25	16		6	19	7
Total .....	35	24	33	28		15	30	23

\*Part of Agricultural Engineering in 1963.

## AGRICULTURAL ENGINEERING

The first Cornell visiting professor under the UPCO Program was Dr. Gilbert Levine who arrived at Los Baños in September, 1963, for work in the physical sciences area, with major emphasis in the Department of Agricultural Engineering. In his first report to Vice-President Umali, after three months at the UPCA, Professor Levine outlined the major problems facing the Department. They were essentially the same as those cited by Professor O. C. French in his terminal report in 1959 and were as follows: (1) lack of senior staff; (2) high rate of staff turnover; (3) excess number of courses; (4) research inactivity; (5) inadequate teaching quality; and (6) department diversity. Obviously there was much to be done to raise the quality and stature at all levels in Agricultural Engineering if it was to fulfill its proper role in the Philippines.

The breadth of subject matter areas was reduced somewhat when the Mathematics, Physics, and Statistics personnel were transferred in 1964 to form a new Department of Applied Mathematics.

Early in the UPCO Program, the Project Leader's office made a survey of staff trained abroad during the period 1952-1960 under ICA-NEC support of the Cornell-Los Baños Program and the Rockefeller Foundation scholarships. This survey showed that approximately 80 per cent of this group of more than 100 individuals were still at the UPCA. But in the area of Physical Sciences, only 40 per cent were still at the College and in Agricultural Engineering it was less than 20 per cent. It was quite clear that staff members in Agricultural Engineering had not received the necessary incentives to continue their careers with the College. There was only a handful of senior staff in the department with relatively little to offer at the graduate level.

But excellent progress began to take shape during the next two years (1964-1966) in partially solving the problem of teaching and research quality in the staff. Through several sources of support, including UPCO, three staff members were pursuing M.S. programs abroad and one was on a Ph.D. program. Two additional staff members were accepted for M.S. studies starting in the 1965-1966 academic year. And one staff member, Dr. Dante de Padua, had recently returned from Michigan State University after completing the Ph.D. With more trained staff available the critical need then was to provide them with support and encouragement so they would remain at the College and develop the leadership so badly needed for the training of agricultural engineers.

Soon after his arrival, Professor Levine was requested to help in the preparation of building plans for the five-year development program. This provided an unusual opportunity to meet and work with a broad cross section of the staff and to become thoroughly familiar with the goals of the College.

### *Irrigation System Designed for Experiment Station*

A serious impediment to the conduct of dry-season research at the UPCA was lack of irrigation facilities for the upland area of the Central Experiment Station. To assist in removing the impediment, funds were provided by the Ford and Rockefeller Foundations and the U.P. budget for designing and constructing a comprehensive irrigation system to serve the 40-hectare upland area. Initial studies of water requirements and water supplies by Professor Levine and the UPCA staff provided the basis for water supply development. Conferences with research staff from many departments revealed the water distribution needs of the College research program. An interrelated set of gravity and pressure systems was then designed to provide for present needs and for the flexibility to adapt to future demands. The associated surface drainage system was included in the irrigation system design. Construction was programmed over the next couple of years.

In addition to the obvious benefits of water availability, this project provided an opportunity for a number of staff members to gain experience in the planning, design and construction problems associated with upland irrigation systems. This was of special value, considering the national interest in irrigation that was developing, and the general lack of such experience.

### *Professor Levine's Second Assignment*

In order to assist further in the development of agricultural engineering at Los Baños, Professor Levine was requested to return for one year beginning in the summer of 1968. One of his M.S. graduate students at Cornell, Senen Miranda, had returned to the UPCA and worked closely with Dr. Levine throughout his assignment. Also, two of Dr. Levine's Ph.D. graduate assistants at Cornell already had started their thesis research on water losses and water management in lowland rice irrigation in the Philippines. An additional Ph.D. graduate assistant from Cornell would be going to Los Baños which would provide a continuing approach to important water management problems over a span of several years.

Returning after a period of three years, and after this additional year of teaching and research in the department, Professor Levine noted in 1969 that substantial progress in Agricultural Engineering had taken place:

"Five years ago, the Department of Agricultural Engineering had one staff member with a doctoral degree, had a record of steady loss of trained staff, had only a minimal research program, had less than ten students in its professional engineering program, had approximately six part-time (staff members) graduate students, had only a very few graduate level courses, and was committed primarily to the undergraduate teaching program of the College.

"Today, the department is still at an early stage in its staff development, with three staff members having attained the doctorate level; almost all others are actively engaged in the academic phase of their professional development. Notwithstanding this limited staff, the department now has over one hundred students in its professional program, has introduced a number of basic engineering science courses to support its teaching program, has developed a comprehensive research program in the storage and processing field, has initiated a strong program in the field of soils and water, and is developing its research activity in the area of mechanization. Eleven graduate students (nine staff members and two non-staff) are working for their M.S. degrees, and a number of graduate courses have been developed. A spirit of enthusiasm and cooperation is prevalent. The potential that was evident five years ago is being realized, though *the structure is still fragile and in need of support*. There is evidence of administrative support in the level of research funding, and in the promotion to assistant professor rank of two staff members who have not yet obtained their doctorates. It has been a genuine pleasure to note this support, and to see the vigor and effectiveness with which the department has been moving."

It was evident that the earlier decision to teach the complete five-year program of the professional curriculum at Los Baños rather than part of it at Diliman was a very significant action. The dramatic increase in the number of students in the professional engineering program from less than 10 to more than 100 gives some indication of the probable impact.

The major factor in research expansion had been active and capable departmental leadership provided by Dr. Dante de Padua. The role of the UPCO funds in permitting effective application of this leadership was readily apparent. And of utmost importance, the additional staff of Professor Levine and his Cornell graduate assistants, Jacob Kampen, Thomas H. Wickham, and Alan C. Early, made it possible for more rapid expansion of the soils and water research than otherwise would have been possible.

The research initiated by Professor Levine and his associates included agronomic, economic, and social aspects in addition to engineering, and represented a broad attack on important problems. The impact of this research was already being felt at the national level. For example, the research on water losses by J. Kampen raised serious questions about the planning considerations for the 320 million peso Upper Pampanga River project. The study of rotational irrigation by S. M. Miranda and others was influencing the planning for implementation of the practice by the National Irrigation Administration.

Cooperative studies on the interaction of irrigation, varieties, and nitrogen fertilization on the yield and sugar percentage of sugar cane involved staff in Agronomy, Soils and Agricultural Engineering, as

well as Alan Early. The latter incorporated these studies in his thesis dealing with the optimization of the sugar producing system in the Philippines. The results of this study, in cooperation with individual planters and two sugar centrals, should be an important input into government policy decisions about irrigation investments in the sugar areas.

#### *Cooperation Improved Between the UPCA and NIA*

In March, 1968, a Memorandum of Understanding was signed by the National Irrigation Administration (NIA) and the UPCA to provide for cooperation in water management research. This was essential for the field studies being conducted by J. Kampen and T. H. Wickham, and for others from the UPCA to follow. From this beginning it was hoped that strong and mutually beneficial relationships would exist between the NIA and the UPCA.

A side benefit from this cooperation was provided by Mrs. T. H. Wickham, an M.S. candidate in rural sociology at the UPCA, who studied the social factors associated with irrigation.

#### *Keeping Cooperators Informed*

Successful field studies, such as those of Mr. Kampen and Mr. Wickham, required the interest and cooperation of the farmers and the field NIA staff. As experimental results accumulated, an effort was made to keep both the NIA and the farmer cooperators fully informed on what was being learned.

In appreciation of the cooperation and hospitality they had received from these farmers who had collected data in the field, Mr. and Mrs. Wickham invited them and their families, thirty to forty people, to visit Los Baños. Staff members from the College who were interested in the project met with them and the head of the department gave certificates of appreciation to each of the farm families who had cooperated on the project. This was good public relations, and the example might well be followed more often by the College staff.

It was clearly evident that the entire water management research project had fulfilled a very important role in getting the College out into the field with some of its research. It was having a very favorable effect upon the image of the College in its relationships not only with farmers but also with other government agencies.

#### *UPCA Graduate Students*

After returning to Los Baños in 1967 following M.S. studies at Cornell, Mr. Senen Miranda became more actively involved in water management research, and it became evident that he would be the leader in continuing this area of work after the departure of the visiting

staff and graduate students. Accordingly, Mr. Miranda returned to Cornell in 1969 to do course work for the Ph.D., with the thesis research to be done in the Philippines beginning in 1971. His field research in the Upper Pampanga river basin has been on the effects of physical control parameters on Philippine lowland rice irrigation system performance. He expects to complete his thesis and other requirements of the Ph.D. at Cornell in September, 1974. While doing his thesis research, Mr. Miranda served as Water Resources Commodity Team Leader of the Philippine Commission on Agricultural Research.

Professor Levine returned to the Philippines for a six-weeks' consulting assignment early in 1972 to assist Mr. Miranda in designing his field studies and for consultations on the entire water management research program.

Another young staff member, Mr. M. R. deVera, also was sent to Cornell for advanced training in agricultural engineering. After spending two years he obtained an M.S. degree and returned to the UPCA for Ph.D. studies and for research in the water management team.

Mr. Emerico Mendoza who was interested in food science engineering was sent to Cornell in 1971 for one year of courses under the UPCA Ph.D. phase of the UPCO program. Since he felt that he was not getting the kind of courses desired, Mr. Mendoza transferred to the University of Massachusetts for the spring semester 1972. He returned to Los Baños in June 1973 to rejoin the staff in agricultural engineering where he will complete his graduate study for the Ph.D. from the University of the Philippines.

## AGRICULTURAL CHEMISTRY

From the beginning of the UP-Cornell Graduate Education Program the need for strengthening the basic science areas was fully recognized. This was particularly true in Agricultural Chemistry where greater depth was needed in the faculty, especially in organic chemistry. Several staff members were abroad for advanced training, and it was hoped they would fill some of the gaps, but the need existed for additional well-trained experienced staff.

### *Staff Development*

The first UPCO participant in agricultural chemistry from the UPCA was Mr. Ernesto del Rosario, a young instructor in Chemistry and a graduate from the University at Diliman. He entered Cornell as an M.S. candidate in February 1964 and completed the degree two years later in 1966 with a major in Physical Chemistry. After 18 months back on campus teaching at Los Baños, Mr. del Rosario was selected for a second time as an UPCO participant and he returned to Cornell as a Ph.D. candidate in 1967. Again he majored in Physical

Chemistry with one of his minors in Bio-organic Chemistry, completing the Ph.D. at Cornell in June 1970.

Mr. del Rosario's thesis research on kinetic studies on Ribonuclease A and mitochondrial malate dehydrogenase was very basic, but along with his course work, it provided excellent training for teaching graduate courses in enzymes, proteins, kinetics and thermodynamics at Los Baños. Also, his thesis research prepared Mr. del Rosario for an active research career that will have agricultural and industrial relevance in the Philippines. As he reviewed his research in March 1972, Dr. del Rosario pointed out that he had been successful in getting a substantial grant from the National Research Council and was actively engaged in research along with his teaching. Some of his enzyme research was cooperative with scientists at IRRI.

Another graduate student, Mr. Carlito Barril, went to Cornell in 1966 under the UPCO program as an M.S. candidate in analytical chemistry. His research on the influence of pressure drop on the efficiency of gas chromatographic columns was rather fundamental, providing a good working knowledge of the basic principles of a major analytical tool. This would be very helpful in designing analytical problems involving chromatography in applied research at the UPCA.

Later in 1972 under the UPCA Ph.D. phase, Mr. Barril returned to Cornell for one semester of courses. His advisor, Dr. Roger G. Young, Associate Professor of Entomology, had been at Los Baños earlier and assisted Mr. Barril in arranging for a course of study that would be helpful to him for research in the pesticide laboratory. This laboratory functions jointly between agricultural chemistry and entomology at the College.

Even though the UPCA sent only two of its staff in Agricultural Chemistry for advanced training under the UPCO program, several others pursued graduate studies abroad under other sources of funds.

Four Filipino staff members in Agricultural Chemistry and one from the Forest Products Research Institute completed M.S. degrees as advisees of Cornell visiting professors. There were no Cornell graduate student participants with majors in Agricultural Chemistry under the UPCO program, but two graduate assistants in Agronomy, Heichel and Palmer, served as teaching assistants in the course in General Chemistry during their first semester at Los Baños (1964). They participated in many chemistry seminars, collaborated with Peace Corps volunteers who were bolstering the Department, and significantly contributed to teaching in an area that was closely allied to their academic interests.

### *Visiting Professors*

Cornell was unable to recruit visiting professors from its Chemistry department which is located in the College of Arts and Sciences. As a

result, they were recruited from Agriculture from among those with in-depth training in Chemistry and Biochemistry.

The first of these was Dr. B. L. Herrington, Professor of Dairy Chemistry, who went to the UPCA on a three-year assignment as Visiting Professor of Agricultural Chemistry in 1964. He was one of Cornell's eminent teachers and research scientists. Professor Herrington gave much emphasis to improvements in teaching and in curriculum development. During his period of service, the College changed from a four-year to a five-year curriculum with one of the most important changes in the basic chemistry course. Only one term had been allotted to general chemistry, plus organic, but beginning in 1967 two full terms were devoted to general chemistry and a third term to organic chemistry. Professor Herrington taught courses in dairy chemistry, electronics and instrumentation for chemists, library practice and chemical literature, chemistry of foods, and history of chemistry. Detailed and complete notes and syllabi and reference cards on chemistry of foods were left in the Department for assistance to colleagues and students. Emphasis was given to the improvement of the library, textbooks for students, establishment of a scientific store and computing center on campus, and improved equipment for teaching and research. In addition, Professor Herrington gave a series of lectures during one term on milk and milk processing at the Veterinary School at Diliman.

As successor to Professor Herrington, the next visiting professor in Agricultural Chemistry was Dr. D. Ralph Strength who was borrowed from Auburn University for a period of two years beginning July, 1967. He had obtained his Ph.D. in biochemistry, with a minor in organic chemistry, at Cornell a few years earlier. His assignment was to assist in teaching graduate courses, to initiate new research projects that involved Filipino staff and graduate students, and to work cooperatively with the staff in teaching, research, and advising of graduate students.

When Professor Strength joined the staff at Los Baños there were only four staff members with the doctoral degree, three with the M.S. degree, and fourteen holding the B.S. degree. In addition to heavy teaching loads in Chemistry, the four senior staff members taught German, Geology, Food Science, and Sugar Technology courses. Professor Strength taught advanced biochemistry courses in proteins and enzymes and special problems courses. A joint M.S. degree program in Food Science had been developed with the College of Home Economics at Diliman. Professor Strength taught a course in high protein foods at Los Baños and at Diliman, dealing with basic chemistry, nutrition, protein evaluation and protein food processing.

Construction of the new Physical Sciences Building had been delayed and teaching of Chemistry at Los Baños still was being done in the old building. In his terminal report, Dr. Strength observed:

"The continued delay in completion of the Physical Sciences building has seriously impaired the teaching and research program of the department. The inefficiency that arises from overcrowded and archaic facilities is beyond description. To conduct classes and laboratories on a day-to-day basis in the current facilities of the Department of Agricultural Chemistry is nothing short of a miracle that is accomplished daily by the staff of the department."

Professor Strength was the major advisor for three graduate students who completed M.S. degrees during his assignment, and a fourth one was almost completed. Through his own activities and those of his graduate students, Professor Strength and his Philippine colleagues were very productive in research with meaningful results for the Philippines. The preparation of papain from papaya latex was described and optimal conditions for its use were developed for the production of fish hydrolysates. Methods were developed for the extraction and recovery of coconut protein. An extensive study of rice and peroxidase showed that peroxidase levels are intimately linked with dormancy and germination of rice seeds. A long-range investigation was planned that would involve critical evaluation of protein-rich materials from indigenous sources. Initially chemical measures would be used, followed by animal evaluation.

Jointly with Dr. Alicia C. Santos, a manuscript was almost completed for a book, *The Biochemistry of Amino Acids and Proteins*, to be submitted to the College textbook board. Also, bound copies of lecture notes, *Outlines of Chemistry and Physiology of Proteins*, were left in the department.

After a brief overlap with Professor Strength early in July 1969, Dr. John N. Hathcock continued the work in Biochemistry at Los Baños. Just two years out of his Ph.D. training in biochemistry and nutrition at Cornell, Dr. Hathcock took over the instruction in biochemistry of amino acids and proteins and later developed a course on biochemistry of the mineral elements and vitamins. Both of these courses were at the graduate level. A syllabus, *Chemistry and Biochemistry of the Mineral Elements*, was prepared and copies were presented to the Departments of Agricultural Chemistry and Animal Husbandry. Dr. Hathcock was the major professor for one M.S. graduate student, served on the graduate committee for two others, and two Cornell Ph.D. candidates, one in food science and one in animal nutrition.

Dr. Hathcock's research, much of it in cooperation with Filipino staff in animal nutrition, was concerned with the chemistry, biochemistry, toxicology, and nutrition of a tropical legume, *ipil-ipil*. This plant produces a large amount of high-quality protein at a comparatively rapid rate, but it contains a toxic amino acid, mimosine. It was felt that studying *ipil-ipil* could prove to have immense practical

value if the toxic principle could be removed or detoxified. Some progress was made in this direction.

A fourth visiting professor, Dr. Roger G. Young, Associate Professor of Entomology at Cornell, had a dual assignment of 18 months at Los Baños. His major responsibility was to assist with plant residue studies, primarily in Entomology, but because of his training in organic chemistry he was assigned to Agricultural Chemistry for assistance in teaching qualitative organic analysis. He taught several courses, mostly in cooperation with Filipino staff members, including organic analysis, literature and history of chemistry, colloid and electrochemistry, organic chemistry, advanced organic chemistry and advanced laboratory techniques. Professor Young was major professor for one M.S. student.

The Philippines is rich in oil-bearing plants; therefore, in cooperation with two Filipino associates, studies were initiated on flavors and essential oils of Philippine plants. Procedures for extraction of oils were worked out and preliminary information on identities was obtained.

#### SOIL SCIENCE

In comparison with the other departments in the Physical Sciences, the Department of Soils (later Soil Science) was relatively strong at the beginning of the UPCO program in the depth and level of training of its staff and its equipment and facilities. Others would be returning soon from graduate studies abroad. Because of this, priority was not given to visiting professors in Soils. Substantial support, both in personnel and equipment, had been provided by Cornell during the earlier ICA-NEC project 1952-1960.

#### *Graduate Student Exchanges*

Under the graduate student component of the UPCO program, three Cornell Ph.D. candidates in Soil Science went to Los Baños and one Filipino, Mr. Igmidio T. Corpuz, went to Cornell for his course work and returned to Los Baños for his thesis research. One of the Americans, Mr. Frederick Magdoff, separated from the project after about seven months and completed his degree program at Cornell.

Immediately after arrival at Cornell, Mr. Corpuz had an opportunity to spend a few weeks assisting with a drainage-rotation-fertilizer experiment on a private farm in Northern New York. During the following two summers he was involved with several different types of experiments which gave him a good opportunity to observe and learn techniques from different experienced investigators. After returning to Los Baños, Mr. Corpuz conducted research to determine the response of several crops, including sweet corn, soybeans, mungo, peanuts and sweet potatoes, when grown in the field to differences in clod size resulting from degrees of tillage. Another objective was to

determine if the adverse effect of a coarser soil surface could be overcome by nitrogen fertilization and to observe if there was any interaction between tillage and nitrogen. The thesis research of Mr. Corpuz was supervised by Dr. Reeshon Feuer who was at Los Baños as a visiting professor of Agronomy and Soils.

The first graduate assistant in Soils in the program from Cornell was Pedro A. Sanchez who went to Los Baños for two and one half years in January, 1965. His thesis advisor was Dr. Richard Bradfield who was actively engaged in multiple cropping research at IRRI at this time. In addition to his thesis work, Mr. Sanchez made a characterization of the principal soils of Luzon and Mindanao which served as a base for various research projects conducted since by Filipino professors and graduate students. Also, he taught an undergraduate course in soil fertility for two years and a soils seminar for one year. To aid in his teaching and that of others, Mr. Sanchez prepared a Syllabus on Tropical Soil Fertility that has served effectively in lieu of a textbook.

Mr. Sanchez studied the performance of rice under several granulated and puddled soil cropping systems. It was found that puddling representative Philippine lowland rice soils did not increase rice growth and soil nutrient uptake under conditions of restricted or no leaching. Puddling decreased losses of applied N in field and barrel conditions, which resulted in higher yields in the field. The advantages of puddling tropical rice soils did not seem related to increases in nutrient availability but, rather, to indirect effects of water relations.

The last Cornell graduate student participant in soil sciences was Warren R. Philipson who was at Los Baños from August 1970 until June 1972. He taught a graduate course, "Introduction to Aerial Photographs," and in cooperation with a Philippine colleague a second course, "Aerial Photographs for Land Analysis." Mr. Philipson's thesis research dealt with air-photo crop analysis in tropical resource evaluation. Gathering of data through questionnaires necessitated the cooperation of provincial soil technologists which was obtained through the Director of the Bureau of Soils (BS). At this writing Mr. Philipson has not completed the thesis, but hopefully this will be done in 1974.

### *Visiting Professors*

Dr. David R. Bouldin, Professor of Soil Science at Cornell, spent his sabbatical year, 1968-1969, at Los Baños assisting with teaching and research in soils. He taught a graduate course in advanced soil fertility and collaborated in offering an undergraduate soil physics course. Further, he worked with eight graduate students in special topics in soils.

In his research, Professor Bouldin devised procedures for measuring oxygen consumption by flooded (reduced) soils and for studying the

oxygen consumption characteristics of the Maahas clay. It was hoped that expanded studies of this type might provide answers to the question why rice yields are better under flooded conditions than under upland conditions. An understanding of this question would be very helpful in development of better water management schemes both for traditional paddy culture and for less traditional patterns where paddy rice and upland crops are grown in rotation. Another series of experiments was concerned with behavior of fertilizer nitrogen broadcast on paddy. The results indicated that farmers were losing much of the nitrogen from broadcasting of fertilizers by volatilization of ammonia, particularly that part broadcast before an appreciable plant canopy has developed to shade the water. Other experiments by the staff of the UPCA and IRRI showed that placement at 10 cm. was much superior to broadcasting of fertilizer.

Utilization of visiting professors from other countries in Southeast Asia was one of the ingredients in the UPCO program. Accordingly, Dr. Thomas S. C. Wang from Taiwan served as Visiting Professor in Soil Science from June 1968 through May 1969. His major function was to introduce and develop modern techniques of soil biochemistry. Dr. Wang offered a special course for graduate students on the problems of soils and fertilizers of sugar cane. This was followed by another graduate course on advanced laboratory techniques in soil chemistry.

#### *Summary Comment on Work in Soil Science*

Throughout the UPCO program almost all of the key positions in the Department of Soil Science were filled with well-trained, capable individuals. Graduate education and research progressed very satisfactorily and the graduate level courses generally were well taught. The new building for soils and agronomy provided greatly improved facilities and equipment for the important functions of the department.

Graduate studies would be greatly strengthened, however, if greater utilization was made of the distinguished affiliated faculty members on the staff at IRRI. Unless high quality replacements are developed, losses of key personnel that were taking place in 1972-1973 could seriously affect the future teaching and research in soils in the program of the University at Los Baños.

#### APPLIED MATHEMATICS

One of the first young staff members to be sent to the United States for advanced training under the UPCO program was Mr. Serafin Talisayon, Instructor in Physics and a recent graduate from the Diliman campus. He was not accepted for a major in physics at Cornell, but entered the Cornell Graduate School in February 1964 as an M.S. candidate in Physical Biology, with a minor in Physics. His course of study

was laid out with the object of preparing him for teaching physics to undergraduate students in agriculture and for future research in biophysics, including the application of mathematical methods in biology, and radioactive tracer applications in biological and agricultural systems.

After successfully completing the M.S. degree, Mr. Talisayon returned to the UPCA for 18 months of teaching before going back to Cornell as a Ph.D. candidate in September 1967. All of his requirements for the degree were met at Cornell since adequate facilities and personnel in his field were not available at the UPCA. His major was in Physical Biology, with minors in Biochemistry and Animal Physiology. This provided a strong background in the biological sciences which complemented Mr. Talisayon's earlier training in Physics and Mathematics. He felt this would enable him to (1) pursue unique lines of teaching and research not possible with a purely physical or biological preparation, (2) undertake interdisciplinary work across the physical, mathematical and biological sciences with some measure of competence, and (3) discharge teaching duties in physics within an agricultural curriculum in a meaningful way.

Mr. Talisayon's Ph.D. dissertation dealt with a mathematical model of calcium and strontium movements in the mammalian body. Since it is unlikely that he would continue to pursue this specialized area of physical biology, Mr. Talisayon felt the major values derived from the thesis work were (1) familiarity with the subject matter of alkaline earth metabolism, specifically of fallout Sr-90, and (2) experience with the experimental methods and equipment used in the research.

Mr. Talisayon completed his Ph.D. program in 1970 but was granted an extension of his leave of absence by the UPCA and did not return to Los Baños until September 1972. During this time he worked as a research associate in the IRRPOS (Interdisciplinary Research Relevant to the Problems of our Society) program. This extension of his leave was granted so that his wife, Mrs. Vivien Talisayon, could finish her studies and Ph.D. dissertation in science education. She was provided modest financial support by the UPCO program to assist in her studies which were completed in 1972 at which time she accompanied her husband back to the Philippines where they assumed their positions in the UPCA. Soon afterward Dr. Serafin Talisayon was elected chairman of the Department of Applied Mathematics.

## FOOD AND NUTRITION

In the early planning stages of the five-year development program, Vice-President Umali and others recognized the need for trained people and expanded research in food science, food technology, and nutrition

to meet the needs of a rapidly growing Philippine food industry. Some work had been going on in these areas at the UPCA for many years, such as foods and nutrition, food microbiology, food analysis and sugar research, biochemistry and nutrition. But the work needed to be expanded and given greater emphasis in the College's programs. So one of the very first requests, as the UPCO program was developing, was for a consultant in food science and technology. Dr. David B. Hand, who at that time was Head of the Department of Food Science and Technology at the New York State Agricultural Experiment Station, agreed to spend two months beginning in December 1963 at Los Baños to consider the needs and requirements for a Department of Food Science and Technology in the U.P. College of Agriculture.

#### COMMITTEE ON FOOD SCIENCE AND TECHNOLOGY

Prior to Dr. Hand's arrival in the Philippines, a Committee on Food Science and Technology was appointed from the faculty to work with him. This committee included experienced and capable representatives from the Departments of Agricultural Chemistry, Agronomy, Home Technology, Animal Husbandry, Plant Pathology, and Agricultural Economics, with Professor Julian Banzon, Chemistry, as chairman. In the course of its deliberations and studies, the Committee visited many institutions and organizations and held conferences with representatives of all national and international institutions concerned with food and nutrition.

This committee recommended that if the College of Agriculture is to fulfill its function in a country that is rapidly becoming industrialized and urbanized, it must have a strong department of food science and technology. Further recommendations were:

1. That a laboratory building be constructed and located near the other departments of applied sciences.
2. That a curriculum be established for training at both the undergraduate and graduate levels.
3. That an interim program be established in collaboration with existing departments to prepare for effective utilization of the new facilities as soon as they become available.

Floor plans, lists of equipment, estimated budgets and other details were developed by the Committee. Research priorities were suggested; a curriculum was recommended; and a list of potential candidates for advanced training was prepared.

There was general agreement on the long-term need for expanded training and research in food science and technology, but there were some staff members, including the Cornell Project Leader, who felt that such a program should be delayed until greater faculty strength was developed in chemistry and the other basic sciences.

## VISITING PROFESSORS INITIATE FOOD SCIENCE RESEARCH

Three visiting professors from Cornell, each serving two years, contributed to the development of Food Science and Technology at Los Baños for the next six years starting with Dr. C. S. Pederson, bacteriologist, in 1965. He was followed two years later by Dr. K. H. Steinkraus, bacteriologist, and he in turn by Dr. M. C. Bourne, chemist and food technologist.

When Professor Pederson arrived at Los Baños, he found a small but enthusiastic group of staff members interested in food science who were concentrated in Agricultural Chemistry, but some were in Home Technology and Animal Husbandry. The proposed Department of Food Science and Technology had not been established and, as a result, there was no department head with whom the visiting professor was to work. Throughout his assignment, Professor Pederson, therefore, worked closely with Professors Banzon and Samaniego in Agricultural Chemistry and with various members of the advisory committee that had been appointed earlier. An active program of teaching and cooperation in research with these Filipino staff members was developed in dairy microbiology and food microbiology, as well as broader phases of food science and technology. In addition, Professor Pederson gave lectures in food microbiology in the College of Home Economics at Diliman.

Facilities and equipment for research were improvised and projects were initiated in several fields with members of the staff, and Professor Pederson served on special committees of seven M.S. graduate students. One of the students studied the microbiological and chemical changes that occur in fermentation of native sausage. The methods developed and the use of pure culture inoculation may reduce the rancidity and off-flavor developments that occur at times. Another studied malic and citric acid changes in carbon dioxide evolution during maturing of bananas. This type of study is essential if bananas or other fruits are to be used for manufacturing purposes. Incidental to this, another student showed a relationship between pectin content of bananas and maturity which seems to correlate with acidity development.

One of the UPCA staff members who worked with Professor Pederson throughout his assignment studied several fermented foods and demonstrated that most of them are the result of lactic acid bacterial fermentations. Particular attention was given to the study of cucumber fermentation, since the preparation of cucumber pickles was a relatively new industry in the Philippines and production was increasing very rapidly. Four relatively large companies were in operation and each of them was increasing its capacity. Cucumbers are fermented and cured as salt stock in a salt brine. The acid produced by fermentation is fully as important, if not more so, than the salt. All four of these

commercial companies were using salt concentration in their brines which would not permit bacterial growth in fermentation. Further, excessive plasmolysis of cucumbers occurred, bloating was excessive, and the cucumbers were subjected to extreme pressure. As a result, losses were quite excessive. Laboratory studies at the UPCA demonstrated the necessity of using salt concentration in brines which would permit rapid fermentation and acid production. Publications of these results made it possible for the commercial companies to apply the knowledge in their day-to-day operations. This type of research with direct application in industry provided a very desirable relationship for the UPCA.

Another observation with enzyme activity was observed in studies by one of the young staff members. This student had observed development of rancidity during dehydration of coconut milk. She was advised to heat the product to 180°F. to inactivate the enzymes and then cool to 140°F., the dehydration temperature under vacuum. Rancidity development did not occur in coconut samples treated in this manner.

These are only a few of the examples of applied types of research that were initiated during the two-year period of Professor Pederson's assignment. This type of research enthuses the student into delving further to try to determine scientific backgrounds for many natural occurrences. This training also aids the study and understanding of unusual occurrences in industry, such as sloughing of cucumbers, concentration of tomato puree, flavor, texture, and color defects and similar problems.

Although a Department of Food Science and Technology was not organized during Professor Pederson's assignment, a temporary organization within Agricultural Chemistry had been started with the appointment of Dr. Samaniego to head up activities in this division. Five other staff members of the Department were assigned to give attention to problems of food science and technology when their teaching duties would permit. The College-wide Food Science and Technology Committee that had been organized earlier was reorganized in January 1967 with Dr. Julian Banzon as chairman. This committee was requested by the administration to study the proposed plans for a food science and technology building and to update the report that had been made in February, 1964. The building plans were approved after several revisions by the committee; however, the funds appropriated for the building were not sufficient to allow for the facilities as originally planned. As a result, considerable revision of the building plans had to be made.

Professor K. H. Steinkraus continued with an ambitious program of research cooperative with interested staff members, not only in Agricultural Chemistry but also in several other disciplines. He gave major attention to the development of the temporary food science pilot plant



*Jacob Kampen (center) was one of 23 Cornell graduate assistants who did their Ph.D. thesis research at Los Baños. He is discussing his irrigation research with his major professor, Gilbert Levine (left) and a Filipino colleague, L. L. Piczon.*



*A large number of young staff members from the UPCA studied at Cornell under the UPCO program. Here a group of them study a soil profile with Professor Matthew Drosdoff.*



*Research and graduate training in food science expanded greatly under the UPCO program. M. C. Bourne, Visiting Professor of Food Science and Technology, conducts research with Philippine colleagues to produce Philsoy, a high-protein beverage from soybeans.*



*D. Ralph Strength, Visiting Professor in Biochemistry, assisted in the development of graduate education and research in agricultural chemistry and food science. He is demonstrating to Filipino and American graduate students methods of purification of papain.*



*Dr. Emilio U. Quintana, Chairman of Agricultural Economics, instructs a group of research assistants in proper procedure for statistical analysis. This air-conditioned computer center was established with funds from the UPCO program.*



*The instructional program of the College was strengthened greatly with new equipment obtained under the development program. Shown here is some broadcasting equipment for the campus radio station.*



*Vice-President Umali explains the College's program to United States' Secretary of Agriculture Orville Freeman; U. S. Ambassador to the Philippines, G. Mennen Williams; Cornell Project Leader, J. F. Metz, Jr.; and G. F. Saguiguit, Director of Graduate Studies.*



*An active Cornell Club in Manila brings alumni together periodically from the capital city and Los Baños areas. Those standing are left to right: Arturo Tanco, who became Secretary of Agriculture and Natural Resources; M. C. Bond, visiting professor; Victor Buencamino; and K. L. Turk.*

that was constructed by renovating the rear part of the main lecture hall in the Chemistry Building. It was equipped for processing of soy and coconut milks and also could be used for sterilizing products in either glass or cans and was easily adaptable for studying the processing of fruits, particularly juices.

A process was developed, first in the laboratory and later in the pilot plant, for production of bottled, sterilized soy milk and soy-coconut milk with flavors acceptable to more than 90 per cent of the Filipino children used in surveys. Further research continued to provide improvements in the flavors and production methods for the soy and soy-coconut milks and eventually several commercial companies became interested in producing them according to formulas worked out at the U.P. College of Agriculture. Results of these studies and protein food research were extended to Taiwan, Korea, Thailand, India, Ceylon, Malaysia, and Indonesia, by Dr. Banzon and Professor Steinkraus through meetings and seminars held in these countries.

In cooperation with the National Nutrition Program, two processes were developed for the production of quick-cooking or instant-mungo bean flour. The use of fermentation as a means of separating coconut oil and protein was studied. One of the striking findings was that individual coconuts were widely variable in maturity, chemical composition, and reaction during fermentation. A detailed study of the microbiology of coconut meat was started by Professor W. Fernandez who was doing his doctoral research in microbiology under the direction of Professor Steinkraus. Salmonella have been rather serious contaminants in desiccated coconut and because of the public health significance it was hoped that Professor Fernandez's research would determine where they enter coconut and how they may be better controlled. Professor Fernandez was an UPCO participant and spent two years, 1966-1968, at Cornell taking courses in microbiology, biochemistry and food science. His thesis had not been completed at the termination of the program.

Two industrial research grants were awarded during the year 1968-1969 for work in Food Science and Technology. One of them from the Victorias Milling Company was to support studies on dextran production, and the second from the Philippine Packing Corporation was for studies on production of new products from pineapple juice with major emphasis on still wines and champagne-like beverages. In research at the UPCA a good quality still wine and an excellent quality sparkling wine were developed from pineapple juice which was currently produced in such large quantities in the Philippines that the excess is sometimes run into the ocean. The proper yeasts and conditions for fermentation have been determined and were made available to industries interested in commercializing the process.

In the course of his work, Professor Steinkraus served on the committees of three candidates for the Ph.D., five candidates for the M.S., and supervised undergraduate theses for four students. Cooperatively with Filipino staff members, he taught courses in advanced laboratory techniques, physiology of bacteria, industrial fermentations, and special topics and research problems. Professor Steinkraus continued to emphasize the need for an independent department with a chairman to coordinate and organize the total food science and technology effort on the UPCA campus. Further, he recommended that a strong section of microbiology be established within the new department when it was organized.

It should be recorded that much of the work on soybeans and soy milk was financed under a USAID/Cornell contract with part of the work being done at the New York State Agricultural Experiment Station at Geneva and part of it at Los Baños. Funds for the temporary plant and the equipment were provided by USAID. Funds from this source also paid the salaries for two pilot plant helpers, two food technologists, a secretary for the visiting professor, and all costs of operating the pilot plant. A significant proportion of this effort was used for teaching and research in the food technology program of the College. The overall objective of this USAID/Cornell contract was to develop highly acceptable protein foods from soybeans and other sources of vegetable protein.

After his arrival at Los Baños, Professor M. C. Bourne continued to conduct research for the improvement of the soy milk product. Eventually, a technique was developed in the pilot plant for producing a soy milk sterilized in bottles that had a shelf life of six months which appealed to approximately 85 per cent of Filipinos in field tests. Discussions continued with representatives of industry regarding the commercial production of this product. It appeared there was a good probability that a bottled sterilized soy milk would be placed on the market as a result of the research at the UPCA. Several companies also indicated an interest in using soy milk to replace skim-milk powder in some of their formulated food products. This would help to conserve the foreign exchange that was presently spent on imported skim-milk powder.

Professor Bourne served on committees of a large number of graduate students, two of them at the Ph.D. and nine at the M.S. level, and was the major advisor for six of the M.S. students. Their research was concerned with: (a) chemical, microbiological, and physical changes during the manufacture and ripening of mold-ripened soybean cheese; (b) bacteriological quality of Philippine refined sugars used in food processing; (c) the retention of ascorbic acid and sulphur dioxide in

sun-dried mango fruits; (d) drying and packaging of Philippine fish; and (e) quality factors of sun-dried papaya.

In cooperation with staff members in Animal Husbandry, Dr. Bourne was involved in a project on the use of carabao meat and goat meat in the manufacture of sausage products. Another project was concerned with quality factors in mango canned in syrup, cooperatively with staff members in Food Science, Home Technology, and Agronomy. The objective of this research was to develop a technique that would produce a higher-quality canned mango, and open up an opportunity to expanded commercial processors to develop a substantial export business in canned mango.

On the instructional side, Professor Bourne in cooperation with staff members of the UPCA, developed and taught two graduate courses, one in tropical food processing and the other in tropical fruit and vegetable processing. Lecture notes, laboratory exercises, and problem sets for both of these courses were mimeographed and left for future use of staff members in the instruction of these courses.

Improved interaction and working relationships with private industry resulted from discussions that were held between Professor Bourne and UPCA colleagues with management and technical people of some two dozen commercial food companies. Increased numbers of representatives from the food processing companies visited Los Baños expressly to consult with the Visiting Professor on specific problems. During the two-year assignment of Professor Bourne, more than three hundred visitors came to see and learn about the food science and technology program.

#### GRADUATE STUDENT PARTICIPANTS IN FOOD SCIENCE

One staff member, Mr. J. V. Melgar, from Food Science of the UPCA was sent to Cornell under the UPCO program to study for the M.S. degree. His problem dealt with the measurement of thermo-conductivity of meats.

Mr. Melgar assisted for one year in food science courses involving food processing. Also, he worked for several months in food science at Geneva, mainly in the pilot plant and in studies on soybean processing.

Another staff member from Los Baños, Mr. C. A. Capareda, spent several months at Geneva working in the pilot plant with the expectation that this experience and knowledge would be useful in the pilot plant operations at the UPCA.

The program in Food Science and Technology at Los Baños was further strengthened through the participation of a Cornell graduate student, Mr. A. J. Maurer. He served as a visiting instructor and member of the graduate faculty during his two year assignment. He taught for the first time a course on dehydration and freezing which was required

for all Food Science graduate students. Mr. Maurer presented lectures in several other courses in Food Science, Home Technology, and Animal Husbandry on the theory and application of freeze-drying and dehydration.

Mr. Maurer selected for his thesis research a study of factors affecting the drying, rehydration, and stability of freeze-dried foods. Since poultry meat was the primary commodity used for his research, his base of operations was in the Poultry Section of Animal Husbandry. This problem was chosen because long shelf life without refrigeration makes freeze-dried foods practical for areas of the world where refrigeration and freezing are not prevalent methods of food storage. However, storage and shelf life results of freeze-dried foods were not well known under humid, tropical conditions. Less expensive techniques for freeze-drying would also be welcome in any laboratory. Mr. Maurer's research provided much information on the texture, juiciness and flavor of freeze-dried rehydrated poultry meat.

As a result of Mr. Maurer's studies, freeze-drying as an analytical technique gathered considerable momentum on the UPCA campus. Many other research projects have included the use of the freeze-drying equipment for portions of their experiments, and a laboratory was established for the use of faculty and graduate students.

#### FOOD SCIENCE AND TECHNOLOGY ESTABLISHED AS A DEPARTMENT

During the final year of the UPCO program, a separate Department of Food Science and Technology at Los Baños became a reality. A new building had been completed under the five-year development program. Due to inflation and a number of other factors, it was necessary to reduce the size of the building and some of the equipment from the original plans. Nevertheless, infinitely better facilities, including a pilot plant, were now available for the teaching and research activities of the staff of this new department.

Dr. Julian Banzon, who had formerly been head of Chemistry, was named Chairman and several staff members were transferred from Chemistry to Food Science.

The objectives of this new Department are to provide a supply of well-trained people for service in the food industries and to develop a greater knowledge of characteristics of foods in order to aid the food industries of the Philippines. This would thereby improve the nutritional status of the people, create an enlarged market for agricultural products, and improve the balance of foreign trade. The opportunities for service to the food industries are great. Whether or not they will be met will depend upon the leadership of the personnel, the strength of the scientists in chemistry, microbiology and engineering and other related fields, and the support provided by the administration for a strong Food Science and Technology program.

## SOCIO-ECONOMICS AND COMMUNICATIONS

Social sciences and communications represent very significant and essential disciplines in the functions of the UPCA, embracing three major departments—Agricultural Economics, Agricultural Education, and Agricultural Communications (formerly Agricultural Information and Communications). The latter department had just been established when the UPCO program was initiated, but the others had functioned for many years.

An indication of growth and development of the staff of these departments during the past 10 years is shown in Tables 16 and 17.

As in other departments, the proportion of academic staff in 1963 with advanced levels of training was less than one-half of the total, in this case 37 per cent, but by 1973 the proportion had increased to 64 per cent. There were no full professors and only a few associate professors in 1963. While there has been some increase in the higher ranks, promotions have been slow. The need for further upgrading of the

TABLE 16. Distribution of Academic Staff by Rank in the Social Sciences and Communications, 1963 and 1973

	Agr. Economics		Agr. Education		Agr. Communications	
	1963	1973	1963	1973	1963	1973
Professor .....	-	2(1)*	-	3(1)*	-	1
Assoc. Professor .....	-	-	5(1)*	3(2)*	1	2(1)*
Ass't. Professor .....	5	9	5	14†	2(1)*	3(1)*
Instructor .....	8(2)*	9(3)*	21(3)*	15	7	8(2)*
Ass't. Instructor .....	7(1)*	2(1)*	4	-	2	-
Research Assistant .....	5	2	-	2	1	1
Total .....	25(3)*	24(5)*	35(4)*	37(3)*	13(1)*	15(4)*

\*Numbers in parentheses refer to staff on leave for advanced training or for other reasons.

†Includes two staff from the Office of Student Affairs.

TABLE 17. Distribution of Academic Staff in Social Sciences and Communications by Level of Training, 1963 and 1973

	Agr. Economics		Agr. Education		Agr. Communications	
	1963	1973	1963	1973	1963	1973
Ph.D. ....	5	9	5	13*	2	5
M.S./M.A. ....	2	7	10	12	3	3
B.S./A.B. only .....	18	8	20	12	8	7
Total .....	25	24	35	37	13	15

\*Includes two staff from the Office of Student Affairs.

quality of the faculty in these departments is clearly evident by the fact that 36 per cent of the staff have no training higher than the B.S. degree.

#### AGRICULTURAL ECONOMICS

During the Interim Period and prior to the initiation of the UPCO program, the Department of Agricultural Economics had been getting very high quality assistance for a couple of years in its teaching and research programs from Dr. V. W. Ruttan, Agricultural Economist, of IRRI. Substantial progress had been made in developing an M.S. program, but the departmental staff agreed they did not have sufficient depth to offer graduate studies at the Ph.D. level.

The first visiting professor from Cornell, Dr. Randolph Barker, arrived at Los Baños in September 1965. At the time of his arrival there were five full-time senior staff members (i.e. those with Ph.D.'s) working in Agricultural Economics, including Dr. Barker and Dr. S. C. Hsieh, the first Asian visiting professor under the UPCO program. Backing up this senior staff was a group of competent personnel at the instructor level who either held Master's Degrees or were close to finishing Master's Degree programs. There were three Ph.D. candidates studying in the United States.

Dr. Hsieh had been awarded a leave of absence from his post as Secretary-General of the Joint Commission on Rural Reconstruction (JCRR) in Taiwan. He introduced new and helpful courses and effective research in Agricultural Economics, and consulted widely with rural banks, Philippine government bureaus, and with personnel of the Agency for International Development. His work won wide recognition and he played an important role in the preparation of a cooperative program that was submitted to AID's Mission Director, Dr. Wesley Haraldson. At the end of the year, Dr. Hsieh resigned his post from the JCRR in order to extend his work as an Asian visiting professor at Los Baños.

When Dr. S. C. Hsieh joined the UPCO Program as visiting professor, he was given the privilege of bringing with him two graduate students of his choice to pursue advance studies at UPCA. Under this program, Mr. Charles Lu and Mr. David Liao were selected.

Mr. Lu completed his Ph.D. program in 1968 in the field of Extension Education and his doctoral dissertation covered a field study and evaluation of farm-level implementation of national agricultural development programs in the Philippines. Dr. Lu is now Associate Professor of Agricultural Extension of the National Taiwan University and was elected Legislator of the Legislative Yuan in the Government of the Republic of China in Taiwan (which is the equivalent of a Member of the House of Representatives in the United States).

Mr. Liao completed his Master's Degree in Agricultural Economics in UPCA in 1967 and continued his Research Assistantship in IRRI for two years under the guidance of Dr. Randolph Barker. Then he received a scholarship to pursue his Ph.D. at Oregon State University and he completed his doctorate degree in 1973. He is now doing research work at the Department of Agricultural Economics of the Oregon State University.

After two years at Los Baños, Dr. Hsieh left the College to take a position with the Asian Development Bank that was being established in Manila. Some of the senior Filipino staff also had left Agricultural Economics to assume other positions in the Philippines. This left a shortage of staff members which coincided with an increasing demand on the resources of the Department as the College became more actively involved in the agricultural development of the Philippines.

Dr. Randolph Barker gave first priority to the training of students, both undergraduate and graduate. The Master's Degree curriculum was described by Professor Barker as the best in Agricultural Economics in Southeast Asia. He felt the program was better suited to the needs of Filipino students than many of the Masters' Programs in universities in the United States and at the same time prepared students well for further graduate training. This strong graduate training program in Agricultural Economics was made possible by combining resources in the Department with complementary competencies outside of the department. For example, the courses in micro- and macro-economics continued to be taken by the graduate students at Diliman. Students benefited from this association with an excellent staff at the UP School of Economics. Courses in statistics were offered through the staff in Applied Mathematics, and two of the graduate courses were offered by the statistician at IRRI.

During the second year of his assignment, Professor Barker cooperated with the IRRI in their program of research in Agricultural Economics. In July 1967, toward the end of his second year, Professor Barker joined the staff at IRRI and has continued since that time to work closely with the staff in Agricultural Economics in the UPCA. He teaches one course each semester and serves on graduate student committees. At the time he left his formal affiliation with the College, Professor Barker indicated there was need for research in extension to be more deeply integrated, and the research-extension effort needs to be more directly problem-oriented in Agricultural Economics. He felt that too much emphasis was being placed on rice at the expense of other crops since twelve out of sixteen projects dealt with the economics of rice. Further, he recommended that there should be an annual review of research in Agricultural Economics as well as in the other major departments.

The appointment of Vice-President D. L. Umali as Undersecretary of Agriculture in the Department of Agriculture and Natural Resources (DANR) brought both a burden and challenge to the Department of Agricultural Economics. Several staff members, including the visiting professors, were called upon to provide advisory services to the DANR in addition to their regular responsibilities of teaching and research. This resulted in a widening of functions and responsibilities of professors in the Department at a time when personnel were becoming more limited.

#### *Cornell Graduate Student Participants*

A Cornell graduate student, Mr. A. J. Nyberg, went to Los Baños for his thesis research and overlapped with Professor Barker for almost two years. Mr. Nyberg assisted with instruction in some of the courses in Agricultural Economics and he attended two others, one in agricultural development and the other in planned tenure systems. For his thesis research, Mr. Nyberg made an intensive study of the Philippine coconut industry. The study was undertaken to determine the status of the industry and to identify problem sectors in which guidelines for improved economic efficiency might be established.

In these studies it was found that certain internal inefficiencies exist in the domestic market structure. The copra price margin between the average farm and average port price is twice as great as the margin between Philippine ports and United States or European ports. The high cost of transportation coupled with what is probably an excessive number of marketing firms contributes materially to the large margin.

The marketing system has also failed to provide incentives for the manufacture of superior quality copra. The magnitude of production by individual small holders is inadequate to maintain economically high-quality standards. Consideration should be given to the establishment of copra manufacturing stations where quality control could be exercised and size economy might exist.

The influence of increased copra supply is an important question for the Philippines. The shift in new plantings and production to more productive regions of Mindanao, and to large, well-managed plantations, suggests that supply can and will be increased substantially in the near future. For the immediate future, however, small holders will supply the bulk of the copra. The use of adapted intercrops may supplement income by utilizing land more efficiently. For a long-term perspective, research is required to increase the coconut's genetic production capacity.

After departure from the Philippines, Mr. Nyberg spent two weeks in Ceylon, Malaysia, and Indonesia to determine the state of coconut production and marketing in these production centers. Data suitable

for deriving production response functions were obtained from the Coconut Research Institute in Ceylon. Brief visits were made to the major vegetable oil consumption centers at Amsterdam, London, and New York to obtain information relative to the demand for coconut products. These data were used to derive demand functions.

About a year after Mr. Nyberg left the Philippines, another Cornell graduate student, Mr. Charles A. Robertson, started his thesis research on the economics of pump irrigation in Central Luzon. This study fitted in well with the research described earlier by Professor Levine and his graduate students. Mr. Robertson's objectives were to: (1) estimate the rate of return to capital invested in ground water irrigation facilities, (2) account for the factors causing variation in returns and measure their effects, and (3) provide guidelines concerning the future development of ground water irrigation. He found that capital invested in pump irrigation earns a high rate of return. On the average, earnings were such that capital costs could be recovered within a few years. The return to unpaid family labor engaged in pump irrigated farming is above the current minimum wage level. The area serviced by ground water irrigation facilities is considerably less than that conventionally attributed to pumps of the capacity being used. Yields achieved on pump irrigated land were well below the levels associated with adequate input and good management.

A proposal was developed by the staff in Agricultural Economics to use Mr. Robertson's results and research framework as a basis for continuing research into the economics of pump irrigation. It was suggested that the findings be tested on a regional basis. In addition to his research, Mr. Robertson made significant contributions to Agricultural Economics through his teaching of an introductory course in Statistics.

### *New Emphasis to Marketing*

When Dr. L. B. Darrah was in the Philippines in 1957-1958 as a member of the first Cornell-Los Baños program, he prepared a mimeographed text on agricultural marketing in the Philippines. This was used effectively by staff members in the department, but it needed to be revised and updated. As a result, the services of Professor Darrah were requested for a period of about six months beginning in June, 1968, to revise this textbook. He was assisted in this project by his Philippine colleague, Dr. Fabian Tiongson. By working primarily on this and putting in very long hours, with the assistance of Mrs. Darrah, Professor Darrah was able to complete this task and the first copies of the printed book entitled *Agricultural Marketing in the Philippines* came off the press early in December. In the revision, current data from various sources in the Philippines were used and the book has fulfilled

a very important need for Philippine students studying agricultural marketing.

Professor and Mrs. Darrah returned to Los Baños in July, 1970, to serve as a visiting professor during the terminal two years of the UPCO program. In assuming this role, Professor Darrah felt that the typical visiting professor's role had changed rather dramatically. No longer was the chief emphasis placed on graduate teaching and training *per se*, but a shift was made to (1) the identification of major marketing problems faced by the Philippine government's food and agriculture program, and (2) development of a research program relevant to these problems. In this way, the research aspects of the Graduate Education Program were specifically designed to contribute directly to the national agricultural development program.

This type of program meant involvement. As a result, the visiting professor and his colleagues were frequently called upon to participate in and provide advisory and consulting services to the government's overall program in agriculture. Meetings and conferences, ranging from short-term ad hoc committees, to long-range program committees, to conferences with members of the presidential economic staff were numerous. This brought Professor Darrah and his colleagues into close contact with many government officials and representatives of private industry and enhanced the development of close working relationships. More important was the fact that many became aware of the contribution that agricultural economists of the UPCA could make to the various governmental programs.

It is significant that there was not more than one or two persons involved in marketing and business management work at the College in July, 1970, and little, if any, relationship existed with the various national agricultural programs. During the next two years a significant amount of staff development occurred. Eleven staff members and graduate students became involved in marketing research projects relative to the national agricultural program. They served responsibly in planning the research studies, conducting the essential field work, analyzing the data, preparing research reports, and participating in various national committee discussions. Although the marketing and business management personnel were young, they matured rapidly in research procedures and became tremendously excited about conducting research relevant to their country's agricultural policies and programs and participating in action programs.

The research program included 11 major studies which resulted in the publication of more than 20 staff papers. Some of the research papers were used as a partial basis for an application for a livestock production and marketing loan from the World Bank. Another led to the creation of an ad hoc committee to draft enabling legislation for the

establishment of marketing boards in the Philippines. Others led a private operator to develop plans for a livestock processing plant in General Santos City, and private investors were investigating the desirability of constructing processing plants in other areas. A research report on some legal and economic aspects of livestock marketing led to the establishment of a committee on regulations and controls, of which Dr. Darrah was a member. This committee proposed the establishment of a National Meat Hygiene and Livestock Marketing Board to integrate the various regulations involved in livestock and meat marketing and to develop a national meat hygiene system.

It is worthwhile recognizing that of these 11 studies, six were partly financed by a grant from the NSDB; one from a grant by the National Research Council (NRC) of the Philippines; three were financed, in part, by the Ford Foundation; and two were financed by UPCO funds.

An indication of Dr. Darrah's national involvement is given by the fact that he was asked to serve on some 16 different national committees established by the Secretary of the DANR or by the National Food and Agriculture Council (NFAC). In addition to the formal committees, he was requested to serve as an advisor to the Philippine Hog Raisers' Association and the Poultry Producers' Marketing Corporation. With his very active program, it was not surprising that Dr. Darrah was called upon frequently to present seminars, discuss special topics at meetings, and to present lectures on marketing and marketing research to various groups. The list of seminars, talks, and lectures totaled more than 30 during his period of service.

Due to the relatively large research program and the numerous committee meetings in which Dr. Darrah was involved, his teaching program was somewhat restricted. He developed the lectures for the basic marketing course at the UPCA and gave most of them himself, but was assisted by one of the staff members, E. D. Dosayla.

Recognition also should be given to Mrs. L. B. Darrah for contributions she made to the library in Agricultural Economics. She was requested by the staff to develop a classification system for the Department's reading room. By using the facilities of the libraries of the UPCA at Diliman and IRRI, and by spending many long hours at these tasks, Mrs. Darrah established a modified Library of Congress system with appropriate title, subject and author cards. A card file case, bookends, and holding boxes were acquired and the reading room was converted into a mini-library of substantial value to the staff and students.

#### *UPCA Graduate Student Participants*

As a part of the staff development program in Agricultural Economics, Miss Purificacion Oña was selected as a Ph.D. candidate under the UPCO program. She was accepted by the Graduate School

of Pennsylvania State University and started her work there in March, 1967. It was expected that she would do her course work at Penn State and then return to the Philippines to collect her thesis data under the same type of arrangement that was already in effect. Miss Oña completed her course work at the Pennsylvania State University and made plans for her thesis research back in the Philippines to be conducted under the direction of Dr. Randolph Barker. Just as she was ready to return to the Philippines, she decided to marry an American, and at the time this report is written, she has not completed her program of graduate study. There is no evidence that she will return to the Philippines.

One of the promising young staff members in agricultural marketing, Mr. E. D. Dosayla, was sent to Cornell in the summer of 1969 to begin an M.S. program under the supervision of Dr. L. B. Darrah. Since Dr. Darrah was going to the Philippines on a two-year assignment on July 1, 1970, it was decided that Mr. Dosayla would return to Los Baños after he had completed a year of study at Cornell and complete his thesis research in the Philippines. He has been an active and productive member of the marketing research team, as well as in teaching at Los Baños, since that time.

Another member of the agricultural marketing group at the UPCA, Mr. Narciso Deomampo, was sent to Cornell for one year of course work under the UPCA Ph.D. program. He returned to the Philippines and successfully completed the requirements for the Ph.D. from the University of the Philippines in 1973.

#### *Comment on Staff Development*

In the early years of the UPCO program, the quality of the staff in its educational and research programs in Agricultural Economics was easily among the best of the several departments at Los Baños. When several of the senior staff were attracted to other positions in the government, in the University, and to other countries, this resulted in a young staff with only one or two of the senior professors left, and most of them without advanced training. The rebuilding process had to be started all over again, but after several years and the return of staff members from advanced training in the United States, the quality of the staff was improving rapidly in 1971-1972.

In his terminal report, Dr. Darrah stated that:

“The department has a young, well-qualified group of senior staff members. And as others return from study abroad, or complete advanced degrees locally, the capability of the staff will further improve and the dependence of governmental agencies upon the staff for advice and assistance will be more intense. This is good. But to keep the department strong, efforts must be exerted to provide such financial and promotional incentives as are necessary to keep the staff

members in the department. Otherwise, their movement to more financially rewarding opportunities will again develop as in previous years, and the department and College will once again have to rebuild a staff of agricultural economists.

"The need is surely recognized. It can only be hoped that the essential funds will be forthcoming to keep the staff intact. It should be more economical to keep capable people than to have the department serve as a training area for other firms and agencies and continually have to find ways to provide for the training of the relatively large number of new people."

## AGRICULTURAL EDUCATION AND RURAL SOCIOLOGY

With a relatively large number of senior staff with Ph.D. level training in the professorial grades, graduate studies were fairly well advanced in Agricultural Education at the beginning of the UPCO program. As a result, a low priority was assigned to the utilization of visiting professors from Cornell.

### *Visiting Asian Professor*

Arrangements were made by the administration of the UPCA to obtain the services of Dean C. W. Chang to serve as a visiting professor and scholar in Agricultural Education. A distinguished educator in China and Taiwan, Dean Chang was extremely knowledgeable on agricultural and rural development. He assisted in the development of an advanced course in Agricultural Education after joining the UPCO staff in August, 1966. However, most of his time was devoted to the preparation of a book, *Rural Asia Marches Forward*, which was published in the College textbook series. The book has served as a teaching manual and source book for use in training courses for agricultural and rural development workers. Part I of the book presents a review of the Asian region as a whole, covering agricultural education, research, extension, and rural development. Part II deals mainly with case studies selected on the basis that they had been in operation for some time and already had produced results that the author had observed. They are grouped together under several categories: (1) training for a richer rural life; (2) living in better homes; (3) making the land more productive; (4) development of more aggressive communities; and (5) utilizing international assistance.

With the development of the Southeast Asian Ministers of Education Organization (SEAMEO) and its regional program for research and graduate education in Southeast Asia (SEARCA), the Asian visiting professor phase of the UPCO program and that for the Asian graduate students were absorbed by SEARCA.

*Cornell Graduate Students at Los Baños*

Five Cornell graduate students, four from Rural Sociology and one from Extension Education, participated in the UPCO program, serving as instructors in the Department of Agricultural Education, and carried out their Ph.D. thesis research in the Philippines. These five Ph.D. candidates covered the span of much of the program beginning in July, 1964 through August, 1971.

The first of these graduate students in rural sociology was Isao Fujimoto. During his stay of almost two years in the Philippines, he assisted or taught three courses, two of them primarily at the graduate level. He worked with seven graduate students who were developing their research for Master's degrees in community development, agricultural education, or agricultural extension. Six of these graduate students had been in the research methods course that he had taught a year earlier. In addition, Mr. Fujimoto gave a series of lectures to different training groups at the Community Development Center.

Mr. Fujimoto in his research made an attempt to answer two questions: (1) How do communities develop?, and assuming an answer to the first question, (2) Can we then tell for what are communities ready? These questions were addressed to theoretical problems of modernization as well as to concerns with action programs in development, particularly at the community level.

Four papers were prepared or published while Mr. Fujimoto was in the Philippines. After returning to Cornell for almost a year, he left to assume a position at the University of California at Davis before the completion of his thesis and final examination. Unfortunately, these responsibilities have not been met at the termination of the UPCO program.

Mr. Douglas R. Pickett, whose major interest was in Extension Education, went to Los Baños in February, 1966 for eighteen months. Most of his time was spent in developing and implementing his thesis research project which dealt with some of the factors which modify the utility of in-service training programs for extension workers. In the two previous years, the in-service training of extension workers of several kinds had become a major concern of the UPCA. It was felt, therefore, that this research problem could add practical significance, both for the College and for the governmental and private agencies which were sending their personnel to the College for training.

Mr. Pickett did not teach or assist in the teaching of courses. This made his experience quite different from all of the other Cornell graduate assistants in the UPCO program, and may have been due to a lack of adequate communications. It is regrettable that Mr. Pickett has not completed his thesis and final examination after returning to Cornell.

The next three graduate students all were majors in Rural Sociology. Staff members at Los Baños in Rural Sociology are a part of the Department of Rural Education, although there are neither undergraduate nor graduate majors in sociology. Professor Gelia Castillo, a distinguished rural sociologist on the UPCA staff, served as counselor and advisor to all of them. In the case of Mr. Donald E. Voth, Professor Castillo had served as one of his advisors at Cornell during the fall term of 1966-1967 and, as such, participated in his comprehensive examination, as well as in the development of his research project. After her return to Los Baños in the summer of 1967, she served as Mr. Voth's advisor throughout his period of 17 months in the Philippines which terminated in August, 1968.

Most of Mr. Voth's time in the Philippines was spent on his research for the Ph.D. dissertation entitled, "Social Mobility in the Dumaguete City Trade Area: A Longitudinal Study." This research was a follow-up of a 1952 study which had been made by Professor R. A. Polson of Rural Sociology at Cornell and Professor A. P. Pal of Silliman University. Mr. Voth's study assessed the prevalence of migration and social mobility, and described major characteristics of the mobile and migratory, as well as of the stationary and nonmigratory, populations previously studied by Professors Polson and Pal in 1952. Mr. Voth was fortunate in obtaining the close and excellent cooperation of Professor Agaton Pal at Silliman University in carrying out his project.

Mr. Voth also assisted in the teaching of one of the courses in Rural Sociology at Los Baños.

Two other activities are worthy of mention relating to Mr. Voth's assignment in the Philippines: (1) He participated in a conference in Hong Kong sponsored by the London-Cornell Project in Asian Studies for professors and graduate students doing field research in Asia; and (2) He spent a month reviewing Vietnam Christian Service projects among the highland minorities of the central islands of South Vietnam.

The next graduate student participant from Rural Sociology at Cornell was Mr. Gerald C. Wheelock who was at Los Baños during the two-year period beginning in September, 1968. He chose for his thesis study the topic, "Municipal Structure and Institution Building: The Palay Farmers' Cooperative Marketing Association." In addition to good cooperation from some of his colleagues in the Department of Agricultural Education, Mr. Wheelock obtained assistance from representatives from many Philippine organizations.

The principal objective of one phase of Mr. Wheelock's research was to make an analysis of the status of the municipal-level farmers' organization, The Palay Farmers' Cooperative Marketing Association (FACOMA), in terms of its infrastructural and institutional structural context. A second phase involved a field survey of some 70 municipal

offices and the respective FACOMA in ten Luzon provinces covering 457 municipalities. Two cooperative development paths were being followed by the FACOMA, those specializing in *palay* and those fostering crop diversification. Mr. Wheelock's studies indicated these two policy paths need not be independent of one another. Policy-makers must be in close touch with relevant conditions of the municipal level, and they must have the farmers' interests well in mind before passing judgment on the broad policy handed down. If the cooperative policy-makers are not able to look closer at the municipality and become more intimately familiar with it, then they need to write policies which foster vertical integration of the leaseholder through his FACOMA into the modernizing economy. Additionally, policies will have to permit more flexibility at the local level, e.g., through cooperative banking and by providing short-term protection in the *palay* market. Thus, FACOMA membership and management will have more freedom to design the FACOMA which, after all, in a cooperative society, must be their organization.

Mr. Wheelock assisted in teaching two graduate-level courses. He also developed a teaching aid for the use of Guttman scale-o-gram analysis, a technique of increasing importance in the macro-structural study of community growth.

The last of the rural sociology graduate assistants was Mr. Bruce M. Koppel who was in the Philippines during the final two years of the UPCO program. He studied the interrelationships between social structure and belief systems as they relate to the conditions of social participation in the rural Philippines. These studies were made in the Potocan-Passi area of Iloilo Province 1950-1970. Among a number of findings from his research, Mr. Koppel concluded that:

"The pattern of local land title alienation and its linkages to the political economy of the region is the most significant agricultural change in the last twenty years, not the more visible spread of high-yielding rice varieties and the expanded land in sugar cane. . . .

"The system supportive functions of low-risk impact approaches by the public sector has contributed considerably to development without modernization—the elaboration of existing political, economic, and social stratification criteria. New cleavages are the result of factors generated from within and limited by the existing stratification systems and are not externally derived. The basic terms of intersector articulation remain unchanged."

As a part of his assignment at Los Baños, Mr. Koppel taught two graduate-level courses, one in social psychology and the other on principles of administration and supervision. In both cases, Mr. Koppel's teaching activities were in collaboration with Filipino associates. In connection with his research program, Mr. Koppel was in full-time

residence at Central Philippine University in Iloilo City during the first semester of 1970-1971. While at this university he taught two courses taken by seniors and graduate students, oriental government and politics and logic of survey research. Mr. Koppel was a member of the Center for Regional Development Studies in Iloilo and assisted with some of its program activities. Also, he assisted with the cross-cultural sensitivity training of a group of Peace Corps Volunteers.

#### *Cornell Visiting Professors in Rural Education*

Priorities were not given to visiting professors in rural sociology by the UPCA faculty and administration even though the need for expansion of the social sciences was emphasized on frequent occasions. Through the cooperation of the Agricultural Development Council, however, the services of Dr. A. M. Weisblat as a visiting professor and scholar were provided for several years, and he made many contributions to the development of the rural social sciences.

Toward the end of the UPCO program, a request was made to Cornell to provide visiting professors in Agricultural Education. Accordingly, Professor Frederick K. T. Tom and his family were at Los Baños for eighteen months beginning in July, 1967, and Professor H. R. Cushman and family were there for two years beginning in August, 1968.

During his assignment, Professor Tom was invited to spend about 75 per cent of his time with the Department of Agricultural Education and 25 per cent in the Office of the Director of Extension Education. Although there are many ways in which one could contribute, Professor Tom relied chiefly on the technique of collaborating with his colleagues on helping with problems of concern to them. He felt that through such collaboration, not only would he himself be benefited, but his colleagues would be encouraged to do better work, would retain, rekindle, or increase their professional enthusiasm, would attack their daily tasks with increased vigor, would look to the future with brighter optimism and, hopefully, would gain greater skills needed in the discharge of their research, teaching, and extension functions. In accomplishing these objectives, Professor Tom taught the graduate course on educational theories and principles, and served on numerous committees in the department and in the College. He collaborated in summarizing an ACAP project, studies in agricultural education, and helped to make an analysis of the Agricultural Education course offerings and teaching loads of faculty members at the UPCA during the preceding three years. Professor Tom was involved with his colleagues in planning for the successful completion of a large study which had been set up several years earlier on alternative approaches to extension education.

Along with two senior members of the staff, Dr. Martin V. Jarmin and Dr. Severino R. Santos, Professor Tom made a study tour to Thailand, Malaysia, Indonesia, Taiwan and Japan to review agricultural education in each of these countries and to observe progress being made as well as to discuss professional problems of mutual concern. Also, Professor Tom accompanied Mrs. Perla T. Umali, farm and home development training supervisor, on an 18-day extension study tour of East Pakistan and Thailand. Since many students from these countries study at the UPCA, one of the anticipated outcomes of such a study tour was that training programs designed at the College would reflect more accurately the actual conditions and problems faced by these students.

Having served for eighteen months with the Cornell-Los Baños Contract team approximately ten years previously, Professor H. R. Cushman was amazed upon his arrival in August, 1968, to observe the rate of acceleration characterizing the development of the Department of Agricultural Education. Notable advances had been made in the undergraduate and graduate education programs as well as expansion in research and extension. The department was in a position of leadership within the region and several of the staff members were earning wide acclaim on the international scene. During the year 1969-1970, there were 14 graduate students in the department from five different countries.

Professor Cushman spent a great deal of his time collaborating with colleagues on the effective presentation of agricultural research findings for use by students in the agricultural high schools. Previous research had shown that student learning is improved when they have ready access to up-to-date instructional materials which are based on research findings, written at appropriate difficulty and interest levels, presented from the farmers' point of view, appropriately illustrated, and characterized by correct language usage. With the goal of making such materials readily available to agricultural high school students, the Department of Agricultural Education undertook a cooperative project with the Bureau of Vocational Education focused on the achievement of four purposes:

- 1) To determine the reading level of students in the national agricultural schools;
- 2) To ascertain the agricultural enterprise areas in which student manuals were most needed;
- 3) To obtain suggestions for improving the agricultural enterprise manuals previously developed and distributed by the College of Agriculture in 1960; and
- 4) To revise and publish such reference materials for use by agricultural students.

In the assessment of the reading ability of agricultural students, it was found that students in the national agricultural schools read, on the average, on a level between grades 6 and 7. Persons preparing written materials in English for farmers should therefore set a top reading limit of grade 6 or 7.

Ten agricultural enterprise manuals, e.g. Rice Production in the Philippines, were revised, published, and distributed to the 75 national agriculture schools throughout the country.

Professor Cushman also worked in close collaboration with Professors Barile and Santos to edit a textbook entitled *Teaching Vocational Agriculture in the Philippines*. Intended for use in undergraduate and graduate in-service training courses offered by the several institutions training high school teachers of agriculture, the book deals with methods and materials of teaching which have proven effective in the agricultural schools of the Philippines. The book was published by the college textbook board in 1973.

During the fall of 1969 Professor Cushman and two Filipino counterparts, Professors Barile and Gagni, made a month-long tour to observe agricultural programs in Thailand, Taiwan, South Korea, and Japan. The innovations observed were described in a publication entitled *Innovative Agricultural Education Programs in Southeast Asia*.

A new graduate level course entitled "Teacher Education in Agriculture" was planned and taught as a shared venture by Professors Cushman and Santos during the spring term of 1970.

Professor Cushman also made numerous seminar presentations on the subject of "Improving College Teaching" during his tenure at the College.

#### *Staff Development*

Several staff members of the Department of Agricultural Education were sent abroad for advanced training at the doctorate level under the fellowship phase of the UPCO program. Only one was sent to Cornell under the assistantship phase and plan whereby he would return to the Philippines for his thesis research. This was Mr. Clemente P. Juliano, Jr., who had been actively engaged for a number of years in the farm and home development and extension education programs at the UPCA. His major at Cornell was in Extension Education with minors in Rural Sociology and Public Administration. After spending two and one-half years taking graduate-level courses in these areas, Mr. Juliano returned to the Philippines in January, 1970, to initiate his doctoral dissertation under the title, "Some Selected Factors Related to Empathic Ability of Farm Management Technicians in the Philippines."

The focus of Mr. Juliano's study was the approximately 2,100 farm management technicians working as extension agents under the Ag-

ricultural Productivity Commission. Among a large number of conclusions and implications, Mr. Juliano stated:

"As evidenced by this study, empathic ability, with the use of an adopted scale, is a valid and reliable index of the extent to which the farm management technician may succeed in his work because of its relationships to a host of biographic and job-related factors, job values, role items, job involvement and training need items relevant to extension work. Farm management technicians who are high in empathic ability perform with a high degree of involvement in their respective jobs. Since empathic ability is present to some degree in most persons, farm management technicians, high in empathic ability, are more likely to succeed in working with and through members of their clientele who are also high in empathic ability."

#### AGRICULTURAL COMMUNICATIONS

The Office of Extension and Publications had been created in the College of Agriculture several years earlier (1954) and substantial progress in staff and activities was evident when the five-year development program was being planned and implemented. At about the time the UPCO program was initiated, the office was upgraded to the Department of Agricultural Information and Communications. Professor W. B. Ward, head of the Department of Communication Arts at Cornell, had helped in the development of the Office of Extension and Publications in 1956-1957. It was very logical, therefore, for him to return in the summer of 1965 as an UPCO consultant to review the activities of the new department.

Professor Ward found much progress had been made since his last assignment at Los Baños, but he also found several problems. For example, by this time the Department had grown to 40 full-time persons and had become somewhat out of balance during the three years of the department's development. Some phases were over-emphasized and supported in relation to total responsibilities while others were neglected. It was clear to Professor Ward that the writing functions of the department, which should have been the strongest, were obviously the weakest. It was his feeling that no department of information can be stronger than its writing division, because from it comes the basic material used in almost all areas of mass communications. As the Department had increased the numbers of its staff with advanced degrees, a feeling had grown among the Filipino staff that it should be primarily a teaching and research department and leave the information and public relations functions to others.

During his assignment of three months, Professor Ward, working with all of the staff members of the department, made twelve major recommendations, some of which were implemented before he left

Los Baños. Space here will permit mentioning only one or two of the major suggested priorities for attention. For example, it was recommended that a writing pool be created for press, radio, and publications. Second, the Department should establish, in close cooperation with the Dean, the public relations function as an integral part of the total department activities. It was suggested that the number of section heads be reduced from six to two—an information division and a teaching-research division.

One of the outstanding direct achievements of the consultation period of Professor Ward was the publication of a brochure entitled "Los Baños Today and Tomorrow." This represented the diligent endeavors and ideas of many individuals. The brochure has continued since that time to be a most useful tool in presenting the multiple activities to be found among the several institutes and colleges which form the Los Baños complex.

Shortly after Professor Ward arrived at Los Baños on his consulting assignment, the head of the department, Dr. Thomas G. Flores, left on an assignment of one year at Cornell to become the first Filipino visiting professor under the UPCO program. While at Cornell, Professor Flores prepared a syllabus and during the second semester taught a course in international communication. Also, he prepared a ten-year development program in international communication that hopefully would be useful to the faculty of communication arts at Cornell for strengthening courses in this area.

### PLANT AND ANIMAL PROTECTION

Plant and animal protection have always played a dominant role in agricultural production and become increasingly important as the pressure for food increases. It has been estimated that the efforts of at least one farmer out of every seven involved in food production go toward feeding insects and related pests of crops and livestock. It is probable that plant diseases cause losses of between 20-30 per cent to agriculture. Rice blast alone has been estimated to cause 20 per cent reduction in rice yields in the Philippines.

The problems are many and difficult, increasingly so in the hot, humid tropics, for entomologists and plant pathologists to solve. To solve them requires the interest, efforts, support and teamwork of scientists in several other disciplines, especially those in genetics and the crop sciences.

Even though substantial contributions have been made in the past in plant and animal protection, the Department of Entomology and Zoology and the Department of Plant Pathology will have to play continuing and leading roles in the future in protecting crops and in increasing food production.

Strengths and weaknesses in the staffs in the Departments of Entomology and Plant Pathology are shown in Tables 18 and 19.

TABLE 18. Distribution of Academic Staff by Rank for the Departments in Plant and Animal Protection, 1963 and 1973

	Entomology and Zoology		Plant Pathology	
	1963	1973	1963	1973
Professor .....	1	1(1)*	-	1
Associate Professor .....	-	2	-	1
Assistant Professor .....	2	10(1)*	4	14(1)*
Instructor .....	12(2)*	8(5)*	12(3)*	3(2)*
Assistant Instructor .....	5(1)*	-	-	1
Research Assistant .....	3	-	4	4
Total .....	23(3)*	21(7)*	20(3)*	24(3)*

\*Number in parentheses refers to number of staff on leave for advanced training or for other reasons.

TABLE 19. Distribution of Academic Staff by Level of Training for the Departments in Plant and Animal Protection, 1963 and 1973

	Entomology and Zoology		Plant Pathology	
	1963	1973	1963	1973
Ph.D. ....	2	11	3	13
M.S./M.A. ....	7	8	6	6
B.S./A.B. only .....	14	2	11	5
Total .....	23	21	20	24

In 1963 more than one-half of the academic staff listed had only the B.S. degree-level of training. There was only one full professor (who had recently retired), no associate professors, and only five assistant professors in the two departments. Six staff members were on leave abroad for advanced training. It is obvious that to be embarking on expanded graduate education programs in both of these departments was rather difficult at that time when so few staff members were qualified to offer graduate-level courses.

With 53 per cent of the staff in the two departments holding Ph.D.'s in 1973, compared with 12 per cent in 1963, it is clear that substantial improvement in staff development has taken place. There has been a marked increase in staff at the assistant professor rank, but few have been promoted to associate or full professor.

## ENTOMOLOGY AND ZOOLOGY

*Short-Term Visiting Professors*

A medical entomologist, Professor B. V. Travis, served as a short-term visiting professor in Animal Sciences for three months early in 1964, and reviewed programs in Entomology. He noted that Entomology had been offering a fairly strong M.S. training program. The primary deficiencies were in the basic courses in Zoology. The number of staff members assigned to research actually had declined since 1959 when Professor Travis had served in the Philippines on the earlier project. Professor Travis pointed out the tremendous need for more research on the species, basic biologies, and economic significance of the crop pests, both vertebrate and invertebrate. There was also pressing need to determine the potential health dangers from pesticide residues, to solve the problems related to huge rat populations, and to study the biology, identification and control of soil inhabiting nematodes.

Late in the summer of 1967, Vice-President Umali established a College-wide committee to assess the status of the College's programs in plant and animal protection, especially as conducted by staff members in Entomology and Zoology and Plant Pathology, and to evaluate the projected plans for future growth of these two departments. Professor David Pimentel, who at that time was chairman of the Department of Entomology at Cornell, was invited to serve a three-months' assignment as consultant to this Committee.

The committee suggested that both departments should increase their professorial staffs about four times to be fully effective. The number of graduate assistants should be increased and largely ought to replace the assistant instructors and instructors. The course offerings in both departments were exceptionally broad and there was little need for any expansion. The basic need in both departments, as judged by this committee, was for applied field research. As a result, the committee recommended that applied research receive the highest priority in the future staffing of the departments and, this, in turn, would materially strengthen the instruction, research, and extension programs in plant and animal protection throughout the College.

There was some concern over the fact that work in nematology was developing in both Entomology and Plant Pathology. There was general agreement that responsibility for developing this area of work should reside in one department. There was also agreement that the specialties of food microbiology, industrial microbiology, and industrial mycology, which were in the Department of Plant Pathology, might ultimately transfer to the College's new program in Food Technology.

Dr. Roger A. Morse, Associate Professor of Apiculture at Cornell, spent six months in the Philippines in 1968 conducting research on the

Asian bee, *Apis dorsata*. His work was financed by a grant from the National Science Foundation and was carried out in close collaboration with Dr. F. M. Laigo and others in the UPCA. Although not officially an UPCA participant, Dr. Morse and his family were provided with the use of an automobile and housing in the UPCA barrio. In exchange for these, Dr. Morse taught a two-credit course in elementary beekeeping and investigated problems associated with the introduction of the European honey bee, *Apis mellifera*, into the Philippines. Five publications came out of Dr. Morse's research, all joint with Filipino staff, and much interest was created in bees and beekeeping and a foundation was laid for future research.

### *Visiting Professors in Entomology and Zoology*

Two Cornell professors, Dr. L. D. Uhler, biologist at Ithaca, and Dr. E. H. Glass, head of the Department of Entomology at Geneva, were invited to spend their sabbaticals of one year at Los Baños in the Department of Entomology and Zoology. In both cases, their time was extended by six months, greatly increasing their overall productivity.

Prior to his arrival at Los Baños, it had been arranged for Professor Uhler to teach techniques courses in entomology and zoology and to assist in the rodent research program. Professor Uhler also spent considerable time consulting with specialists on rodent control, particularly in the use of new anti-fertility agents and reviewing available literature.

In addition to the course in techniques in entomology and zoology, Professor Uhler taught a course in insect ecology. Like most of the visiting professors, he found that one of the major problems experienced in teaching laboratory courses was lack of equipment, the time involved in purchasing it, and the difficulty of securing funds. It was expected that some of these problems would be solved with the establishment of a central scientific store, which at that time was in the planning stages.

In order to set up a rodent research control program, Professor Uhler first took the time to become familiar with the rodent situation in the Philippines. Along with colleagues from the UPCA, he spent several days in Mindanao in consultation with staff members of the BPI and touring rat-infested areas. Consultations were held with representatives of USAID and scientists from the Fish and Wildlife Center, Pest Control Unit, Denver, Colorado. It was decided by USAID to establish the South Pacific Rodent Control and Biology Research Unit on the UPCA campus at Los Baños. The fundamental research on rodents for the South Pacific would be done here, in cooperation with a station in Hawaii.

Biological data on rodents in the Philippines was needed to develop

sound management practices. It was necessary to determine when populations are high or low, when the largest per cent of females are pregnant, how far the rats range for food, and other questions of this type. As a result, Professor Uhler initiated research that involved five Filipino staff members to provide biological data needed. Much of this work was done in cooperation with the experimental plots of IRRI. Records of rats killed on the electric fences at the IRRI experimental plots for two years revealed a bi-modal population curve. Population peaks occurred from June to August, and from November to February, with the low point running from March to May. Seasonal reproductive activity was studied as part of a routine necropsy of rats killed and collected twice weekly on the electric fences. By calculating the percentages of perforate, pregnant females and females having placental scars, it was determined that the female rice-field rat breeds actively during the dry months, March through May. In June and July, although the population reaches a peak, the per cent of pregnant females was found to decline, only to rise again in August, September, and October. This information has important implications for the timing of a control program. Laboratory experiments were conducted on the use of Mestranol, an anti-fertility agent, produced by the Syntex Corporation.

These preliminary investigations under the leadership of Professor Uhler, stimulated a great deal of interest and emphasized the need for continuing basic research in rodent biology, i.e., population dynamics, reproductive behavior, home range, etc., for the major islands and land areas of the Philippines. Further, it would be logical for this work to be tied in closely with that which would be carried out by the AID research team whose members were to arrive at Los Baños a few months later.

Tropical conditions with more or less continuous vegetation and cropping (where irrigation exists) provide a suitable environment for explosive increases in the population of insects. Frequent tropical rains and high temperatures also create a problem regarding application and retention of pesticides by the foliage and other plant parts. There are hundreds of species of insects in the Philippines of which several hundred are of economic importance to man. It is difficult to select from among many insect problems those which are most urgently needing attention and ones for which solutions appear possible. It was with some of these problems in mind that Professor E. H. Glass was invited to Los Baños to cooperate on fruit and vegetable insect control projects.

Professor Glass felt that it was important to investigate carefully the biology and seasonal occurrence of pest species as well as chemical control. In the latter category, he made plans to determine the possibility of making full use of systemic pesticides which would not be subject to the weathering action of rains, and which, in several instances,

had been proven to have fewer deleterious effects on natural control agents than residual contact pesticides. After thorough appraisal of the situation and discussions with Filipino colleagues, it was decided jointly to investigate entomological problems on three separate crops. These were 1) the biology and control of leaf hoppers on mango, 2) control of insects affecting rice, and 3) the biology and control of the diamond-back moth on cabbage and cruciferous crops. Fortunately, the aims and objectives decided upon coincided closely with the interests of Cyanamid (Far East Limited) and this firm made available two grants-in-aid to the College for support of the field research to study the value and use of certain systemic insecticides in rice and vegetable production.

Studies were made on the occurrence and abundance of leaf hoppers of mango throughout the year. Two species were observed to reproduce only on the flowers and flower parts and to be abundant only during mango flowering periods. Another species was found to feed and reproduce on foliage, apparently most successfully on young but fully developed leaves.

Much work already had been done by the College and IRRI entomologists on rice insect control, but most of it had been done at Los Baños. Reports indicated that control programs developed at Los Baños were not always effective in the Central Plains area of Luzon, the main rice-growing area. Because of this, two experiments, one for the dry-season crop and one for the wet-season, were designed and conducted in cooperation with personnel at the Maligaya Rice Research and Training Institute of the BPI. In the dry-season crop of this experiment, early borer injury destroyed up to 94 per cent of the tillers. The results demonstrated, therefore, that commercial control of stem borers during the dry season in Central Luzon requires protection beginning at about ten days after transplanting until the plants are no longer susceptible to borer attack. Infestations of the stem borer were found to be light and inconsequential during the early part of the wet season. Late attacks, however, were quite serious. It was evident from these experiments that an effective rice insect pest control program for the wet season has much different requirements than for the dry-season crop.

Both dry-season and wet-season experiments were conducted at the BPI Station in Baguio on the control of the diamond-back moth and other insects attacking cabbage. The most significant development of this work was the discovery that one application to the soil of a phosphate systemic (Cyolane) in the granular form at transplanting and again six weeks later gave excellent protection against the diamond-back moth for the entire crop season. Tests made during the wet season suggested that this phosphate systemic would have to be

applied at approximately four-week intervals during periods of almost continuous rainfall to provide good control. These experiences also brought out the obvious fact that there was much need for improved varieties and production technology in growing cabbage. It was estimated that yields of cabbage could be easily increased by 50 per cent and perhaps doubled by the development and application of improved plant material and production methods.

Professor Glass was exceedingly enthusiastic about the progress that was made in his work and that of his colleagues during the relatively short time he was in the Philippines. It opened up many areas that should be expanded and others where research should be initiated on the biology and control of important insect pest problems of the major crops in the Philippines. For example, biological studies that are basic to sound control practices should include individual insect development, seasonal population development and fluctuations, environmental requirements, host ranges, parasites, predators, and diseases. Control studies should include evaluations of chemical and nonchemical control programs in attempts to develop suitable population regulation or control. It was further stressed that pesticide residues cannot be effectively controlled and regulated without control recommendations which food producers can follow and be assured of safe residue levels. In this connection, Professor Glass emphasized the desirability of close liaison with industry because of the value it would have in providing a flow into the department of information about problems and conditions from the provinces and other countries. Furthermore, sound research programs at the College for the development of control programs and recommendations would attract grants-in-aid from chemical and pesticide manufacturers.

As mentioned briefly earlier, Professor Roger G. Young had a split assignment of 18 months at Los Baños, dividing his time between Agricultural Chemistry and Entomology. Major attention was given to plant residue studies and the development of a pesticide residue laboratory with well-trained personnel and modern analytical facilities. A committee in 1966 had examined the College's role in the national and world problem of pesticide residues in foods and recommended the establishment of a residue laboratory.

### *Staff Training*

A fairly large number of young staff members went abroad for advanced training in Entomology and Zoology, but only one was selected for an assistantship at Cornell under the UPCO program. He was Assistant Professor Leo C. Rimando who went to Cornell in the summer of 1969 to pursue studies toward a Ph.D. in Entomology with systematic acarology as a field of specialization. Prior to his enrollment at Cornell,

Professor Rimando took courses in acarology at Ohio State University during the summer session, 1969. Mr. Rimando experienced some difficulties in adjusting to graduate studies and his assistantship responsibilities at Cornell and his program was further aggravated by illness during the first semester. At the end of the academic year he withdrew from Cornell and returned to Los Baños.

Miss Soledad Rivera went to the Pennsylvania State University on an UPCO fellowship, earned the Ph.D. in Zoology, and returned to the UPCA for teaching and research.

## PLANT PATHOLOGY

### *Consultants in Plant Pathology*

Early in the UPCO program, Vice-President Umali and others in administration of the UPCA requested the services of experienced scientists for periods of three or four months to appraise existing educational and research programs and assist in charting priorities for the future. Professor G. C. Kent, head of Plant Pathology at Cornell, and his family, had been at Los Baños in 1952-1954 during the early regrowth of Plant Pathology at Los Baños following World War II. With this background of experience and knowledge of the situation, Professor Kent was invited to return for three months in August, 1965. Working with the committee that was established for this purpose, Professor Kent reviewed and offered suggestions in three broad areas: (1) research programs of the department, (2) graduate training, and (3) pesticide residues.

It was quickly apparent to Professor Kent that an urgent national need existed for data on pesticide residues resulting from actual and recommended agricultural chemical applications. Basic knowledge of chemical residues in or on agricultural products must be collected before the basic legislation and reasonable regulations and interpretations of laws could be written. At that time the only facility for residue studies at the College was a small insecticide residue-toxicology laboratory being set up in Entomology.

Many visiting professors and consultants had observed that one of the chief hindrances to the staff of the entire College in carrying out their responsibilities in both teaching and research was that of obtaining supplies and materials. Professor Kent and his committee studied this problem and recommended to the administration that a committee be appointed to study and develop a mechanism for the establishment and operation of a central scientific store. This recommendation was implemented and in a few years the Central Scientific Supply House was functioning. Its development and operation will be discussed in a separate section.

Considerable attention and careful analysis was given to the several functions—teaching, research, and extension—of the departmental program in plant pathology. In teaching, for example, it was agreed that special emphasis should be placed on the preparation of texts and syllabi for each course.

The need for a plant disease survey was recognized to provide information on the occurrence, distribution, and severity of diseases of plants in the Philippines. Such data are essential in the establishment and enforcement of Philippine quarantines and in evaluating quarantines placed on Philippine crops by foreign countries. It was also pointed up that the department seriously needs a functioning herbarium for both its mycological and pathological programs.

Two specific suggestions were offered that hopefully would upgrade research and teaching on a College-wide basis. The first was to conduct a research workshop on how: (a) research needs are identified and evaluated; (b) projects are designed on the basis of needs; (c) individual experiments are outlined and conducted; (d) experiments are evaluated; and (e) annual reports can keep research programs summarized and related to the basic objectives. The second suggestion related to the desirability of having a workshop on teaching. Such a workshop could examine teaching methods, use of lecture and laboratory *versus* group conference or other teaching methods; development of texts and syllabi; use and preparation of visual aids; development of specific objectives for courses and their implication; relation of lectures and laboratories to course objectives; and evaluation and the relation of examinations to objectives of courses. Both of these suggestions were implemented later and provided very stimulating discussions and experiences for all levels of the faculty.

In his terminal report, Professor Kent mentioned that downy mildew appears to be potentially one of the most dangerous problems of corn in the Philippines, if not all of Southeast Asia. The disease has been recognized for half a century but relatively little is known about its mechanism of action. Later this became the major research thrust of one of the visiting professors.

In January 1968, Professor H. D. Thurston, international plant pathologist from Cornell, spent six weeks at Los Baños giving special attention to needed research on downy mildew of corn. This disease, which was first described in the Philippines in 1916, is found in all corn-growing areas of the Philippines but is most serious in Mindanao where yield losses of 40 to 60 per cent are common during the wet season. In recent years considerable progress in downy mildew research had been made by staff members of Plant Pathology at the UPCA, notably Dr. O. R. Exconde, who served as chairman of the faculty committee that worked with Professor Thurston while he was on this consulting assignment.

In cooperation with other staff of the UPCA, Dr. Exconde and his associates had studied over 450 corn accessions under epiphytotic conditions in the field and 11 highly resistant lines, all of local origin, had been identified. The sexual stage of the fungus had been found. Several studies were under way on the pathology of the organism, but more work was needed and the committee summarized the following as the most essential areas for further research: 1) testing of resistance in the field; 2) processes of infection; 3) taxonomy; 4) host range; 5) epiphytology; 6) control by cultural and chemical means; 7) sexual stage of the causal organism; and 8) nature of resistance to the disease.

### *Visiting Professor*

Following Professor Thurston's assignment and because of the importance of the downy mildew disease in corn in the Philippines, a request was made to Cornell to provide a visiting professor whose primary research involvement would be with local staff and graduate students on the downy mildew project. Arrangements were made, therefore, for Dr. Otto E. Schultz and family to go to Los Baños for a two-year period beginning in June, 1969. Unfortunately, there were no graduate students available to work with Professor Schultz at the time of his arrival and, furthermore, the staff structure of the department was such that only a few lesser-trained instructors were on hand to work with him. Because of these circumstances, Professor Schultz's involvement in formal graduate education was limited and personally conducted research occupied most of his time.

These research activities involved two areas of investigation: 1) controlled environment studies on pathogenesis of *Sclerospora philippinensis*, the causal fungus of Philippine downy mildew, and 2) field experiments on control. Later a graduate student worked closely with Professor Schultz on the controlled environment studies. The objective of this work was to determine the influence of inoculum and other environmental factors on the pathogenesis of the fungus with the expectation that the information obtained would be utilized to formulate an accurate artificial inoculation technique which would assist plant breeders in rapid screening of breeding lines for downy mildew resistance.

In spite of an active corn breeding program at the UPCA, in which downy mildew resistance was one of the primary goals, high-yielding resistant varieties were not yet available to the Philippine farmer. Until such time as these varieties would be available, the feasibility of chemical control warranted investigation. As a result, Professor Schultz developed several approaches to chemical control which were evaluated in field experiments. These included three areas: 1) foliar application of protectant chemicals, 2) application of systemic fungicides to

seed, soil and foliage, and 3) application of nonfungicidal compounds to soil or foliage in order to alter disease reaction. Because of the relative simplicity and economy of seed treatment, this application method was the first to be evaluated. Of a large number of materials tested, only one of them showed any promise. In further studies involving foliar application in combination with several seed and soil treatments, some protection against infection was provided. As a whole, the findings indicated that a farmer might be able to achieve economically feasible partial control with a limited number of chemical applications.

At the completion of his assignment in May, 1971, Dr. Schultz stated:

"The College is now endowed with research and teaching facilities which would hold their own against most in the world. But much more important than physical hardware is the young, highly qualified faculty. Of thirteen professors with specialized training in virtually all phases of plant pathology, nine hold the Ph.D. degree. Four instructors with the M.S. and five research or teaching assistants with B.S. degrees round out the academic staff. Two instructors are currently following Ph.D. programs in the United States. Provided the faculty does not suffer future attrition, academic manpower resources are adequate."

As food for thought, Professor Schultz raised a number of questions in his terminal report. Selected questions are the following: 1) Is plant pathological research being directed sufficiently toward solving problems which are of major economic importance to the Philippine farmer? 2) Is sufficient attention being paid to the applicability of research to commercial agriculture in the Philippines? 3) Is sufficient emphasis being placed on attacking problems on an integrated interdisciplinary basis? 4) Are students of Plant Pathology being exposed to the best mix between fundamental and applied aspects of the discipline to allow them to contribute most effectively to local agriculture? 5) Is the department perhaps spreading itself too thin in its subject-matter scope rather than establishing a strong foundation in basic areas which are of immediate importance to Philippine agriculture?

### *Graduate Student Participants*

In the graduate student phase of the program, there was only one participant from Cornell in plant and animal protection, Mr. Eldon I. Zehr, a Ph.D. candidate in Plant Pathology. The problem selected for study by Mr. Zehr was the bacterial wilt caused by *Pseudomonas solanacearum*, a disease affecting crops such as tomatoes, eggplants, peppers, potatoes, ginger, tobacco, and many others. It is one of the most severe and widespread diseases in the tropics and causes annual losses of 3-5 million pesos in the Philippines. The aspects chosen for

study were distribution, economic hosts, and variability of the causal bacterium in the Philippines. In his investigations, Mr. Zehr found that tomato, eggplant, pepper, tobacco and potato are seriously attacked in almost every section of the country visited, the only exceptions being the high mountain elevations in the mountain province and a few limited coastal regions. He also confirmed that abaca is susceptible to the disease under certain favorable environmental conditions and perhaps in conjunction with other micro-organisms.

A major portion of Mr. Zehr's research was devoted to studies on pathogen variability. There are numerous strains of the bacterium which vary greatly in their ability to attack different crops. Most are highly virulent to tomatoes; however, some strains cannot attack tobacco while others are of high virulence to tobacco. Similar variability was observed on peanuts, peppers, and ginger, and to some extent on potatoes. Greater variability and host range was observed among isolates collected in Luzon than among those collected from other parts of the country. This may be due in part to the fact that Luzon has been planted to susceptible crops over a longer period of time than have other parts of the country. Tobacco plants inoculated simultaneously with highly-virulent and low-virulent strains showed resistance to the highly-virulent strain. This was thought to be due to a defensive mechanism on the part of the host plant which might be utilized in disease control.

As part of his assistantship responsibilities, Mr. Zehr taught two courses, one a survey of bacteria as they relate to agriculture and human welfare, and the second emphasizing techniques relating to the study of micro-organisms which affect agriculture, especially bacteria.

Another graduate student from Cornell, Mr. K. P. Dumont, spent eight months in the Philippines conducting research for his Ph.D. thesis on a grant from the National Science Foundation to his major professor, Dr. R. P. Korf, for a project on "Monographic Studies in the Discomycetes." In return for housing and other limited support, Mr. Dumont concentrated some of his efforts in working with the College in organizing the herbarium in Plant Pathology. With the progress made in this area, it was felt that the UPCA herbarium in a few years would be the best plant pathological herbarium in any school in the tropics.

### *Evolution of Extension at Los Baños*

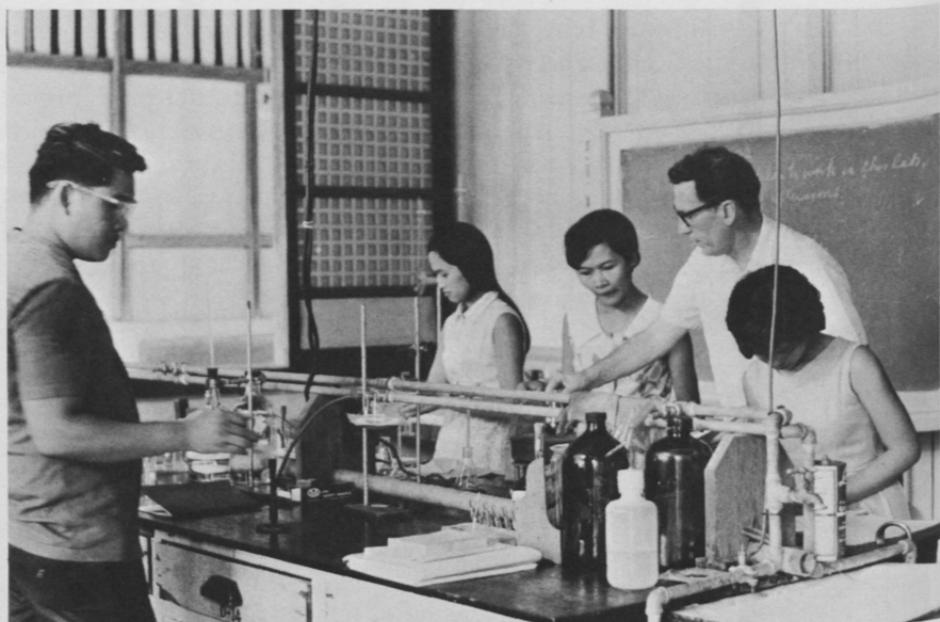
Even though the Cornell-Los Baños program had been terminated in 1960, a continuing linkage existed between Cornell and the UPCA through the work of Dr. Horst von Oppenfeld in Agricultural Economics. The Council on Economic and Cultural Affairs (later becoming the Agricultural Development Council) continued its grant support to Cor-



*Research on control of rice insects was expanded to the major rice-growing areas during the tenure of E. H. Glass, Visiting Professor of Entomology. Filipino colleagues Mateo P. Ferino and Feliciano B. Calora are cooperating here with staff of the Maligaya Rice Research and Training Institute in Central Luzon.*



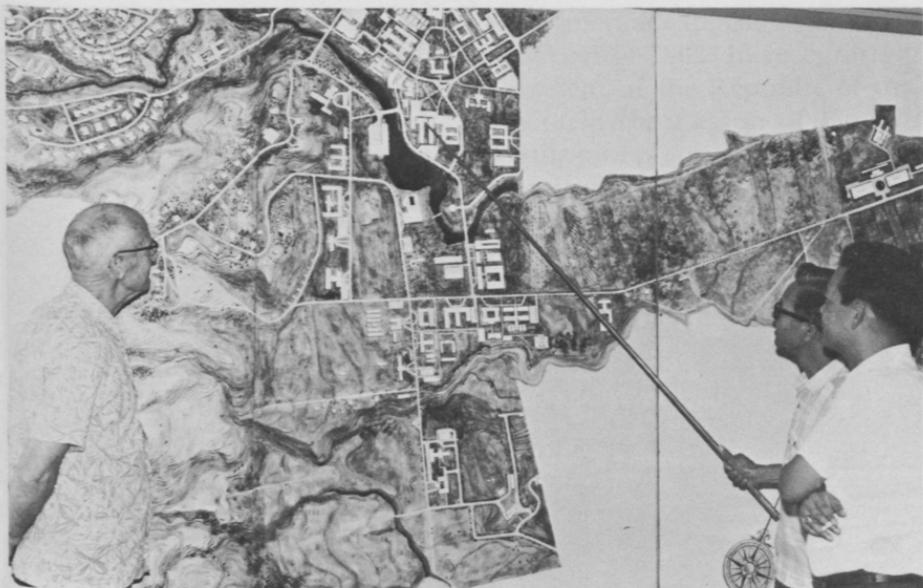
*Corn breeding research on downy mildew. C. A. Francis, UPCO graduate assistant, selects lines resistant to this devastating disease of the tropics.*



*Roger Young, visiting professor from Cornell in Agricultural Chemistry, helps undergraduate and graduate students identify organic compounds.*



*Research on plant diseases expanded under the UPCO program. Plants in pots on benches are experimental materials used by Eldon Zehr, UPCO graduate assistant, in host range studies of *Pseudomonas solanacearum*. Those on ground are resistant tomato cultivars used by J. R. Deanon in breeding studies.*



*Five-Year Development Program, financed jointly by the Philippine Government and the World Bank, is discussed by J. E. Knott (left), visiting professor, with F. A. Bernardo, Acting Director of Business Affairs, and J. J. Flor, Director of Physical Plant.*



*View from the main entrance to the campus in 1973 shows the new administration building on the left and the new communications building on the right. The carabao heads and alumni monument formerly at the campus gate now are located in the mall between the two buildings.*



*Among a dozen major new buildings for teaching and research constructed on the College campus under a loan from the World Bank with matching Philippine funds is this one for Biological Sciences (Botany, Entomology, and Plant Pathology).*



*The Los Baños Union provides dining and recreational facilities for students and faculty.*

nell for Dr. von Oppenfeld's work in experimental extension and farm and home development through the early part of 1962. In recognition of his outstanding contributions, the President of the Republic of the Philippines awarded Professor von Oppenfeld the Legion of Honor, Officer's Degree, on his last day in the Philippines.

Extension work in the College of Agriculture began in 1958. By that time the College was well known in the region and had supplied the Philippines and neighboring countries with agricultural leaders, administrators, teachers, and technicians.

In agricultural research, the College had a deserved reputation as the leading experiment station in the country; yet the results were more readily observable in student theses and in the publication of papers in scientific journals than in their influence on farm practices and output. Relatively few of the College faculty were out working with farmers or even appreciated fully the mission of the College in relation to the agricultural problems of the country.

#### FARM AND HOME DEVELOPMENT

Agricultural economists at the College diagnosed the lack of technical and managerial knowledge of farmers as one of the principal bottlenecks. They were not satisfied with mere speculation about the limited effect of research on farmers' practices and incomes; they became interested in studying how to transfer technology to farmers more effectively. To do this a field pilot study was designed. For the first time the College deployed technically competent change agents in selected villages upon a sustained basis.

The pilot study in farm development had these objectives: (1) To investigate the farm management problems of incorporating the results of present-day research on individual farms; (2) To determine the effect of recommended farm practices on farmers' incomes; and (3) To train technically competent change agents.

The success of this program in assisting farm families led to a program in which the College trained teams of people in the farm and home development process. These individuals were sent to the College for training by banks, government agencies, commercial organizations and others.

In 1962 extension activities of the UPCA expanded abruptly. The former Extension and Publications Office became the Department of Agricultural Information and Communications. The Farm and Home Development Office (FHDO) was created, thus transferring an extension training function from Agricultural Economics to this new unit.

The alert and able leadership of Leopoldo P. de Guzman, officer in charge of FHDO from October 1962 to May 1964, contributed much to the effectiveness of training, the orderly development of the extension-

research project, and the high standards and excellent morale of the field staff. Perla Tagumpay provided splendid leadership as training coordinator.

Professor M. C. Bond and Mrs. Bond arrived at the College in September, 1962, to continue the productive work that had been carried out under the leadership of Professor von Oppenfeld. Dr. Bond had just recently retired as Director of Cooperative Extension at Cornell and was eminently qualified and experienced to work with the faculty at Los Baños and the field staff in extension.

It should be noted that Dr. Bond's activities during the year 1962-1963 were supported under the grant of the Agricultural Development Council, but were transferred to the new UPCO program on September 1, 1963. Major support for the activities in farm and home development and extension came from a supplementary grant from the Ford Foundation to the UPCA.

The training programs of college graduates for work in farm and home development expanded during the next couple of years. An economic study was made of farms in Laguna Province for purposes of adequate planning for extension work in the barrios. A marked expansion was accomplished in the dissemination of agricultural information by the College, with press releases and radio briefs in English and five Filipino dialects. For the first time the FHDO training program included persons from a foreign country, with six of them from Thailand. A large number of field officers of the Bureau of Plant Industry were provided with special three-weeks' training sessions emphasizing farm management.

An experimental extension project with built-in continuing research was inaugurated in 40 barrios. Field technicians were established in barrio extension assignments. Hundreds of farm and home records were obtained, and the information from these records was made available to the field technicians to aid in developing their programs. Research staff in the College were responsible for programming and analyzing the research aspects of this joint extension-research endeavor.

With the rapid expansion of extension activities at the College there were naturally a number of problems that occurred, some internal and others external. Many of these problems were largely due to lack of adequate communication and understanding. But the fact that questions came up indicated that staff members were aware of the FHDO and that funds were available for the further development of extension. It demonstrated, however, that people in general had little understanding of the program that was being designed to contribute to the development of extension at the U.P. College of Agriculture.

Relationships with national extension agencies became increasingly important with the expanded activities of the College. Was the College

competing with extension agencies in placing farm and home development training teams in nearby barrios? Did the College plan to take over all of extension in Laguna Province as suggested by the Governor of the province? Although there was some evidence of fear of competition by some government agencies engaged in agricultural and rural development, a mutual development of the experimental extension-research project brought government agencies into a cooperative relationship with the College in eight barrios in two municipalities where this study was being conducted. The experimental extension program with built-in research and further emphasis on the training function as an appropriate role for the College helped allay apprehensions that appeared to be developing.

The Coordinating Committee on extension, appointed in December 1963 by Dr. Umali, with Professor Bond as chairman, developed the attitude that the very best policy for the UPCA was to concentrate its extension efforts on those activities which the other extension agencies of the government were not presently performing. This would create a specialization for the College in extension which could supplement and support the extension functions of existing agencies. It was the committee's recommendation, therefore, that the UPCA extension function be focused, at least for the time being, on these groups of activities: (1) Training of extension workers (both pre-service and in-service) and interested persons in extension education and in subject matter (technical agriculture); (2) Research on extension approaches and extension programs, including evaluation of existing projects; and (3) Education of rural people in their own locales in cooperation with existing extension agencies.

These recommendations became the established policies of the College's extension program, and have been followed since that time.

Professor Bond observed in his terminal report in 1964:

"On the whole, the development of the extension program of the College moved forward in an orderly and effective manner, even though rather rapidly. Gradually, more and more people in the College and outside became informed of the general objectives and the specific activities being implemented."

Upon the termination of Professor Bond's assignment in the summer of 1964, he was succeeded by Dr. A. E. Durfee, Associate Director of Cooperative Extension in the New York State Colleges of Agriculture and Home Economics. Professor Durfee and his family remained in the Philippines for eighteen months working effectively with all aspects of the extension efforts of the College.

#### DIRECTOR OF EXTENSION EDUCATION APPOINTED

For the past several years many people had emphasized the desirability of having College-wide leadership and coordination of ex-

tension as early as possible. In December of 1964, Vice-President Umali recommended to President Romulo and the Board of Regents that the position of Director of Extension Education be created in the College of Agriculture to parallel the positions of Director of Research and Director of Instruction. The recommendation was approved and Dr. Basilio N. de los Reyes was appointed to the position effective January 4, 1965. It was felt the position of Director of Extension Education would be the new factor which would make it possible for the College to work through other agencies to enlarge its potential for helping agricultural development in the Philippines.

#### EXTENSION SPECIALISTS APPOINTED

The College budget for 1963-1964 included positions for six full-time extension positions. Two each were placed in Animal Husbandry and Agronomy, and one each in Home Technology and Plant Pathology. Later in the same year, the Dean requested all departments to appoint extension specialists no later than July 1, 1964. Most departments were able to comply even though most of the new specialists could not be relieved of other duties and many of them were taking graduate studies which added to their difficulties in functioning effectively in their new extension role.

During the first year and a half, good progress was made in staffing the specialists' positions, but there was a rapid turnover after that time. Some resigned from the College, others transferred to other work, and for a while it was most difficult to obtain staff with qualifications and interest to work effectively in the extension function. Since the extension specialist position was new to the UPCA scene, special efforts were made to develop methods of work, clarify relationships, and to identify specific information which is ready to extend and which is related to the real needs of the people. These specialists were pioneering in a new line of work for the Philippines and there were few guidelines and no fund of accumulated experience and know-how to assist them in determining their audience, in selecting methods of work, and evaluating results.

As the visiting professor and extension consultant, Professor Durfee worked very closely with the Director of Extension Education in the development of an effective program. Such a program does not happen; it must be planned and the plan must be made to work. Efforts were made to have the specialists, in consultation with colleagues in their departments, identify specific problems for which definite and tested recommendations could be made. The Director and the visiting professor visited each of the departments to discuss the extension function of the UPCA and to encourage them to make further efforts to identify the subject matter which they had to extend to rural families.

With the appointment of the Director and an expansion of the overall extension responsibilities of the College, questions naturally came up frequently on the future of the FHDO. Many people felt that it should be discontinued or absorbed more fully into the extension program and operate under the Director. Actually, the Director was asked to remain as officer-in-charge of FHDO along with his new duties. With the continuing existence of the FHDO, however, there was not a clear distinction between its objectives and that of the total UPCA extension function in the minds of many people.

#### EMERGING EXTENSION ACTIVITIES

Now that extension education had become a formal part of the College, and the concept was beginning to crystallize and patterns of doing extension work were emerging, it was decided that the next visiting professor should come from among the extension specialists' ranks at Cornell. Dr. H. R. Ainslie, Professor of Animal Science (Extension), with wide and successful experience in working with farm people, joined the UPCO team. He and his family arrived in the Philippines in January 1966 to succeed Professor Durfee. Although extension had been in existence for a relatively short time, Dr. Ainslie noted upon his arrival that "Much progress had been made in determining the extension function, developing an extension philosophy, and putting forth an extension program." This philosophy was well stated by Director de los Reyes, a few months later in a seminar-workshop:

"Extension is a well-planned program of bringing results of agricultural research and technology to the rural people in many ways to help them solve their problems of agriculture production and home, family and community living. It seeks to help farmers analyze their problems and bring these problems to the attention of scientists so that solutions may be found. It is a democratic and cooperative endeavor among many agencies and groups designed to provide the farm family and others with the latest scientific information so that they may derive more benefits from their efforts. The end view is to help the farm family attain a better level of living, develop an ability to make sound decisions and become a more active and productive member of the community.

"The extension education program of the U.P. College of Agriculture seeks to attain these objectives by working with and through the different agencies engaged in extension and extension-type activities. It seeks to complement rather than duplicate functions by developing strong cooperative relationships with different institutions."

To help accomplish these objectives, Professor Ainslie made a concentrated effort during his eighteen months of service to develop good working relationships with all government and private agencies. Spe-

cial attention was given to the Agricultural Productivity Commission (APC). Specialists of the UPCA were invited to serve as resource persons at APC training meetings and to travel with and assist APC field staff. A Memorandum of Understanding between the APC and the UPCA was signed which formally put into effect a rice production in-service training program for APC field technicians. Under this memorandum, two eight-week schools were conducted at Los Baños, training a total of 60 farm management technicians.

Arrangements were made for the UPCA to conduct a series of training programs in rice production for technicians of the Rice and Corn Production Coordinated Council (RCPPC), BPI, and PACD. Some of these training programs were conducted at the College and others were in various regions of the Philippines. The ground work was laid for the College to become more actively engaged in a one-year rice production training program to train rice specialists, in cooperation with the International Rice Research Institute. Many types of in-service training programs in several subject-matter areas were organized and carried out in order to multiply the efforts of the UPCA extension program and to strengthen the subject-matter competency of the extension field personnel.

These and similar activities provided evidence that the UPCA was being looked to as the leader in agricultural development. Many national organizations sought the assistance of the UPCA in carrying out their programs and in conducting their national conventions and meetings.

Efforts were made to increase the number and quality of extension subject-matter specialists, particularly for rice, corn, vegetable, and livestock production, and in those fields related to the production and utilization of these commodities.

The Rice Information Cooperative Effort (RICE), which had been established earlier, continued its activities with one of its most significant contributions being the publication of the revised Rice Production Manual in 1967. This was a comprehensive manual dealing with all phases of rice production from the morphology of the rice plant to the harvesting, threshing, drying, storage, and milling of rice. This manual served a very important function as the basis for instruction of all in-service training programs at the UPCA and IRRI. In addition, the manuals were distributed to all provincial agriculturists, provincial rice production specialists, farm management technicians of the UPCA, and extension personnel of other agencies, both private and public, who were concerned with rice production. Support for the RICE program was assured for another three years from the Ford Foundation through the UPCA-UPCO program.

## EXTENSION TO IMPROVE FOOD CROP PRODUCTION

By mutual agreement between the U.P. College of Agriculture and Cornell University staffs, it was decided to station the next visiting professor in extension in the subject-matter Departments of Agronomy and Soils with his major assignment to strengthen the involvement of the UPCA with the Philippine national agricultural agencies in rice production and in soil fertility toward the common goal of national economic development. Professor Reeshon Feuer, Extension Professor of Soil Science and departmental extension leader in Agronomy at Cornell, was selected for this assignment and arrived in the Philippines in December, 1967. His original assignment was for two years, but this later was extended for the duration of the UPCO program and he served for a total of four and one-half years. His early emphasis was on rice production, but later his responsibilities were enlarged into all of the upland farm crops.

The decision to assign Professor Feuer to the subject-matter of both Agronomy and Soils proved to be a wise one. It enabled him to work freely at the subject-matter level with professional counterparts and colleagues in staff development in both departments as well as to seek guidance and consultations with the Director of Extension Education in strengthening the role of the College in its extension responsibilities throughout the Philippines.

As he enthusiastically approached his duties in the Philippines, Professor Feuer soon realized the numerous minor to major constraints that handicapped effective national cooperation toward a common goal of more food production. Rather than finding a happy family of agencies eagerly cooperating toward the critical national need for food production, it was evident that each agency was highly individualistic and tended to operate its own program with apparent little regard to the capabilities or the assigned responsibilities of other agencies. Although a national coordinating agency existed, the NFAC, whose members are heads of the several independent agencies, the cooperative national programming achieved is only partial. Agricultural planning and programming is strongly centralized, resulting in only minimal feeling at the local level that a program is "our program;" rather, current programs were commonly referred to as "the NFAC program" or "the government's program." In addition, the lag time and difficulties of securing release of funds for approved projects were severe.

In spite of these and other constraints, tremendous progress was made during the next four and a half years in staff development and in bringing about closer working relationships in the many national agricultural development programs.

Professor Feuer was an active participant in these cooperative programs that brought together the UPCA, IRRI, many national agencies, and private industries with resulting increases in the adoption of new high-yielding crop varieties. As never before these extension-research activities placed the College in a recognized position of national agricultural leadership.

Highlights of these activities and accomplishments are summarized in Chapter X, "Progress in Attainment of Goals."

### *Home Technology*

The Department of Home Technology as a unit of the College of Agriculture is committed to the advancement of the University's goals—through the threefold functions of research, instruction, and extension education. The advancement of new frontiers of knowledge, and recognition of pressing problems of the home and family and their alternative solutions, and the interpretation, dissemination, and use of scientific knowledge must go hand in hand as rural development proceeds. The department gradually has grown to meet these challenges since its establishment in 1951.

The Department offers a curriculum for the B.S. degree in Home Technology, conducts studies on pressing local problems, helps with in-service training of groups in extension and allied areas, and works with field technicians through seminars and publications. Specifically, the department has the following objectives:

1. Professional preparation for students to become effective teachers and extension workers in the rural setting, as well as to become homemakers.
2. Solution of immediate and long-range family problems through research and dissemination of information to the rural population.
3. Vigorous assistance to field workers—extension personnel, teachers, community development and social workers—and to some extent and in varied ways to families in order to help increase their effectiveness.

With these objectives the primary function of the Department is to provide education for rural homemaking and teaching. Gradually, as the program has developed over a period of years, emphasis shifted to the preparation of professional workers in extension and rural education. Its original orientation has continued, but cooperative relationships have existed with the College of Home Economics at Diliman.

Some measure of growth and development is shown by the comparison of the academic staff in 1963 and again in 1973 along with the composition of the staff by rank and level of training (Table 20).

Home Technology is one of the few departments in the College that has not shown growth in numbers of staff over the past ten years,

TABLE 20. Distribution of Academic Staff by Rank and Level of Training in Home Technology, 1963 and 1973

	1963	1973		1963	1973
Professor .....	-	-	Ph.D.	2	4
Associate Professor .....	-	3(1)*	M.S.	4	8
Assistant Professor .....	3(1)*	5	B.S. B.A. only	10	2
Instructor .....	9	6(1)*			
Assistant Instructor .....	2	-			
Research Assistant .....	2	-			
Total .....	16(1)*	14(2)*		16	14

\*Numbers in parentheses refer to staff on leave of absence.

but it has shown substantial development in the proportion of its staff with advanced levels of training and in promotion to the professorial grades. Staff development in this department has taken place largely without support from the UPCO program, except for research.

In the early stages of the five-year development program, the staff in the Department requested the services of visiting professors, to be started by consultants who would assess the Department's programs and help set directions for the coming years. For various reasons, however, these requests were not given priority by the college administration until 1966 when arrangements were made for consultants from the New York State College of Home Economics at Cornell University. Dr. Helen G. Canoyer, Dean of Home Economics at Cornell, spent a month at Los Baños reviewing the work in Home Technology with Professor Mary B. Wood of Cornell who was there for two months. Professor Wood worked with a local College-wide committee to assess the departmental programs and offered recommendations for programs in the future. It was recognized that the Department suffered from many inadequacies, yet the potentialities of the staff and course offerings placed it in a very strategic position to develop a dynamic program that would contribute to rural families in the Philippines and Southeast Asia. The many strengths in the Department were recognized and recommendations were made to build on these strengths to increase the scope and depth of programs. It was also felt that the department should expand its graduate education activities as adequately qualified staff members became available.

In view of the national goals to which the College of Agriculture is committed, the subject-matter areas which the Department needed to expand include:

1. Food and nutrition, with emphasis on more effective nutrition education, and on research related to nutritive content of foods, and to the development of new foods and food products that are economi-

cal to produce and distribute, high in nutritive content, and acceptable to consumers.

2. The Filipino family, with emphasis on the values, beliefs, and practices that influence human development and interpersonal relationships and various rural areas throughout the Philippines. Literature based on scientific investigations of the Filipino family is limited. Research is needed to provide insight regarding effective approaches and methods for personnel working with rural families, and substantive content for resident and extension programs.

3. The rural Filipino consumer, including dynamics of consumer behavior, consumption patterns of rural households and individuals, and wise utilization of all resources available. Research in this area is needed as a basis for effective instructional and extension programs concentrating on those aspects of rural development which contribute significantly to the improved economic welfare of families.

A large number of carefully developed recommendations were made for future direction of the department in these subject areas, but also included general policies, staff development, budget needs, physical facilities, and cooperative relationships with the College of Home Economics at Diliman.

As a result of this work, another ad hoc committee was established to revise the Home Technology curriculum. Professor Sara Blackwell, Professor of Community Service Education at Cornell, served a ten-weeks period on this assignment beginning in January, 1968. With Professor Blackwell's assistance, this committee made a comprehensive study of the existing curriculum and made specific suggestions for revisions. In the proposed curriculum, a Home Technology graduate would be prepared to take her place in a professional position in programs concerned with rural development. It was proposed that three alternative major subjects be open to students: food and nutrition, family development, and consumer education. This would provide the basic knowledge and insights to enable graduates to deal effectively with specific problems affecting families.

#### VISITING PROFESSOR FROM THAILAND

In a developing country such as the Philippines, much needs to be learned about the quality and quantity of food intake of the people. Nutrition surveys conducted in Luzon placed many Filipinos on the borderline of malnutrition. Especially noticeable is the inadequate intake of leafy vegetables and vitamin C rich foods. Fats and oils are also quite low. With food production lagging behind a rapidly increasing population, ways of augmenting food supply seemed to be a logical step to take. With this situation, Professor Chuanchom Chandrapauraya was invited to serve as an Asian visiting professor in Home Technology for a period of six months beginning in June, 1967, to

work cooperatively with the Filipino staff in research and instruction. She was invited primarily to introduce additional foods, especially plants, that could be potential sources of critical nutrients and to improve the Filipino diet by introducing new ways of preparing common fruits and vegetables. She taught a course in food preservation, and cooperatively with Filipino colleagues, initiated a study to increase the nutritive value of Filipino meals by: a) utilizing plants not considered as food in the Philippines but that have been used in Thailand, and (b) introducing new ways of preparing some common fruits and vegetables.

Through these projects a Food Research Laboratory was completed toward the end of the semester in October, 1967. With this laboratory it was possible to carry out studies on food preparation and processing without interfering with classes in the Department.

#### FUTURE OF HOME TECHNOLOGY

The Department of Home Technology is fulfilling a very significant and important role in the mission of the College of Agriculture at Los Baños. The department has had good, vigorous leadership during the past 10 years, with modest assistance in planning from visiting consultants and a short-term visiting professor. Support from the UPCO program greatly strengthened the quality and quantity of the research and instructional programs through funds for equipment and research. Students may now enroll for M.S. degrees in Home Technology Resource Management.

Home Technology did not get new or renovated facilities under the five-year development program and, like nearly all departments, was never adequately supported by the Philippine peso budget. In view of these constraints, the growth and development that have taken place are all the more remarkable. With continuing able leadership and further development of the staff, one can be optimistic over the contributions that will be made to the Philippines and other countries of Southeast Asia.

#### *Contributions of Cornell Staff Wives*

In this review of activities of the UP-Cornell program it is important to recognize the contributions made by the wives and families of Cornell visiting professors, consultants, and graduate students to the College and Los Baños community. Almost without exception, the women and children of the Cornell group had a favorable impact on the community, thus providing fringe benefits to this type of program. The wives adjusted rapidly to community life of a different culture and soon found UPCO, College, and community activities to which they contributed their time, talents, and financial support.

Several wives donated their time and talents as visiting instructors on the College staff, teaching such courses as nutrition and dietetics, magazine writing, news writing, photography, German and French. Special seminars related to their professional fields were given. They edited project reports, textbooks and assisted with research.

Cornell staff wives devoted considerable time to library work in the elementary and high schools on campus and others assisted in the College library. They prepared special displays to enrich the educational experience of the students and to stimulate interests in learning. Several wives worked regularly in nearby elementary schools, training the teachers and students. Many hours were spent reading aloud to school children, thus assisting them to get a better grasp of the language used in instruction and helping them to speak correctly. Others worked with girl scout troops; many participated in community choirs, church affairs and the like.

Still other members of the distaff side of the Cornell group found their sphere of activity in making a contribution in the field of public health, an area needing much help in the Philippines. Working with professionals in Rural Health Clinics, going out into the barrios, and making many personal contacts proved a rewarding experience to those who participated.

A majority of UPCO wives contributed regularly, both financially and physically, to the Los Baños organization of international women known as Suhay. This group meets weekly for fellowship and through the years has contributed thousands of pesos to the medical relief of indigent patients, particularly children, many of whom would not be living today were it not for the help of Suhay. Patients often were driven to doctors and hospitals in Manila for special care, surgery, and treatment. Many of the Cornell families continue their financial assistance to needy Filipino families long after they return home.

One wife planned and conducted UPCO Tours Unlimited for all UPCO women. These were cultural trips to provide a better understanding of the Philippines, and included visits to handicraft outlets, old churches, historical shrines, Malacañan Palace, art exhibits, abaca and shell industries, and local markets. These and other activities provided opportunities to become intimately acquainted with Philippine culture and gave American women more meaningful relationships with their Filipino friends.

## Chapter X

# Progress in Attainment of Goals

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## CHAPTER X

# Progress in Attainment of Goals

In the guidelines adopted for the UP-Cornell Graduate Education Program, there was general agreement that the major objective would be the continued development of graduate education, training, and research at Los Baños. The program would provide mutual efforts directed toward the educating and training of people for leadership in the development of agricultural potentials of the Philippines and other low-income countries. Hopefully, by virtue of its quality and stature, the UPCA would become an outstanding center for graduate education and research in Southeast Asia.

As termination of the program approached, Dr. K. L. Turk spent six weeks at Los Baños in March-April 1972 for a final visit to review progress made and to make an appraisal of accomplishments. Visits were made to each of the departments to discuss programs of instruction, research, and extension with the department chairmen and senior staff and to consider priorities and plans for the future. Conferences were held also with the Dean, Directors, Officer-in-Charge of the Los Baños units, Director and Associate Director of SEARCA, and the President of the University of the Philippines.

### *Expansion of Graduate Studies*

As one reviews graduate studies at Los Baños in 1972-1973 compared with 1962-1963, there is every evidence that substantial progress has been made in attaining the basic goal that was established. Quality of graduate studies and research have greatly improved; there is greater depth and quality in the graduate faculty; increased numbers of graduate students are coming to the UPCA from other Philippine institutions and from abroad; and there is excellent leadership in the Office of the Director of Graduate Studies. There is still much to be done, but by virtue of its quality and stature, the College of Agriculture at Los Baños has become more widely recognized as a regional center for graduate education and research.

The position of Director of Graduate Studies was created in 1968 and has been effective in developing the philosophy of graduate studies as an important function of the University. Future growth and

development of graduate studies in the agricultural sciences at the UPCA will depend primarily upon the quality of instruction and research and the overall reputation of the University. Students will be attracted to Los Baños if it has a superior faculty and if it provides better training than is available elsewhere in the region.

This is already taking place, and graduate students are enrolling from other countries and from other colleges and universities within the Philippines, especially the ACAP institutions. Almost 100 graduate students in 1971-1972 came from 17 other countries, with 41 of the overseas students enrolled under the SEARCA program. One of the major limitations in attracting graduate students from outside the University is financial support in the form of scholarships and assistantships.

Growth in graduate student enrollment at Los Baños for a recent five-year period is shown in Table 21.

TABLE 21. First-Semester Enrollment of Graduate Students, 1967-1972\*

Degree	1967-68	1968-69	1969-70	1970-71	1971-1972
M.S. ....	269	285	351	386	361
Ph.D. ....	23	17	24	42	41
Total.....	292	302	375	428	402

\*Report to the Graduate Faculty at Los Baños, by Dr. F. A. Bernardo, Director of Graduate Studies, UPCA, December, 1971.

The increases in 1969-1970 and 1970-1971 were dramatic, but there was a slight decrease in 1971-1972. On the average over this five-year period, the increase was about 10 per cent per year. This is significant when one recognizes that graduate student enrollment did not exceed 80 until 1961.

Marked increases in the number of advanced degrees awarded have occurred since 1962, as shown in Table 22. The first Ph.D. was awarded in 1963, followed by a rapid jump to 17 in 1973. Some of the first Ph.D.'s awarded to students from Southeast Asia went to participants in the UPCO program.

A most significant development during the past 10 years is the improved quality and depth of the graduate faculty that provides the capability for expanded graduate studies. The graduate faculty of 207, in 1972-1973, was composed of 133 Ph.D. and 64 M.S. degree holders. They were supplemented by scientists from affiliate units, such as ACCI, DTRI, and IRRI. While the quality of graduate study today varies somewhat between departments and between areas within the larger departments, the depth and competence of the faculty now are satisfactory for good quality M.S.-level work in 83 fields. There has been remarkable progress in the quality of Ph.D. offerings which are

TABLE 22. Advanced Degrees Awarded by the U.P. College of Agriculture, 1962-1973

Year	Degree		
	M.S.	M.Agr.	Ph.D.
1962.....	16	-	-
1963.....	16	-	1
1964.....	34	-	-
1965.....	32	-	-
1966.....	39	-	1
1967.....	41	-	1
1968.....	36	-	1
1969.....	49	-	8
1970.....	47	-	4
1971.....	66	-	2
1972.....	88	-	2
1973.....	91	5	17
Total.....	555*	5	37

\*A total of 82 M.S. degrees was awarded during the period 1913-1961.

now available in forty-five disciplines.<sup>1</sup> This is in marked contrast to the situation just ten years ago.

The growth, development, and quality of graduate studies at Los Baños gradually is being recognized by educational institutions and government agencies in other countries in the region. For example, a plan was developed by universities and USAID in Indonesia in 1972-1973 whereby graduate students would go to universities in the United States for advanced, basic subjects for one or two years and then go to Los Baños for courses in applied agricultural sciences. They will enroll as Ph.D. candidates in the University of the Philippines and conduct their thesis research either at the University or IRRI.

While much progress has been made, Dr. F. A. Bernardo, Director of Graduate Studies, also recognized some of the problems facing graduate studies at Los Baños in his report to the graduate faculty in December 1971:

"Perhaps, the most serious problem facing the Graduate School at Los Baños is the financial problem. We have a top-rate graduate faculty, but successful retention of the faculty of the College will require substantial funds for salary increases. We have modern research facilities to support our graduate program, but their proper maintenance requires more funds. We have an improved library to support graduate research, but the UPCA Library had an overdraft of 67,000 pesos last year and lack of funds has already forced the Library to drop 267 titles from its subscription list. We have been receiving substantial support for graduate training and research from

<sup>1</sup>University of the Philippines Announcements, Graduate Program, College of Agriculture, 1972-1974.

the Ford Foundation under the UP-Cornell Graduate Education Program, but this is good only until June 30, 1972, the date when the UPCO program will officially terminate."

Some specific suggestions were offered by Dr. Bernardo to help solve some of the fiscal problems of the Graduate School:

1. "Our graduate program should receive more attention and support because of its singular role in graduate training in the country. Ours is the only major graduate school in agriculture in the Philippines and Southeast Asia. On the other hand, there are many other agricultural colleges offering the B.S. in agriculture in the Philippines. Viewed in this perspective, our financial problem should be solved, even at least partly, by reducing the enrollment at the undergraduate level through entrance examinations. It is therefore strongly suggested that entrance examinations be implemented for the next academic year.

2. "It is hoped that highly qualified instructors whose services may no longer be needed due to reduced undergraduate enrollment may be encouraged to accept graduate assistantships to enable them to work toward a Master's degree.

3. "Many faculty members have applied for, and received, research grants from NSDB, NRC, and other external sources. We hope this trend will continue.... Those of you who are preparing research project proposals for funding from any source should not forget to include items for graduate assistants and enough funds to support their thesis research.

4. "We are exploring the possibility of increasing tuition fees for graduate students. Graduate instruction is much more expensive than undergraduate instruction.

5. "SEARCA scholars and other foreign students are subsidized by the UPCA. It is about time that we study this problem more closely and make the necessary representations to SEARCA so that funds for the research support of scholars are made available.

6. "Possibly, UPCA shall assume a major role in the national plan to regionalize agricultural education in the Philippines."

In regard to this last point, an Education Task Force, a body created by Presidential Directive, had recommended the formation of a consortium of three regional colleges (Central Luzon State University, Central Mindanao University, and Visayan Agricultural College) and the University of the Philippines at Los Baños (UPLB). The purpose was to strengthen instruction, research, and extension in the three colleges and increase their capability to provide regional institutional leadership in agricultural and rural development. Each of the colleges would develop graduate studies in certain areas of greatest strength, and the UPLB would serve as the national graduate school of agriculture and forestry. Such a national scheme could open up a new dimension in graduate education at Los Baños. The UPCA is under-

going a transition from being recipients of technical assistance to becoming providers of technical assistance to other colleges in the Philippines.

### *Greater Depth and Quality in the Faculty*

An indication of progress in staff development of the UPCA is shown in Tables 23 and 24 which summarize training of the academic staff and their distribution by rank in the departments for 1963 and ten years later in 1973.

It is significant that two-thirds of the academic staff in 1963 held only the B.S. or A.B. degree, but by 1973 this had dropped to one-third. In contrast, the percentage of the staff with advanced degrees has gone from about 33 per cent up to 66 per cent (30 per cent M.S. and 36 per cent Ph.D.). Substantial progress has been made toward attaining the goal that was set by former Dean Umali and his associates of a faculty of 45 per cent with the Ph.D. and 55 per cent with the Master's degree.

Without exception, the staff competencies of the departments are stronger today than they were 10 years ago. Looking at the College as a whole, the greatest strengths in 1972-1973 are in the Plant and Animal Sciences. Notable advances in staff development have occurred in Agricultural Engineering. Some improvements have occurred in the basic sciences of Chemistry, Physics, and Mathematics, but these areas still are weak compared with Plant and Animal Sciences. Some areas in the Social Sciences and Communications are relatively strong while others need to be strengthened both in numbers and quality of staff.

Although much of this progress in staff development over the past ten years can be credited to the UPCO program, credit also must go to other sources of financial support. The Rockefeller Foundation has provided fellowships annually since 1955 for graduate study abroad. Others have been supported by the Agricultural Development Council, FAO, Colombo Plan, and by other national governments. Many young staff members have received graduate assistantships from universities in the United States.

In 1972 in interviews several members of the faculty and administration at Los Baños were frank to state that in their judgment several of the departments and administrative units were overstaffed, both at the academic and nonacademic levels. They felt that reallocation of existing resources would permit more effective programs in the College.

There is basis for this view since the proportion of academic staff to students is quite high, with a staff-student ratio of about 1:6. If all positions in the research assistant and assistant instructor categories were transferred out of academic classifications, the ratio would be approximately 1:9. In most educational institutions, a faculty-student

TABLE 23. Summary of Training of Academic Staff by Department 1963 and 1973

	Number of Staff with								
	B.S./A.B.		M.S./M.A.		Ph.D.		Total		
	1963	1973	1963	1973	1963	1973	1963	1973	
Agricultural Botany . . . . .	19	9	12	13	4	9	35	31	
Agricultural Chemistry . . . . .	25	16	7	3	1	9	33	28	
Agricultural Communications . . . . .	8	7	3	3	2	5	13	15	
Agricultural Economics . . . . .	18	8	2	7	5	9	25	24	
Agricultural Education . . . . .	20	12	10	12	5	13*	35	37	
Agricultural Engineering . . . . .	27	8	6	12	2	4	35	24	
Agronomy . . . . .	42	11	14	13	6	28	62	52	
Animal Science . . . . .	15	13	15	11	4	16	34	40	
Applied Mathematics† . . . . .	-	6	-	3	-	6	-	15	
Entomology . . . . .	14	2	7	8	2	11	23	21	
Food Science‡ . . . . .	-	1	-	2	-	2	-	5	
Home Technology . . . . .	10	2	4	8	2	4	16	14	
Humanities . . . . .	13	16	8	7	-	2	21	25	
Plant Pathology . . . . .	11	5	6	6	3	13	20	24	
Soil Science . . . . .	19	7	8	4	3	12	30	23	
FHDO . . . . .	49	12	3	7	-	2	52	21	
Total	No. . . . .	290	135	105	119	39	145	434	399
	Per cent . . . . .	66.82	33.83	24.19	29.82	8.98	36.34	99.99	99.99

\*Including two staff from the Office of Student Affairs.

†In Department of Agricultural Engineering in 1963.

‡In Department of Chemistry in 1963.

ratio of 1:10 is considered quite liberal. Steps might well be taken to reclassify most of the research assistants and assistant instructors into graduate assistants or transfer them into nonacademic categories.

Although some departments may be overstaffed, there are other departments and areas, notably Agricultural Economics, Humanities, Chemistry, Food Science, Mathematics, Physics, Zoology, and Sociology, where further staff development and upgrading is essential. Furthermore, there is still too large a proportion of B.S. degree holders on the academic staff with no advanced training (Table 23). In all cases, as leaves of absence, retirements, and resignations develop, care must be given to keeping the "pipe lines" full of high-quality staff replacements.

Although most of the responses from department heads and administrators indicated staff development as one of the major accomplishments of the UPCO program, increasing recognition was given to the fact that staff development consists of much more than advanced degrees and includes development of philosophies, programs, and priorities in education and research relevant to the needs of the Philippines.

TABLE 24. Distribution of Academic Staff by Rank and Department, 1963 and 1973

Department	Research Assistant		Assistant Instructor		Instructor		Assistant Professor		Associate Professor		Professor		Total	
	1963	1973	1963	1973	1963	1973	1963	1973	1963	1973	1963	1973	1963	1973
Agricultural Botany . . . . .	11(3)*	2	3	-	16(3)*	19(7)*	4(1)*	7	-	3(1)*	1	-	35(7)*	31(8)*
Agricultural Chemistry . . . . .	-	2	3	1	28(13)*	12(7)*	-	11(2)*	-	-	2	2	33(13)*	28(9)*
Agricultural Communications . . . . .	1	1	2	-	7	8(2)*	2(1)*	3(1)*	1	2(1)*	-	1	13(1)*	15(4)*
Agricultural Economics . . . . .	5	2	7(1)*	2(1)*	8(2)*	9(3)*	5	9	-	-	-	2(1)*	25(3)*	24(5)*
Agricultural Education . . . . .	-	2	4	-	21(3)*	15	5	14†	5(1)*	3(2)*	-	3(1)*	35(4)*	37(3)*
Agricultural Engineering . . . . .	1	1	3	1	27(3)*	15(8)*	2(1)*	5	-	2	2	-	35(4)*	24(8)*
Agronomy . . . . .	13(2)*	3	2	1	40(11)*	16(4)*	4	25(4)*	1	3	2	4(1)*	62(13)*	52(9)*
Animal Science . . . . .	-	8	-	-	27(3)*	12(2)*	4	14(3)*	2	5(1)*	1	1	34(3)*	40(6)*
Applied Mathematics‡ . . . . .	-	-	-	-	-	8(1)*	-	6	-	1(1)*	-	-	-	15(2)*
Entomology . . . . .	3	-	5(1)*	-	12(2)*	8(5)*	2	10(1)*	-	2	1	1(1)*	23(6)*	21(7)*
Food Sciences§ . . . . .	-	-	-	-	-	2	-	2(1)*	-	-	-	1(1)*	-	5(2)*
Home Technology . . . . .	2	-	2	-	9	6(1)*	3(1)*	5	-	3(1)*	-	-	16(1)*	14(2)*
Humanities . . . . .	-	-	6(1)*	-	13(1)*	20(3)*	1	4	1(1)*	-	-	1	21(3)*	25(3)*
Plant Pathology . . . . .	4	4	-	1	12(3)*	3(2)*	4	14(1)*	-	1	-	1	20(3)*	24(3)*
Soil Science . . . . .	12	3	2	1	13(3)*	7(4)*	2(1)*	10(4)*	-	2(1)*	1	-	30(4)*	23(9)*
FHDO . . . . .	-	3(2)*	39	-	12	14(4)*	1	3(1)*	-	-	-	1	52	21(7)*
Total No. . . . .	52(5)*	31(2)*	78(3)*	7(1)*	245(50)*	174(53)*	39(5)*	142(18)*	10(2)*	27(8)*	10	18(5)*	434(65)*	399(87)*
Total Per cent . . . . .	11.98	7.77	17.97	1.75	56.45	43.61	8.98	35.59	2.31	6.77	2.31	4.51	100	100

\*Figures in parentheses refer to number of academic staff on leave-fellowship, scholarship, etc.

†Including two staff from the Office of Student Affairs.

‡In Department of Agricultural Engineering in 1963.

§In Department of Chemistry in 1963.

The real measure of staff development and maturity lies in the accomplishments of the faculty in instruction, research, and extension education and in the faculty's responsiveness to the agricultural problems of the Philippines. Cooperative working relationships between the visiting professors and graduate assistants with their Philippine counterparts provided the catalytic effect to bring about these qualities of staff development and leadership. The daily contacts and interactions in the laboratories, field experiments, classrooms, extension meetings, plus seminars and informal discussions, provided mutual stimulation and exchange of knowledge and experience between visiting professors and graduate students and the UPCA staff. This team effort was one of the key elements of the UPCA model. The mutual and joint efforts paid the dividends on the investment.

Evidence for the maturity of the staff is provided by the fact that in the final two-year grant for the UPCA program, it was decided that funds for training of Filipino graduate students would be made available only to support the local Ph.D. program. The funds would be used for fellowships for selected staff members who were Ph.D. candidates to go abroad for one semester or for one academic year of advanced courses that were not readily available at Los Baños. They would then return to Los Baños to complete the requirements for the Ph.D., receiving the degree from the University of the Philippines.

As one looks at the improvement in level of training, competence, and maturity of the staff during the past ten years, it is clearly evident this was one of the major contributions of the entire UPCA program. The UPCA reaped its greatest advantages from the young staff members who were sent abroad for their course work and returned to Los Baños for their thesis research, and from the mutual stimulus, interactions, and relationships between the visiting professors, consultants, and American graduate assistants, and the Filipino faculty and graduate students.

### *Higher Quality of Instruction*

Several steps have been taken during the past ten years, through the College administration and the Office of the Director of Instruction, to upgrade the quality of instruction in the several departments of the U.P. College of Agriculture. Teaching seminars have been held, some courses have been reorganized, new courses have been added, especially at the graduate level, and teaching materials have been improved through the preparation of syllabi, manuals, laboratory exercises, visual aids and other teaching materials. Some new textbooks have been written and published. The administration has offered encouragement and recognition for better teaching by members of the faculty.

The undergraduate curriculum has been studied extensively by faculty committees and has been revised. A new five-year undergraduate curriculum was initiated in 1967. An important feature of the new curriculum is the opportunity given to the student to choose, for the final requirement for graduation, among three options—thesis, special problem, and major practice. Revised five-year curricula leading to B.S. degrees became effective in Agricultural Chemistry in 1969–1970 and in Agricultural Engineering in 1968–1969; and new curricula in Agricultural Education and Agricultural Extension became effective in 1969–1970. A revised four-year curriculum was initiated in Home Technology in 1969–1970 to prepare students for teaching, research, or extension in the fields of foods, family development, or home management. Additional B.S. degree programs were to be effective with the first semester 1972–1973 in Biology and Applied Mathematics.

An M.S. Agri-business curriculum was initiated in 1966 cooperative between the Department of Agricultural Economics and the U.P. College of Business Administration.

Increased emphasis has been given to instruction and research in Food Science and Technology and a separate department was established in 1971–1972.

Senior and experienced staff members have been urged to teach the more important elementary courses and laboratories. Larger numbers of the faculty are better prepared for teaching than was true earlier. Greater experience of the staff in research has contributed to better teaching, with more instruction based on experience and local knowledge rather than from textbooks written in temperate countries.

New facilities and improved classrooms, equipment, and laboratories have provided a much better environment for instruction, both for the students and the faculty.

While these efforts have had a favorable effect on the quality of instruction, many of the students are still critical, with some justification, of the instructional programs available to them. They indicate that too many undergraduate courses are being taught by young staff members with inadequate preparation, that lecture notes and other teaching materials are not being updated in many cases, and that teaching materials largely are taken from textbooks written and published in other countries. Some department chairmen still follow the practice of shuffling courses and making teaching assignments among staff members only a day or two before each semester starts. As a result, a staff member may learn that next week he will be teaching a course that he has never taught before, and perhaps one in which he is not interested and properly prepared.

As one administrator put it, "Teaching is relegated to secondary importance to research and must receive a higher priority." This is a

common complaint in many countries, especially in those where staff members have dual responsibilities in instruction and research. Certainly, good teaching must be recognized fully, along with research and other responsibilities, in recommendations for promotions in rank and salary.

With the exception of a few departments, greater emphasis gradually is being given to graduate-level courses in recent years. In some cases, graduate programs may have expanded somewhat more rapidly than staff competency would justify. There may have been too much proliferation of courses, with the result that enrollments are low in many of them, making such courses relatively expensive. This problem is recognized, however, and courses with small enrollments will be dropped and perhaps others will be offered in alternate years.

### *Research to Meet the Needs of the Philippines*

There has been rapid expansion in the research output of the U.P. College of Agriculture, paralleling the staff development program. But even more important has been a marked improvement in the quality of research. Greater emphasis than ever before is now being given to problem-oriented research directed at increasing food supplies in the Philippines. Especially noteworthy are the development by plant breeders at the College of adaptive, high-yielding rice varieties that compare favorably with the best IRRI varieties, expanded investigations by crop scientists on high-yielding, disease-resistant varieties in corn and other feed grains, breakthroughs in the production of tomatoes and other vegetables, significant research on irrigation and water management, and important contributions in poultry nutrition, food processing, and fruit and livestock production. In several of these areas research was initiated by visiting professors and graduate students in cooperation with UPCA staff under the UPCO program, and the projects are being continued by Filipino scientists. Cooperative relationships with other government agencies and private industries have been developed and continue to be of great significance.

One of the most encouraging developments has been the favorable effect of the "seed money" provided under the UPCO program for thesis research at the UPCA upon grants that have been received by the College from the NSDB, NRC, NFAC, and other government agencies. A large number of significant research programs were initiated through support for thesis research at Los Baños, and the results have provided a sound basis for proposals dealing with agricultural problems of the Philippines. Grants have resulted that provide research funds for young staff members. Timely and substantial grants resulting from the catalytic effect of UPCO funds have been received

for research on pastures and forages, multiple cropping, vegetable production, and poultry nutrition (Table 26).

The first few years after completion of graduate studies are especially critical for building and maintaining the morale of young staff members, so these grants have been especially helpful in providing necessary support for equipment, supplies, and other operational costs of the research programs.

The College staff gradually has increased its involvement in research that cuts across disciplinary-departmental lines with an expansion and adaptation to field conditions. Investigators representing different disciplines have integrated and coordinated research efforts on the multifaceted aspects of a particular commodity, including its production, development, processing, marketing, and socio-economics and communications aspects. Examples are beef cattle production and grassland development studies, multiple cropping program, and intensified production programs in rice, corn, and vegetable crops. The interaction and cooperation of specialists from different disciplines on research problems of common interest has provided a most encouraging team approach that hopefully will be expanded into other areas.

The Director of Graduate Studies at Los Baños and the Cornell Project Leader in 1970 compiled a list of theses, publications, and other educational materials resulting from the UP-Cornell Graduate Education Program. This compilation is summarized in Table 25 and shows that a wealth of scientific and educational information has been accumulated under the UPCO program. Substantial additions to these lists of publications were made in 1971 and 1972. This summary reflects a very large amount of new research initiated by visiting professors and graduate students along with expanded investigations by the UPCA faculty resulting from additional funds made available by the Ford grants.

In its report, "Directions, Designs for Decisions in the Seventies," the UPCA Task Force in 1971 concluded that to make the research program more responsive to national needs, first priority should be given to projects:

- a. relevant to the national programs on livestock production and marketing and the associated fields of pasture management, feed grains and forage production;
- b. designed to solve problems of harvesting, storing, processing, and other marketing functions pertaining to food grains;
- c. on the social aspects of the food and population problems, specifically family planning and the response to rural organizations to innovation; and
- d. related to environmental problems such as pesticide residues and soil conservation.

These are important priorities and illustrate a recognition by the UPCA of some of the significant problems facing Philippine agriculture.

TABLE 25. Theses and Publications Resulting from UP-Cornell Graduate Education Program\*

Theses by UPCO participants	
Ph.D. ....	39
Ph.D. in progress .....	7
M.S. ....	42
Theses related to UPCO Program	
Ph.D. ....	3
M.S. ....	37
Books published .....	4
Books in preparation .....	11
Manuals published .....	15
Monographs and bulletins .....	4
Scientific articles in International Journals .....	43
Scientific articles in Philippine Journals .....	88

\*Summary through 1970

Financial support for research at the U.P. College of Agriculture in 1971-1972 is shown in Tables 26 and 27. The large number of research grants and total support are especially noteworthy, especially in view of the fact that, with the exception of the item for rice and corn production, all of these have been obtained since 1963. It also should be noted that the total of funds for research from grants is more than three times the U.P. research budget in 1971-1972.

#### PHILIPPINE COUNCIL FOR AGRICULTURAL RESEARCH (PCAR)

The President of the Republic of the Philippines issued a Presidential Decree in October, 1972, which created the Philippine Council for Agricultural Research (PCAR). For administrative purposes, PCAR is attached to the Department of Agriculture and Natural Resources. It has been granted full responsibility to define the goals, purposes, and scope of research necessary to support the progressive development of agriculture, forestry, and fisheries for the nation on a continuing basis. Using the basic guidelines of relevance, excellence, and cooperation, PCAR will coordinate the national agricultural research program based on a multi-disciplinary, interagency, and systems approach for the various component commodities. It will also establish a system of priorities and provide the mechanism for assessment of progress and updating of the national agricultural research program.

This new Philippine Council for Agricultural Research is charged with the responsibility of establishing and providing support for a national network of centers of excellence for the various commodity re-

search programs by drawing upon the facilities of cooperating universities and colleges and other research agencies and linking these closely with selected PCAR research centers and stations. To do this and implement the national agricultural research program which it will formulate, PCAR is granted the power and authority to call on any ministry, bureau, office, agency, state university or college, commodity institute, and other instrumentalities of the government for assistance in the form of personnel, facilities, and other resources as the need arises in the discharge of its functions. Research personnel, facilities, and other resources which belong to universities, colleges and commodity institutes shall be harnessed on a contract basis to support the PCAR agricultural research program.

In the early organizational phases of PCAR, many of the key positions were filled by staff members of the UPCA. This is good recognition of the quality of the scientists at Los Baños, but it remains to be seen in future months and years how the agricultural research responsibilities of the College will be affected by PCAR.

#### FUTURE OF UPCA RESEARCH

Based on progress made over the past 10 years, one can be optimistic about the future research program of the UPCA if: (a) the well-trained research scientists can be retained; (b) adequate funding can be obtained and maintained; (c) vigorous leadership is provided in the Office of the Director of Research; (d) a system of establishing research priorities relevant to the needs of the Philippines is continued; and (e) if progress continues to be made in approaching major problems on an interdisciplinary basis, and in cooperation with other national agencies.

#### *Expansion in Teaching and Research Facilities*

With more than a dozen major new buildings for teaching, research, and administration, blending with a few remaining old ones, along with new faculty houses, student dormitories, and improvements in utilities and services, and with new campus roads and walkways, the University of the Philippines at Los Baños in 1972 was a beautiful, functional campus with few, if any, equals among agricultural universities in Southeast Asia. These new buildings and equipment provide classrooms and teaching and research laboratories that were only dreams in 1962 when the campus development plans were being formulated.

#### NEW BUILDINGS AND EQUIPMENT

In the early stages of the campus development program, Cornell was requested to provide a visiting staff member whose primary re-

TABLE 26. Research Grants to UPCA, 1971-1972\*

Research Grants	Amount	
<i>National Science Development Board</i>		
Estrus synchronization in swine.....	P 14,360	
Distribution of different plant parasitic nematodes associated with the citrus decline in the Philippines.....	14,500	
Nutrient requirements of poultry in the Philippines.....	31,935	
Management and nutrition of ducks.....	51,225	
Turkey production.....	34,000	
Phenotypic and genotypic parameters of some economically important traits in swine.....	10,500	
Livestock marketing.....	86,500	
Further development, multiplications and performance testing of an NSDB-UPCA developed strain of pigs and various purebreds.....	145,235	
Development of the strain in S.C. White Leghorns for high egg production, livability and hatchability.....	54,000	
Chemical analyses and digestion coefficients of Philippine feeds.....	23,000	
Integration of adult-farmer education program in rural development.....	21,780	
Management and nutrition studies on feed resources for ruminant livestock.....	255,170	
Sunflower research.....	4,750	
<b>Total.....</b>	<b>P746,955</b>	<b>P 746,955</b>
<i>National Food and Agriculture Council</i>		
Rice and corn production program.....	P 906,000	
Intensified corn production program.....	152,000	
Research and extension program in vegetable crops.....	227,000	
Downy mildew action program.....	39,000	
Corn, Sorghum and other upland crops production		
Rockefeller Foundation.....	90,000	
Philippine Counterpart.....	<u>235,000</u>	325,000
Forage pasture research.....	97,000	
National program on multiple cropping.....	30,000	
Rice applied research & training program.....	91,000	
<b>Total.....</b>	<b>P1,867,000</b>	<b>P1,867,000</b>
<i>National Research Council of the Philippines</i>		
Studies in Agricultural Chemistry.....	P 38,000	
Studies in Entomology.....	100,200	
Studies in Agricultural Botany.....	100,270	
Studies in Animal Science.....	170,050	
<b>Total.....</b>	<b>P408,520</b>	<b>P 408,520</b>

\*Annual Report 1972, University of the Philippines, College of Agriculture

TABLE 26. Research Grants to UPCA, 1971-1972 (continued)

Research Grants	Amount	
<i>Brought forward</i> .....	P408,520	P 408,520
<i>Other Miscellaneous Grants</i>		
Philippine Virginia Tobacco Administration .....	P290,000	
Philippine Sugar Institute .....	65,000	
United Nations Children's Fund (UNICEF) .....	6,500	
IRRI Support for multiple cropping .....	34,720	
International Atomic Energy Commission .....	2,860	
UP-Cornell Graduate Education Program		
For returning Ph.D.'s .....	19,146	
Coordinated pasture research program .....	50,000	
Coordinated research on multiple cropping .....	29,435	
Economics of ground water irrigation .....	9,020	
Private chemical companies .....	32,004	
Total.....	P538,685	P 538,685
Grand Total .....		P3,561,160

sponsibility would be to assist in expediting plans for the major buildings. Since there were capable Philippine architects working on the design of the buildings, it was felt that a scientist experienced in the planning and use of modern teaching and research facilities would be most helpful to the staff of the UPCA. Professor J. E. Knott served for three years in this capacity beginning in August, 1964.

The World Bank suggested that the visiting professor check carefully to be sure that the laboratory and classroom areas were adequate for the projected class enrollments, and that assistance be given in the planning of the layouts of the research and teaching laboratories. Furthermore, the Bank was interested in keeping the size of the buildings and their cost within the limits which had been proposed by the College. A well-qualified project manager, Mr. J. J. Flor, was employed by the College and placed in charge of the campus development program.

TABLE 27. U.P. Research Budget, 1971-1972\*

Items	Amount
Salaries.....	P 995,055
Wages .....	56,647
Travel .....	17,500
Supplies and materials .....	65,000
Sundry .....	13,915
Total.....	P1,148,117

\*Annual Report 1972, University of the Philippines, College of Agriculture

The campus plan that had been prepared earlier was closely scrutinized and many modifications were made. Space analyses and detailed floor plans were made by staff committees for each of the buildings and lists of equipment for each room in each building and estimates of costs were prepared. These plans and estimates were presented to representatives of the World Bank in the spring of 1964.

All of these things required long hours of hard work from many members of the staff, especially the chairman of the Technical Committee, Dr. F. A. Bernardo. The Los Baños staff did a really remarkable job in developing the schematics for the buildings and the lists of equipment. Contracts for the services of architects were signed in November, 1964. Highest priorities were given to construction of major buildings for biological sciences and for physical sciences.

There were many problems to be dealt with, such as determination of student loads and improvement of room layouts, that involved much time with the architects. The first sets of preliminary drawings for the biological and physical sciences buildings evoked a comment from the World Bank that "the design of the two science buildings does not give the impression that the designer thoroughly knows and understands what these buildings are called upon to do and what it requires in facilities, space, and equipment to do it."

When the bids started coming in late in 1966, they exceeded the estimated costs. The World Bank was concerned about the discrepancies between the estimated costs and the bids that were received. These discrepancies were due in part to a rise of about 30 per cent in construction costs since the estimates were prepared in 1963-1964. Another factor was the lack at that time of enough specific details from departments for the Technical Committee to estimate properly the costs of the many mechanical features that are essential parts of a science building. Thus, when the bids for construction were received, it was necessary to negotiate these with the successful bidders. By the elimination of elevators, central air-conditioning equipment, and other mechanical features and construction items, it was possible in some cases to reduce the costs below the initial bids.

To make room for Biological Sciences, the old building occupied by Agricultural Botany had to be demolished. Botany took up temporary quarters in Agricultural Engineering. Plant Breeding's building was torn down to make room for Physical Sciences and the Plant Breeding staff was crowded into Agronomy's facilities. The Plant Pathology building was demolished to make room for the construction of a new administration building and the staff took refuge in Animal Husbandry's facilities. These were just some of the disruptions that took place over a period of a few years, and it is amazing that any progress was made in teaching and research during this period of time.

The Biological Sciences building was occupied late in 1968 by Plant Pathology, Entomology, and Agricultural Botany. For the first time these important departments had classrooms and teaching laboratories adequate for their needs. Research laboratories, greenhouses, and new equipment were far superior to those that had been available previously. All of these had a favorable, stimulating effect on both the faculty and students.

The Physical Sciences building was scheduled for completion early in 1969, but the contractor ran into financial difficulties and after long delays the building was finally completed late in 1971, when it was occupied by Agricultural Chemistry and Applied Mathematics. By this time, there was little money left for new equipment for this high priority building. This was most unfortunate as Chemistry, Physics, and Mathematics are basic subjects to all other departments in the University.

Other major buildings completed included:

*Los Baños Union* with dining and recreational facilities for students and faculty.

*New dormitories* for men and women fulfilling a long-felt need for better housing for students.

*Agronomy-Soils* with excellent facilities for teaching and research in these important fields.

*Agricultural Engineering* provides offices, lecture halls and laboratories.

*Food Science and Technology* provides the first facilities available at the UPCA for teaching and research in this emerging discipline in the Philippines.

*Administration* houses all of the administrative officers for the University at Los Baños and the College of Agriculture.

*Extension-Communications* provides offices and classrooms for these important programs.

An *Auditorium and Cultural Center* brings an excellent facility to the Los Baños community for large gatherings of students and faculty and for concerts and other cultural events.

An *Infirmery* has brought modern facilities for health services to the community.

Another valuable addition to the campus is a new Continuing Education Center. Funds for this training center were provided by the Ford and Rockefeller Foundations. This fine center provides meeting and conference rooms, dining room, and room accommodations for up to 85 participants in workshops and conferences.

Renovation of the old Soils building provided suitable quarters for the Department of Education, and the Department of Humanities occupied the old Entomology building and eventually was scheduled

to occupy the old Library after it moved to the new building being constructed on funds provided by USAID through SEARCA. The girls' dormitory was renovated for use by the rural high school.

More than 100 new houses and apartments for the faculty, along with a guest house and social center with swimming pool, looking down over Los Baños and Laguna de Bay, provide an attractive living area that adds much to the social environment of the faculty community. Lack of adequate housing and associated utilities had been emphasized in 1962 as one of the most serious problems facing young staff members.

#### COMPUTING CENTER (LBCC)

There was general agreement for a number of years on the need for a computing center at Los Baños for instruction and research purposes. Such a center would effectively serve all units of the Los Baños complex, especially the UPCA, IRRI, and the College of Forestry. Some faculty members found it necessary to travel to Diliman and to other universities in Manila to obtain the services of a computer.

The UPCA administration requested funds for computer facilities in the budget for the renewal of the Ford grant that was to be effective July 1, 1967, and approximately \$100,000 was made available. Experience at Cornell and other universities in the United States had shown many advantages in favor of rental of computer equipment rather than outright purchases. Specialists at Cornell advised rental, but the UPCA administration decided to purchase a used IBM 1620 processing unit, with auxiliary equipment. The equipment was placed in air-conditioned rooms in the Agricultural Economics annex and a director was appointed.

The computer was used by all of the Los Baños units, including IRRI, during its first year of operation for an average of eight hours a day, five days a week. Faculty in Agricultural Economics and Agronomy accounted for more than half of the use by the College. Staff of the Center soon felt the need to train and hire more personnel for programming.

Usage of the computer increased slowly, but there was still room for greater utilization. Frequency of breakdowns increased, reflecting the age and condition of the basic machine. Also, turnover of directors added to the problems. The facilities were expanded in 1969-1970 with installation of two IBM 1311 disc drives which greatly enlarged the memory storage capacity of the computer.

Top priority was given to serving research in the member units of the Los Baños complex with 69 per cent of production run utilized for research. Administrative services utilized 19 per cent of production time and 12 per cent was used for instruction purposes.

Posting of student grades was computerized during the year 1969-1970 for both the Colleges of Agriculture and Forestry. Programs were written to transfer completely the UPCA payroll and accounting systems to the computer.

During the 1970-1971 year, the LBCC was transferred to the Mathematics wing of the new Physical Sciences building, thus solving the problem of congestion that had been encountered previously. Along with the transfer, however, some major problems arose. Part of the trouble was due to power interruptions at unpredictable intervals. Another and more basic problem was the increasing age of the computer resulting in more frequent breakdowns. With no service contract, repair jobs received a relatively low priority from the manufacturer. Sometimes several days elapsed before a serviceman would arrive from Manila to make the necessary repairs.

As a result of the relatively poor, erratic and expensive computer service, some unsatisfied customers transferred their computer jobs to the larger, newer IBM 360 at Diliman; others contemplated such a change.

Steps were taken by the Advisory Committee to correct some of the problems. A service contract was arranged and many parts on the computer were replaced. Unfortunately, the 1620 computer at Los Baños is not compatible with the 360 computer at Diliman. A new director of the Center was appointed, but some complaints continued on the quality of service from the Computing Center.

Increasingly, in spite of problems encountered, members of the faculty and administration have recognized that a good computer is an essential tool for a modern educational and research institution. All graduate students and faculty members in this and succeeding generations need to have a basic knowledge of computers and exposure to their use. To be successful, however, the computer must be in good operating condition at all times; it should be a relatively new and sophisticated piece of equipment; and above all, the operation needs to be managed efficiently.

#### CENTRAL SCIENTIFIC SUPPLY HOUSE (CSSH)

A continuing problem for staff members at Los Baños in the past had been that of getting teaching and research supplies and equipment without long delays through the regular purchasing channels. Thousands of hours have been spent going to Manila to search for supplies needed. Ever since the first visiting professor from Cornell arrived on the scene in 1952, the idea of a central scientific store on campus had been proposed and discussed. It was not until the renewal of the Ford grant on July 1, 1967, however, that funds were available to set up a Central Scientific Supply House (CSSH) on



*This aerial view in 1974 shows the campus of the University of the Philippines at Los Baños after the Five-Year Development Program. Twelve major new buildings for teaching, research, and extension were constructed. (Contrast this with earlier stages of development. See pages 47 and 254.)*



*Agricultural Engineering now occupies this beautiful new building with vastly improved facilities and equipment for its functions in instruction, research, and extension.*



*The last building completed under the College's development program was this magnificent new library completed in 1973. Funds for this building were provided by US/AID through the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA). Liberal support for acquisitions of materials came from the Ford Foundation under the UPCO program.*



*More than 100 new faculty houses such as these were built by the College as a part of its development program under the World Bank loan.*



*One of the houses for visiting professors on the UPCO program. Funds for eleven houses were provided by the Rockefeller and Ford Foundations.*



*Apartments for American and Asian graduate student participants in the UPCO program. Fourteen furnished apartments were provided by the Rockefeller and Ford Foundations.*



*New dormitories for students of the UPCA were built as a part of the development program. This shows one of the units for women.*

campus and to purchase the initial stock of supplies. Cornell University agreed to cooperate and handled all purchases that had to be made in the United States through its purchasing department. It was agreed that charges would be made to departments as supplies were drawn, a revolving fund would be established, and the supply of chemicals and supplies would be replenished periodically with receipts from sales.

Work started in 1968 on construction of the store, stocks of supplies were ordered, and the CSSH was officially opened for business in December, 1968.

Some of the organizational and operation procedures originally proposed proved to be not feasible because of national government and University policies for accounting and auditing. A business management firm in Manila was retained by the Ford Foundation to prepare recommendations for operating procedures for this unit, including forms to be used for transactions and other similar details. Proper operating procedures were developed and the CSSH soon was selling supplies to all UPCA departments and the College of Forestry. The Chemistry department was the heaviest user, but soon other departments—Soils, Botany, Agronomy, Animal Husbandry and others—were heavy users. Faculty members found that it served as a convenient source of supplies and avoided delay and red tape usually associated with requisitioning laboratory and other equipment and supplies through government channels.

Even though the volume of business increased and the CSSH fulfilled a most important function, it was not without problems. Trips to Manila for canvassing prices and purchasing items were made weekly, but sometimes these had to be postponed because no vehicle was available. Some items which could have been obtained locally were imported from abroad. Rather than search out supplies from various sources in Manila, it was often easier for a person to sit in the office at CSSH and order by mail from the catalogs. Such a procedure might be easier, but it was usually more expensive and required a lot more time if supplies were shipped by surface from overseas. Other problems with imported orders included breakage and pilferage, some shipments were lost in transit, and frequently insurance claims were not collected because it took so long to verify them that the sixty-day time limit was exceeded.

Even with such problems, it is necessary to order some things from abroad. But with the termination of the UPCO program and the end of the grace period of the grant on June 30, 1973, it will not be so simple to use services of the Purchasing Department at Cornell in the future. Procedures could be worked out for continuation of Cornell's services, however, if requested by the UPCA. In the last discussions that were held (April, 1972) the CSSH advisory committee was investigating

ways and means of establishing direct business relationships with foreign suppliers. Several options were available: (1) purchase direct through foreign suppliers; (2) through Cornell University; (3) through SEARCA; and (4) through suppliers in Manila. The most important thing is to keep the CSSH operating efficiently.

### *Impact on National Agricultural Development through Extension and Public Service*

One of the most significant developments in recent years in the UPCA has been its role and impact on national agricultural development. This has come about as a result of coordinated efforts of staff members of the College, with visiting professors playing significant roles, with IRRI, APC, NFAC, BPI, and other agencies of the DANR, USAID, and private industries. Adaptive research and field studies have been developed and extension activities have been coordinated to get the results of research into the hands of farmers. Primary emphasis has been given to programs in rice, but similar programs have been extended to corn and other feed grains and food legumes, and more recently into vegetables, pastures and forage improvement, and livestock production.

Getting the College into the mainstream of national agricultural programs has been a slow, but gradual, process with much acceleration during the past 10 years. Courses in agricultural extension by Cornell professors in the 1950's, establishment of the Office of Extension and Publications in 1954 and its successor, the Department of Agricultural Information and Communications in 1962, and the Farm and Home Development Program in 1962, all have contributed to the extension function. They preceded the establishment of a Coordinating Committee on Extension that was appointed in 1963. The responsibilities of this committee, under the chairmanship of Visiting Professor M. C. Bond, were to study existing extension activities and make recommendations for the further development of the extension out-reach of the College. Recommendations made by the Committee became the established policies of the College's extension program.

The position of Director of Extension Education was created in 1964 to parallel the positions of Director of Research and Director of Instruction. Capable leadership in this position made it possible to work effectively through other agencies to enlarge the College's potential for greater assistance in agricultural development in the Philippines.

For the first time, staff members were assigned responsibilities as extension subject matter specialists in 1963-1964. The number and quality of extension specialists have increased and they have worked effectively in many areas, especially in rice, corn, vegetables, and

livestock production, and in those fields related to the production and utilization of these commodities.

#### TRAINING

As increased extension activities emerged at the College, some of its most significant contributions were made through many training programs. In the early stages, training programs in rice production for the farm management technicians of the APC were the main focus, but they grew rapidly into a series of training courses for technicians of the RCPCC, BPI, and PACD.

The College became more actively involved in training of rice production specialists in cooperation with the IRRI. In later years, the College sponsored its training programs jointly with additional agencies, such as the BPI and the NFAC. The College has used a total approach or perspective, including production, crop protection, management, marketing, as well as the social-communications factors. During 1971-1972, in addition to rice production, training programs were established for feed grain production, grain processing, vegetable production, multiple cropping, and intensified poultry and livestock production. These training programs are attended by farmers, farm leaders, rural youth officers, teachers, and representatives of many organizations, especially the various government agencies.

#### AGRICULTURAL COMMUNICATIONS

An important forward step was taken when IRRI and the UPCA entered into a Rice Information Cooperative Effort (RICE) to assemble and distribute up-to-date rice production information. A project leader was employed in Agronomy and information specialists were employed in the Department of Agricultural Information and Communications. An important aspect of the undertaking was exchange of information between the UPCA, IRRI, and all other agencies. The team used primarily mass media but also assisted in the development of training materials for use of personnel in all agencies. A most significant contribution was the preparation and publication of the Rice Production Manual. It covered all phases of rice production from the morphology of the rice plant to the harvesting, threshing, drying, storage, and milling of rice, thus serving a most important function as a basis for instruction in all training programs.

One of the most effective publications developed as a part of the extension phase of the UPCA program was the 1969 edition of "The Philippines Recommends for Rice." With funding provided by NFAC, 45 authors from 14 agencies cooperated in preparation of the first edition. It was an instant success and received favorable comments throughout the world and soon was used in many countries as a pro-

duction guide and training reference. The second edition in 1970 was even more widely distributed.

As a part of the corn production extension program, "The Philippines Recommends for Corn 1970-71" was published and distributed. "The Philippines Recommends for Vegetables 1972-73" was published recently, and similar publications were proposed for other crops.

Through the cooperation of the Department of Agricultural Information and Communications (later changed to Agricultural Communications) expanded use of all types of news media contributed greatly to the extension function of the College. The UPCA Farm and Home News, Upland Crops Newsletter, Livestock and Poultry Research News, and the campus radio station are examples of methods used for the dissemination of information on agricultural research. Extensive use also has been made of bulletins, brochures, circulars, leaflets, and other extension publications.

#### APPLIED RESEARCH AND EXTENSION PROGRAMS

Building upon the activities of previous visiting professors in extension (M. C. Bond, A. E. Durfee, and H. R. Ainslie), Professor Reeshon Feuer was unusually effective in his four and one-half year period of service in helping to bring about coordinated efforts of the College, IRRI, many national agencies and private industry.

The Unified Rice Applied Research, Training, and Information Project (URARTIP) was initiated and has been most effective in the coordination of national and private agencies and associations. Thousands of field trials and demonstrations have provided means of evaluation of new high-yielding varieties from IRRI, the BPI, and the College. Not only has this procedure been effective in rate of adoption of new varieties by farmers, but it also utilizes knowledge on fertilizers, insecticides, herbicides, and other inputs necessary for their acceptance by the Filipino farmer.

The rice Mini-Kit was developed in 1968 and has been an outstanding success as a unique and powerful extension teaching vehicle for rice extension workers. Thousands of these units of "packaged technology" have been used in the Philippines, and their use has spread to other countries, notably Ceylon and India. Further, the Mini-Kit concept has spread rapidly in the Philippines to nearly all other crops, including vegetables.

Table 28 shows the adoption of high-yielding rice varieties during a period of six years, as presented by Professor Feuer in his terminal report. The URARTIP project has contributed greatly to the rapid adoption of the new rice varieties by Filipino farmers.

TABLE 28. Percent, Yield, and Hectarage Planted to High-Yielding Varieties (HYV) of Rice in the Philippines\*

Fiscal Crop Year	Area Planted (Thousands of Hectares in Program Areas)	Percent of Total Planted	National Average Yields; cavans (44 kg.) per hectare	
			HYV	ALL
1966-67 .....	83	3	-	-
1967-68 .....	390	15	75	43
1968-69 .....	606	21	72	43
1969-70 .....	928	35	69	49
1970-71 .....	1,348	49	66	52†
1971-72 .....	1,622‡	63	61§	56

\*Source: NFAC-APC: Programmed Areas.

†Of the 1,148 million hectares of HYV rice harvested during the 1970-71 crop year the average yield was 66 cavans per hectare compared with a yield of 50 cavans for the 345,000 hectares of "Former Seed-board" varieties and 34 cavans per hectare average for the 915,000 hectares of "other" varieties harvested.

‡Of the 1.622 million hectares of HYV rice planted during the 1971-72 crop year 1.095 million hectares (77 per cent) were irrigated lowland and 527 thousand hectares were rainfed lowland (diked) (45 per cent). Totals for irrigated lowland were 1.419 million hectares and 1.166 million hectares for rainfed.

§Of the 1.014 hectares of irrigated (transplanted) HYV rice harvested during the 1971-72 crop year, the average yield was 65 cavans per hectare, compared with an average yield of 52 cavans per hectare from 0.420 million hectares of HYV grown rainfed (diked, transplanted).

||Data for 1971-72 crop year supplied in 1973 by R. Feuer from the NFAC annual report and rice status mimeographed summaries.

The UPCA also has taken the leadership in extension education to expand production of other basic food crops through the Intensified Corn Production Program and the Upland Crops Program.

#### STAFF DEVELOPMENT FOR EXTENSION LEADERSHIP

From this review of accomplishments in cooperative extension and applied research projects in the food crops, it is clear that great influence was exerted by the visiting professors in their work with Philippine staff colleagues. Much stimulation and assistance was given to the UPCA staff to accept national extension and on-farm applied research responsibilities for their area of subject matter and to initiate leadership programs with the appropriate national agencies. As a whole, this has been one of the most significant and satisfying developments involving the coordinated efforts of the UPCA with IRRI, APC, NFAC, BPI, and other agencies of DANR, all working together with USAID and private industries to develop and coordinate strong production programs in rice, corn, and other basic food crops. In spite of many constraints, tremendous progress has been made.

#### *Improvement in Library Holdings and Facilities*

Among many important accomplishments of the UPCA program during the period 1963-1972, one of the most significant is the im-

provement in the quality and quantity of the materials in the library collection at Los Baños which was made possible through the generous support of the Ford Foundation in its budgetary allocations. For the first several years visiting professors and graduate assistants, without exception, referred to great difficulties in locating needed reference materials in the UPCA library. From about 1967 on, however, almost every one of the visiting scientists began reporting that he could now get access to all essential literature needed for his teaching and research and that of his students.

In the early phases of the program, a goal of 100,000 volumes, consisting of 50 to 60 per cent serials, in the library by 1972 was established. At that time the library had 30,000 volumes. If accomplished, this would provide a library of about one-quarter the size of the Mann Library at Cornell.

In his work as a consultant on library development, Professor Whiton Powell developed a procedure for handling all orders for books and serials in his office in the Mann Library at Cornell, operating through Cornell's purchasing department. Rapid progress was made in obtaining new acquisitions and in bringing about changes and improvements in the UPCA library after the appointment of a trained librarian, Miss Salvacion San Pedro, in 1965.

In the 1965 annual report for the UPCA, improvement of the library was recognized:

"As never before in the history of the College, the library is receiving ample support for the purchase of books, serials and much-needed equipment. Largely as a result of support from the UPCA Graduate Education Program, the library collection marked a tremendous growth with the addition of 4,018 books bringing the College's book collection to 32,610 volumes. The UPCA project was the source of 3,098 books or 77 per cent of the new acquisitions. Some 325 books or 8 per cent were purchased with U.P. book funds."

An indication of growth is shown by the summary of materials in the UPCA library, 1971-1972, as presented in the 1971-1972 annual report of the U.P. College of Agriculture (Table 29) and by Figure 2.

Although the total goal of 100,000 volumes was not reached, there was a substantial increase in acquisitions, averaging about 10 per cent

TABLE 29. Materials in UPCA Library, June, 1972

Materials	Total
Books .....	59,886
Pamphlets .....	2,377
Bound periodicals .....	9,155
Theses and Dissertations .....	3,135
Serial Titles .....	2,772
Microfilms .....	394
Other (maps) .....	285

per year, and the goal of 40,000 books was more than reached. Several factors combined to upset the development plan: (1) worldwide inflation drastically increased the subscription price of international journals and cost of books; (2) for those things bought on peso funds, devaluation of currency within the Philippines in 1970 reduced the purchasing power of the peso by 40 to 50 per cent, and (3) the Philippine Congress repeatedly failed to approve increased appropriations for acquisitions for the U.P. libraries. Thus, by the end of 1971 the College was no longer able to purchase even current issues of some journals on its U.P. funds. During the year 1970-1971, subscriptions to 200 journals were dropped because there was not enough money in the budget with which to purchase them. The University administration at Diliman continued its policy of withholding 10 per cent of the library fees collected from Los Baños students to cover "overhead costs," adding further to the financial problem.

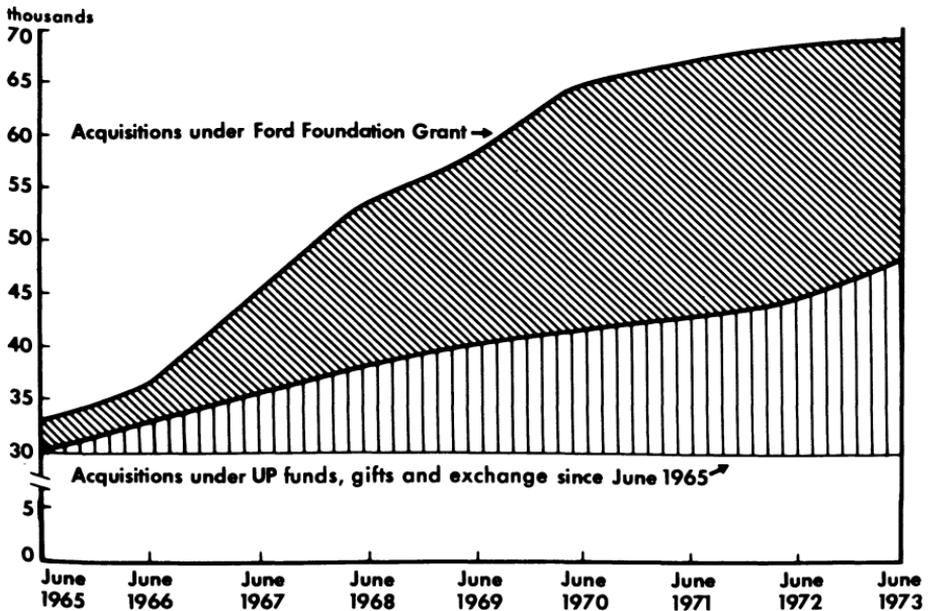


Figure 2 Growth of the UPCA Library based on yearly increases in number of volumes acquired.

#### LIBRARY STAFF DEVELOPMENT

With the appointment of Miss San Pedro as librarian, the UPCA library had excellent leadership and for the first time a person trained in librarianship. But only one or two other members of the staff had been trained in library science. To assist in correcting this situation, Miss Leonora Gregorio was given an UPCO fellowship in 1967 for

graduate study at the University of Pittsburgh. She successfully completed all requirements for the Master of Library Science in 1968. Before returning to the Philippines, Miss Gregorio studied libraries at Cornell, Pennsylvania State University, Ohio State University, Purdue University, University of Illinois, Rutgers University, and the USDA library.

Further progress in staff development was made through provision of scholarships for two other members of the staff to pursue graduate studies at the U.P. Institute of Library Science at Diliman.

#### NEW LIBRARY BUILDING

In the original five-year development program a modest amount of funds was allocated for renovation of the UPCA library building. With the location of the Southeast Asian Ministers of Education Secretariat (SEAMES) program in agriculture at Los Baños, however, discussions were initiated on possibilities of obtaining funds for a completely new library building. Since the SEAMES Center was for graduate study and research in agriculture (SEARCA), the new library would function effectively for both SEARCA and the UPCA.

With substantial assistance from Professor Powell, plans were developed for a new library with 155,000 book-stack capacity and for 600 readers. The plans were flexible so the capacity for books and readers can be altered simply by providing shelving and seats in different proportions. About 300 carrels are provided to take care of special needs of graduate students and faculty. Air conditioning throughout the building will preserve the library's valuable collection of books and other materials and will encourage students and faculty to use the library.

SEARCA's plan to build the new library became a reality in 1969 with a commitment by USAID of \$1 million to underwrite the project. Construction was initiated late in 1970 and the fine, new building was occupied in 1973. It is a real credit to the College and associated units at Los Baños.

#### *Preparation of Textbooks*

Recognizing the need for textbooks written by Filipino teachers and scientists, based on information from the Philippines and other Southeast Asian countries, funds were provided under the UPCA Program for writing and publishing of new textbooks. This activity is administered through the UPCA Textbook Board which was organized in January, 1968. This Board seeks to: (1) encourage the writing of textbooks and teaching materials, such as syllabi and laboratory manuals for agricultural colleges and high schools in the Philippines; (2) publish these items; and (3) make these materials easily accessible at a price within the reach of the average Filipino student. Through

its editorial staff, the Textbook Board is responsible for editing, publishing, and promoting the sales of its books and other materials not normally handled by the Department of Agricultural Communications.

This program started off very satisfactorily with four books published in 1968 and 1969. These were:

*Vegetable Production in Southeast Asia*, edited by J. E. Knott and J. R. Deanon, published in January 1968.

*Agricultural Marketing in the Philippines*, by L. B. Darrah and F. A. Tiongson, published in January 1968.

*Rural Asia Marches Forward: Focus on Agricultural and Rural Development*, by C. W. Chang, published in April 1969.

*The Science and Practice of Swine Production: With Emphasis on Philippine Conditions*, by J. A. Eusebio, published in August 1969.

In addition a paperback, *Vegetable Training Manual*, edited by Ruben L. Villareal and D. H. Wallace, was published in 1969.

Several additional manuscripts were not favorably considered by their readers (critics) and were returned to their authors. During the next three years and up to termination of the UPCO program, no other books were published. A large number of manuscripts, however, were in various stages of preparation for possible publication. Some of the proposed titles are: Biochemistry of Proteins and Amino Acids; Extension Education Administration; Sociological Dimensions of Development; Poultry Nutrition and Management; Plant Diseases: With Special Reference to the Philippines; Beef Cattle Husbandry; Carabao Husbandry; Pasture and Forage Grasses for the Philippines; Teaching Vocational Agriculture in the Philippines<sup>1</sup>; Agricultural Microbiology; Extension Education for Agricultural and Rural Development; Major Tropical Fruits in Southeast Asia.

Lack of suitable textbooks continues to be one of the serious limitations to higher education in the Philippines. The UPCA has an excellent group of professors, many of whom are top experts in their fields. Preparation and publication of additional textbooks, syllabi, and manuals in areas in which the professors have special expertise would greatly benefit students, raise the stature of the institution, improve the personal recognition and stature of the authors, and contribute to more rapid agricultural development in the Philippines.

### *ACAP Improves Agricultural Education*

It has been very encouraging to observe the successful growth and development of the Association of Colleges of Agriculture in the Phil-

<sup>1</sup>Published in 1973. Edited by Dolores P. Barile, Harold R. Cushman and Severino R. Santos, Jr.

ippines (ACAP) since its organization in 1964 through the efforts of Dean Umali and his colleagues of the UPCA. Starting with twelve institutions, it is now a viable entity of eighteen members serving as a catalyst for improvement of agricultural education in the Philippines. In its earlier years, ACAP was supported financially through the UPCO program and the UPCA, but later its support has been directly from the Ford Foundation in Manila.

Many of the current activities of ACAP are led by UPCA staff members, but there has been a concerted effort to hold meetings at each of the member schools. The executive committee, which is composed of the heads of all member institutions, guides its program activities through an executive secretary.

The Association assists in the improvement of research and teaching capabilities at the member institutions through its sponsorship of workshops on many subjects, including agronomy, animal science, engineering, home economics, and library affairs. Seminar-workshops on extension administration have been held to strengthen the professional proficiency of extension administrators in developing and implementing extension programs. Special seminars on marketing have been conducted at different locations to provide methods and sources of information for teaching courses in agricultural marketing.

Through the ACAP secretariat, the UPCA library sends to member institutions its list of new acquisitions, the Philippine Agriculturist, and lists of books recommended by UPCA faculty members as basic texts. Surveys of ACAP member libraries have been made to determine strengths and weaknesses.

Major emphasis has been given to upgrading the faculty competence of ACAP member institutions. For example, 28 staff members of ACAP colleges were enrolled at the UPCA in 1970 for M.S. degree programs on U.P. graduate teaching fellowships and upland crops graduate assistantships. Others are given partial scholarships covering living allowances, books, tuition and fees. As part of ACAP's program, 10 scholars were pursuing their Master's degrees in agricultural business management in 1972 at the University of the Philippines. Through this advanced training, the ACAP envisions faculty leaders who will conduct academic programs in their respective institutions to spread the concepts of agricultural business management for more effective agricultural development in the country.

Beginning in 1972 a monthly newsletter, the ACAP Communicator, serves as a communication link between member institutions. It reports information on extension, instruction, and research useful to ACAP institutions and helps to motivate them to consider new methods, techniques, ideas and outlook for improving agricultural education in the Philippines.

The new Asian Association of Agricultural Colleges and Universities was organized in 1972 at meetings held in Los Baños and Baguio City. This new organization is patterned after ACAP, but with a regional, international perspective. One of its projects is to stimulate national groups similar to ACAP. Other objectives include mechanisms for exchanges of scientific information, graduate students, scientists, and teachers.

*Benefits to the U.P. College of Agriculture  
and the Philippines—as viewed by Filipinos*

STATEMENT BY DR. D. L. UMALI

The benefits of the cooperative relationships of the UP-Cornell Graduate Program were stated quite clearly by former Dean and Vice-President D. L. Umali in an interview in April, 1972 in which he said:

“I think the most important contribution of this relationship between Cornell University and Los Baños is the training of people for leadership not only for the College campus, but leadership that helps the country in its overall agricultural development. I think what is most significant is the role the Cornell program had in training people for leadership to develop programs and activities so that one day they could be on their own. Because of the leaders they have trained, I think it is with great satisfaction that the Cornell professors will be leaving the campus with the feeling that everything will be in good hands.

“Look at the key programs of agricultural development in the Philippines. All of the key leaders of these programs—those dealing with vegetables, corn, rice, and livestock—and many others are from Los Baños. . . . I think it is very, very important that the leaders have the proper outlook, proper balance of work, with a feeling and commitment for the rural people.

“I think the second significant impact of this program is the development of what you call the team spirit of people working together in an interdisciplinary team, or task force. This team effort has accomplished more than has ever been done before. For instance, you have the corn breeding program—the professors from the different departments are lining up together working in research and extension.

“The third important impact of this relationship between Cornell and Los Baños is the new philosophy that the College of Agriculture should not be an intellectual island remote from the people, but the campus always should be close to the people. The College now is so involved with many rural and farming activities which really never happened before. I think this new attitude, this new philosophy, is very important.”

In further comments on his evaluation of the graduate student component, involving both Filipinos and Americans, Dr. Umali had this to say:

"What really may be called imaginative and innovative in the new graduate program between Cornell and Los Baños was the idea whereby the Philippine students go to Cornell to pick up many of their graduate courses and then come back to the Philippines to do their thesis research on problems of real priority to the country. We feel this graduate program has particular relevancy to the development needs of the Philippines. This is the way it should be for developing countries. With this kind of a program, the student does not lose track of his own country, and he has a chance to go back to renew these relationships and acquaintances and not be totally cut off from his own country. Sometimes when the student does his thesis research in the United States, he has all of the first class, highly sophisticated equipment which is not available in his own country so that when he comes back home he becomes frustrated when he finds that he has ordinary facilities. But with this kind of a graduate program the student accomplishes his thesis research with available facilities in his own institution.

"I think it is also a very good idea for American graduate students to come to the Philippines to do their thesis research. It is nice sometimes for an outsider to look into the problems of the country, contributing a different outlook or a different solution. We like experiences with foreign people coming to our campus because that is always very rewarding and far-reaching. For many persons from outside, there is always something we will learn of his culture, from his way of life, and this promotes better understanding among people."

#### COMMENTS BY DR. G. F. SAGUIGUIT

Another administrator, Dr. G. F. Saguiguit, gave his evaluation of the UPCO program. Dr. Saguiguit was Director of Instruction and primarily responsible for administering the program at Los Baños from its beginning until 1968 when he became Deputy Director of SEARCA. In his appraisal of UPCO's accomplishments, Dr. Saguiguit stated:

"To my mind there are three major accomplishments of the program. First is the general area of staff development. When the UPCO program was started we had a skeleton staff in almost all of the departments, but as the program developed through the past nine years you will be surprised that each department can now boast of competencies that were not even dreamed of before.

"The second area of accomplishment, I think, is the area of programs, especially at the graduate level. Earlier, we concentrated more on the undergraduate level, but the UPCO program picked up in a very logical manner the rational programming of graduate

studies on campus. We decided from the beginning to develop six areas of operation and we have developed each area very comprehensively to the extent that no other institution now in Southeast Asia, or in the tropics in general, could provide these programs except Los Baños which was developed as a result of the UPCO program.

"The third area of major accomplishment is in facilities and resources in support of the programs. As the program developed, all of the departments developed their own physical facilities as dictated by their needs for supporting better programs of graduate studies and research and in support of the enthusiasm of their young staff members."

#### EVALUATION BY THE DIRECTOR OF GRADUATE STUDIES

In an interview on April 2, 1972, Dr. F. A. Bernardo,<sup>1</sup> Director of Graduate Studies, summarized his appraisal of the accomplishments of the UPCO program:

"The major benefit of this relationship with Cornell is that we were able to develop a very strong graduate program here at Los Baños which would not have been possible within this period without the assistance of Cornell. We could have developed a strong graduate program over many years, but we could not have speeded it up, we could not have accelerated it, without the assistance we have had from Cornell University. So, I think that is the major accomplishment of the UP-Cornell Graduate Education Program.

"Of course, there are several other things which are actually components of graduate education, such as staff development, the rapid buildup of the library, the textbook publishing program, and the setting up of the scientific store.

"I think the idea of graduate students going to Cornell to take up courses and coming back to do their thesis research here is an excellent idea.... It is a worthwhile investment because the work of the students is more relevant and the graduate student actually gains time in the sense that he already has the nucleus of a research program right after completion of the Ph.D.

"The College of Agriculture has really gone to the mainstream of national efforts in agricultural development. Our tie-up with the National Food and Agriculture Council is a strong one; in fact, this coordinating body has looked upon the College and its staff for its leadership in developing programs and in implementing field programs throughout the country. The Cornell staff has helped in many ways—the very great involvement of Dr. Darrah, Dr. Feuer, and Dr. Levine are cases in point. Even outside of our role in the National Food and Agriculture Council, we have really taken the initiative, with the help of Cornell, in making our work more relevant on a nationwide scale. The work on water management has brought the re-

<sup>1</sup>Dr. Bernardo was appointed Dean of the U.P. College of Agriculture in July, 1973.

sources and expertise of the UPCA, with the help of Cornell professors, to faraway places, places where our staff probably would not have started working without the assistance we have had."

### *Benefits to Cornell*

#### STRENGTHENED INTERNATIONAL AGRICULTURAL DIMENSION

The initiation of the UP-Cornell Graduate Education Program coincided with the establishment of the fourth dimension—International Agricultural Development—in the functions of the College of Agriculture at Cornell. It was logical, therefore, that one of the objectives of the UPCO program would be to strengthen the international agricultural activities at Cornell University. This was accomplished, and UPCO became an integral part of the University's research, teaching, and extension programs. There are probably greater competencies and capabilities on Philippine agricultural education and research in Cornell today than exists anywhere in the world outside of the Philippines.

Thirty-two visiting professors represented Cornell at Los Baños in their respective subject matter areas for periods of one year or longer under the UPCO program. An additional 26 served as short-term visiting professors and consultants for periods of six months or less. (See Appendix F for lists of participants.) Out of this total group of participants, six were recruited from institutions other than Cornell, with three of them having previous service at Cornell. Counting those who served on the earlier Cornell-Los Baños program, about one-fifth of the faculty of Agriculture and Life Sciences have participated in the two programs since 1952.

#### IMPROVED INSTRUCTION

Faculty members who lived and worked in the Philippines came home with a much broader point of view and a deeper appreciation and understanding of the problems faced by the world's peoples. These experiences have greatly influenced their teaching, research, and extension activities after they returned to Cornell. Without exception, they are better informed, more competent scientists and teachers by virtue of their participation in the UPCO program. Students in their classes at Cornell also gain much from the international application of the world-wide perspectives injected into the many courses being taught by "Los Baños alumni."

#### GRADUATE STUDENTS PREPARED FOR INTERNATIONAL CAREERS

An important feature of the UPCO program was the training of Cornell graduate students for careers in international agriculture. This is an area that was largely neglected by most American uni-

versities in 1962 when the program was planned. Twenty-three Cornell graduate students (with one exception, all Ph.D. candidates) participated in the program at Los Baños. They served as instructors, teaching both undergraduate and graduate courses, and conducted their thesis research projects, often in consultation with Filipino staff and graduate students. They helped to expedite the work of visiting professors and played significant roles as teachers of research attitudes, techniques, and scholarly pursuits appropriate to a high-quality College of Agriculture.

It is significant that at the time this review is written almost two-thirds (fourteen) of the Cornell graduate student participants occupy important international positions with foundations, international research and training centers, and universities (see Appendix G). It is interesting that most of these individuals have been credited with two years of experience by their employers and thus have started at higher salaries than most young Ph.D's without this overseas experience. Thus, the UPCO program has provided a good source of well-trained scientists and teachers for leadership in the field of international agriculture.

#### VISITING PROFESSORS AND GRADUATE STUDENTS ADDED TO CORNELL'S COMPETENCE

Participating Filipino faculty and graduate assistants who came to Cornell made major contributions to Cornell's competence in international agriculture and to mutual understanding between nations. Four members of the UPCA faculty each served for one year as a visiting professor at Cornell. They taught classes, participated in seminars and other graduate education activities contributing to the international aspects of their subject matter discipline. Twenty-two young UPCA staff members went to Cornell as candidates for advanced degrees, mostly at the Ph.D. level, and served as teaching and research assistants. The model established whereby most of the Ph.D. candidates returned to Los Baños for their thesis research has been expanded to other programs at Cornell and approximately 50 graduate students now go abroad each year for their dissertation research.

#### DEAN PALM'S EVALUATION

Commenting on benefits to the New York State College of Agriculture and Life Sciences at Cornell, Charles E. Palm, Dean of the College during the life of the UP-Cornell Graduate Education Program, said:

"Our faculty received a tremendous stimulus from living and working with their associates at Los Baños, and they were more valuable to Cornell when they returned. After the Philippine experience, we

have a great sense of pride in wanting to do something to help solve the problems of people. We have a different concept of responsibility to the society of nations than we had before. It did something good and lasting for us and we appreciated the opportunity.

“The College of Agriculture at the University of the Philippines and the New York State College of Agriculture and Life Sciences at Cornell University pioneered together in several areas, including the training of young men and women, by utilizing the resources of both universities in a close partnership. This may be one of the lasting contributions that is already taken for granted as the appropriate way to conduct graduate study in international areas. Not only were Filipino graduate students at Cornell able to return to their own country to do their thesis research on problems similar to those they would face later on, but our own graduate students at Cornell had similar opportunities.

“In both cases, students’ research study in the Philippines benefited not only the people there but also the students. More of our own young people are seeking this type of training and they anticipate international careers in agriculture that will remain productive well into the twenty-first century.

“The many faculty members in our college who participated in this program are a great strength for us and for our students. The exchange of ideas has brought about better understanding of world problems and broadened our horizons. We have learned much through cooperative effort among scholars in different disciplines at Los Baños, from the Filipino students who came to study with us, and from the farmers, agricultural businessmen, and government leaders in the Philippines.

“Being a participant in this great educational adventure has been one of the highlights in the history of the College of Agriculture and Life Sciences at Cornell. It was a vital experience in international education and the benefits for both partners will last for many years to come. We at Cornell are grateful to the Ford Foundation and to all those who made possible the nine years of pleasant, constructive relationships under the UP-Cornell Graduate Education Program.”

## Chapter XI

### Some Problem Areas

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## CHAPTER XI

### Some Problem Areas

Throughout this review, emphasis has been given to the progress made since 1952 in the development of the UPCA to its present place of importance as an educational and research institution. Like most educational institutions, however, the College faces continuing major problems as it deals with its mission of service to the Philippines and as a regional graduate education center. These problems are not unique to Los Baños; most universities throughout the world have similar problems in varying degrees. In recent years rising discontent and activism among students and faculty, financial stresses of rising costs, low faculty morale, retention of key faculty, role of the faculty and students in decision-making, and many other problems have challenged university leaders in almost every country, including the Philippines.

Based on self-studies by the faculty, the judgment of the UPCA administration, and that of the visiting Cornell professors, the major problems facing the UPCA at the termination of the UPCO program are largely in these areas:

- (1) Retention of the productive members of the faculty;
- (2) Adequate financial support for the functions of the College;
- (3) Support for maintenance of physical facilities and equipment;
- (4) Continuing need for strengthening the basic sciences;
- (5) Efficiency of business management operations; and
- (6) Communications between students, faculty, administration and the public.

These problem areas are not new; most of them have grown up with the institution and are of long standing. To solve them gradually over a period of years requires the best efforts of everyone—the leadership and administration at the university, college, and department levels, and the full cooperation and participation of the faculty as well as understanding and support from leaders in national agricultural organizations.

### *Retention of the Productive Members of the Faculty*

The most important single ingredient in the College's ability to meet its responsibilities in the future is a high-quality, productive faculty. Much of the progress made in staff development over the past 20 years can be lost very quickly if the "brain drain" that has occurred during the past two years (1971-1973) is not reversed or slowed down. Too many of the most able and experienced members of the faculty have been attracted to positions with international organizations, universities, and governments in other countries, and with government organizations and private industries in the Philippines.

In a majority of cases the depth of well-trained personnel in the various disciplines is not sufficient to allow for the loss of these teachers and scientists without serious detriment to the College in its instruction and research programs and in training of future leaders. While from some standpoints it is a credit to the growth and maturity of the UPCA for it to be recognized as a source of supply of highly qualified scientists, it is like "killing the goose that laid the golden egg" when its best scientists and teachers are lured away to "greener pastures."

As long as staff members in the College take positions with other Philippine agricultural agencies, they are not lost to Philippine agricultural development. But those who go to other countries for an extended period on much larger salaries are not likely to return to the Philippines. A fairly large number have emigrated to the United States.

The significant question is "Why are so many of the staff leaving the UPCA for positions elsewhere?" The major reason probably is low morale among the faculty due to a number of factors, the principal one being low faculty salaries. Even though salary scales have gone up about 50 per cent since 1963, the actual purchasing power has declined due to inflation and the devaluation of the peso. Further, the increases have been largely "across the board," rather than based on merit and performance of the faculty member. Salary scales are not competitive with other agencies in the Philippines outside of the College or outside of the country.

The slow rate of promotion in rank is a second factor that contributes to low faculty morale. Only a small proportion of the active teaching and research faculty members have been promoted to the associate and full professor grades. Another common complaint that one hears is that returning Ph.D.'s are placed back on salary items with only one or two increments as a reward for their professional improvement. Some who had not taken advanced training were in higher salaried positions than the returnees.

In a discussion on the problem of the "brain drain" with one of the leading UPCA staff in 1972, he said:

“The leaders in government and the University of the Philippines must be made to realize and recognize the value of competencies in the personnel of the education and research institutions in the Philippines and the necessity for salary levels that are competitive and will enable the UPCA to keep its most capable and productive scientists and teachers on its faculty. It will be catastrophic if the competencies that have been developed in the faculty of the U.P. College of Agriculture are allowed to be dissipated.”

When he served as consultant on the research and graduate education program in 1966, Dr. W. K. Kennedy, now Dean of the College of Agriculture and Life Sciences at Cornell, made this observation that is still very timely:

“The President and Board of Regents of the University, government officials, and agricultural leaders must constantly be informed of the keen competition for outstanding faculty members and the need for rewarding good performance with adequate salary and support. They must be shown that the problems of employment and retention of a strong faculty are considerably different from the employment of staff in other government agencies.”

It would appear the most important steps that would help to retain the most capable members of the faculty at Los Baños are: (1) the establishment of a realistic salary scale that is competitive, and (2) policies that would give high priority to promotions in salary and rank that are based on competence, performance, and experience in teaching and research.

The recruitment, development, and retention of a strong faculty is absolutely essential for any college which aspires to greatness. It is the faculty which attracts and trains the students and the most important product of any university is its undergraduate and graduate students.

### *Adequate Financial Support for Functions of the College*

Next to retention of a high-quality staff, adequate operational support for the teaching, research, and extension functions of the faculty is the major problem area facing the UPCA.

A very large proportion (80–85 per cent) of the annual recurring peso budget is allocated to salaries with relatively small amounts available for “bread and butter” funds for teaching and research supplies, travel, maintenance and repairs of equipment, and other operational costs. The real need is for an increased core budget for support of the basic functions of the faculty that can be allocated on a regular basis to departments in accordance with their program needs.

Some relief has been obtained through increased support from grants for specific research projects from the NSDB and the NRC. These grants provide badly needed funds for specific projects for some

members of the faculty but it must be recognized they are relatively temporary and do not replace the need for an increased core budget.

### *Support for Maintenance of Physical Facilities and Equipment*

Maintenance of a large physical plant is difficult under most circumstances and is much more acute in a tropical environment such as that at Los Baños than in a temperate climate. With the large number of attractive new buildings now on campus one of the critical needs is for adequate funds for their maintenance and repairs. Over the past two decades emphasis has been given to the need in the UPCA budget for adequate funds for maintenance, so it is especially critical now with greatly expanded facilities. One of the new buildings alone, Biological Sciences, has more laboratory space than was available in all buildings combined before the initiation of the campus development program.

Studies in the United States have shown that the annual cost for salaries, maintenance and supplies to utilize a scientific building is about one-third of the original cost of the building. Although costs in the Philippines will no doubt be lower, this emphasizes why a very strenuous effort needs to be made to increase greatly the budget allocations for building maintenance and operation. This must be done if the modern physical facilities are to be used effectively and if proper return on the investment is to be realized.

Throughout the UPCA program, funds have been provided in the Ford Foundation grants for research equipment and supplies. Under the terms of the last two-year grant (1970-1972), the allocation from the grant had to be matched by the University with pesos on a 1:2 basis. Earlier, there had been some indication of reductions in allocations of funds for equipment in the U.P. budget, possibly because grant funds were available for these purposes. The budgetary provision for equipment during the past 10 years from Ford grants is one which the UPCA will sorely miss.

It is difficult to measure the value of equipment acquired during the 10 years in relation to graduate education and research at Los Baños. Faculty committees on acquisition of equipment studied and screened the priority lists from the departments each year before submitting final lists to be requisitioned on grant funds administered at Cornell.

Maintenance of specialized, expensive research equipment is especially difficult in the humid tropics. This is one of the major reasons why air-conditioned laboratories are needed to make them more functional and productive.

The U.P. allocation for equipment and supplies has never been sufficient, and spiraling costs of supplies and materials have offset modest gains that have been made. It was most unfortunate that funds

were not available for more adequate, new and modern equipment for the new Physical Sciences building. In most areas, the equipment available simply is not adequate in quantity or quality for modern teaching of the basic science subjects.

There is much that could be done toward improved maintenance and repairs of equipment, with no additional funds, simply by greater attention and sensitivity on the part of the individual staff member. One observes many pieces of laboratory equipment that are not operating because of the need for relatively simple repair parts.

### *Strengthening the Basic Sciences*

Even though much progress has been made in staff development during the past 10 years, there is still much to be done in further strengthening the basic sciences of Chemistry, Physics, and Mathematics to desirable levels of quality and depth of staff necessary for the instructional needs of the University at Los Baños. High-quality instruction in these subjects is essential for all students, especially those in the biological and agricultural sciences.

Several well-trained staff in the basic sciences have returned from advanced degree programs abroad, but others have left the College leaving serious deficiencies in several of the disciplines in Chemistry, especially organic and biochemistry, and in Physics and Mathematics. Larger numbers of staff of high quality are needed in almost all of the basic sciences if graduate studies at Los Baños are to grow and flourish in addition to sound undergraduate studies.

With the establishment of a new College of Science and Humanities in the UPLB in 1973, it is hoped necessary steps will be taken by the administration to strengthen these areas that are so basic to a modern agricultural university.

### *Efficiency of Business Management Procedures*

"The universal complaint of Philippine professors and research workers and of many administrators on the Los Baños campus was the slowness and complicated nature of existing business procedures and the requirements of the Diliman headquarters in dealing with matters in the Los Baños complex."

Unfortunately, these words seemed just as true in 1971-1972 at the termination of the UPCO program as they did five years earlier when they appeared in the Insee, Dalisay, and Efferson report on their review of the UPCO program.<sup>1</sup> Similar comments have been made many times earlier in the terminal reports of visiting professors.

<sup>1</sup>Review of the UPCA-Cornell Program in Graduate Education and Research at Los Baños, May, 1967, by Insee Chandrastitya, Amando Dalisay, and J. Norman Efferson. Mimeographed Report to the President, University of the Philippines.

Various studies and reviews of business management procedures at Los Baños and at Diliman have been made. Many recommendations have been made that would eliminate inefficiencies and shorten the time for approval and payment of vouchers and delivery of goods and services.

The Director of Business and Administrative Affairs in recent years has taken steps to improve efficiency by implementation of several innovations in some areas. Some of these are: (1) decentralization of accounting functions; (2) computerization of payrolls and bills; (3) establishment of revolving fund budgets for student residence halls and staff houses; and (4) studies on performance budgeting. Problems of concern to the faculty still persist, however, and there is need for additional steps to speed up procedures by reducing unnecessary paper work.

A certain amount of control is necessary in a government agency to protect the scientist who is interested in obtaining the necessary funds, supplies and equipment for his research, teaching and/or extension activities. But delays of six to twelve months, and even longer, may be enough to discourage a young, energetic Ph.D. from going any further in his research program.

The function of a business office is to handle the fiscal and management affairs of the University and to help the teaching and research staff and the administration to be more productive in carrying out their many functions. The job of the business office is to expedite the financial and business procedures necessary for efficient and successful operations.

There were those at Los Baños in 1972 who felt that greater autonomy of the Los Baños units would provide, among many other things, opportunities for streamlining many of the fiscal and business procedures. It is essential that the chief administrative officer (Chancellor) be empowered to assume direct authority for the efficient operations and coordinated development of the Los Baños units of the University.

### *Communications between Administration, Faculty, Students and the Public*

Almost all institutions of higher education experience problems in communications between the administration, faculty, and student body and the general public, and the University of the Philippines is no exception.

Some of the communication problems at Los Baños were elucidated in 1971 by the UPCA Task Force in its report, "Directions, Designs for Decisions in the Seventies."

"The need to restructure the administrative organization of the College is primarily motivated by the prevalent observation of the

staff that the current set-up does not facilitate immediate decision on matters that require prompt action. Also, lack of faculty involvement in policy-making has been decried such that many are heard to comment, 'They decide that upstairs'.

"What seems to be called for are: a. Establishment of mechanisms for greater faculty involvement; b. Immediate decision on matters needing prompt action; c. Clear delineation of functions and responsibilities of administrators."

The Task Force made many recommendations that it felt would improve communications and provide for more effective operation of the University. Among them were the following:

1. Create faculty advisory committees to represent the interests of the faculty in policy and procedural matters, along with the development, coordination, and evaluation of activities in the several programs.

2. Abolish and reconstitute standing committees.

3. Create a faculty council.

4. Create the Dean's Council (to replace existing Director's Council) to discuss major policy questions and developments in the implementation of programs and projects.

5. Define purpose and composition of faculty meetings.

6. Define purpose and composition of Executive Committee meetings to facilitate two-way communication between the administration and the different departments dealing with matters of an administrative or organizational nature.

7. Institute an annual "State of the College" address whereby the Dean can recapitulate the developments of the past year and chart the direction of the coming year.

8. Institute conferences between College officials and the staff of departments.

9. Define functions of department chairmen, create departmental committees, and establish a staff incentive system.

10. Publish information manuals—staff and student directories, manual of policies and procedures.

11. Disseminate information at all levels.

12. Establish an Office of Institutional Research and Development.

These recommendations by the College's Task Force, as a result of their analysis, indicated a feeling that the administration was not sensitive to the needs of the faculty. This lack of communication between administration and the faculty was a major factor contributing to low faculty morale. This point of view was often expressed to the writer in 1972 in his discussions with department chairmen and faculty. Typical comments were these:

"The faculty needs to feel that the administration has their interests at heart."

"The faculty should be involved more and they should be given greater opportunity to participate in the decision-making process."

### *Good Public Relations Essential for Financial Support*

Another area in communications of great importance to the UPCA is the effect that good public relations programs can have to continued financial support. Additional financial support for the University must come from the government. The government is people speaking through their elected representatives. People in the Philippines will support and expand their support only if the University is doing its job well and if the people are fully informed. Good public relations is doing a good job and then letting the world know about it. To accomplish this, the story must be told over and over again, using all known media in every possible way.

The UPCA has done a good job, especially during the past ten years, in its teaching, its research, and in its programs in extension education, and through the efforts of the Department of Agricultural Communications in getting research results into the hands of the people. But the information services and public relations function of the UPCA need to be intensified and expanded if all segments of the general public are to appreciate the role of the College and give it their support in the future.



## Chapter XII

# Appraisal of UPCO Program and the UPCA

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## CHAPTER XII

# Appraisal of UPCO Program and the UPCA

Time will tell better than words whether the accomplishments of the UPCO Program will be lasting in their effects on the quality of trained manpower for leadership in the agricultural sciences and on agricultural development in the Philippines. There is no control against which to make a direct comparison, and in the final analysis the future performance of the Filipinos will determine the permanent progress achieved. When one views the College, its faculty, programs and campus in 1972 as compared with 1952, however, there is little doubt but that the cooperative projects have indeed played significant roles in developing education and research capabilities at Los Baños that are second to none in the less-developed countries of the world.

Some reviews and appraisals of the UPCO Program and the UPCA have been made by outside groups and are summarized briefly here, along with a review of the factors, both favorable and unfavorable, that affected the operation of the joint program for the improvement of education and research at the U.P. College of Agriculture.

### *Ford Foundation Team Makes Review<sup>1</sup>*

The Ford Foundation invited a team of three consultants in 1967 to review the UPCO program, evaluate the progress from 1962 to date, and to make recommendations as to desirable changes, if any, in the program. After a careful review, this team of consultants observed in their report:

“In the slightly more than four years since the UPCO program was started in September, 1963, major progress has been made toward achieving the objectives outlined in the initial planning. Some of the more important accomplishments include:

1. Increases in salaries.
2. Larger numbers of young staff members taking advantage of opportunities for advanced training.
3. Expansion of graduate studies in most departments.

<sup>1</sup>Review of the UPCA Cornell Program in Graduate Education and Research at Los Baños, May, 1967, by Insee Chandrastitya, Amando Dalisay, and J. Norman Efferson<sup>1</sup>. Mimeographed Report to the President, University of the Philippines.

4. Appointment of a Director of Extension Education and of extension subject-matter specialists.
5. Allocation of some operating funds to departments.
6. Maintenance of revolving funds in some departments.
7. Establishment of the Department of Agricultural Information and Communications.
8. Strengthening of agricultural statistics and the formation of a Department of Applied Mathematics.
9. Evaluation of departmental programs and analysis of teaching, research, and extension programs by the staff of each department.
10. The beginning of a campus development program, including the construction of faculty houses and apartments, new public utilities and roads, and some major buildings either under construction or planned for the near future."

In regard to the graduate student component, the review team stated further:

"The initial results indicate that the objectives were well-founded and can be achieved. To complete the overall objectives, however, it appears that at least four to five four-year cycles are desirable to produce in depth the trained personnel needed to make Los Baños contribute its maximum to the Philippines and to Southeast Asia and have sufficient trained and experienced manpower in agricultural research and development to continue to grow after the Ford Foundation support and Cornell assistance are withdrawn. This means that a total of from 15 to 20 years will be required to obtain maximum results from the investment."

Some of the more important items suggested by the review team for consideration and study as possible approaches to improving the UPKO program and the U.P. College of Agriculture were: (1) maintain quality staff; (2) establish a Director of Graduate Studies; (3) develop a program for a gradual phasing-out of non-Philippine funds; (4) expand information and public relations services; (5) intensify the strengthening of undergraduate program; (6) simplify and make more flexible existing business procedures; (7) decentralize decision-making; (8) strengthen department heads; lengthen their tenure; (9) strengthen the structure and functions of each department; (10) provide additional travel funds for faculty and students; (11) get more involved in actual extension work; (12) continue to improve library facilities; (13) establish an efficient scientific supply store; (14) provide housing for undergraduate and graduate students; (15) develop a planned maintenance program; (16) secure fund support for the UPCA development program; and (17) develop the place of SEAMES in the long time graduate program.

Many of these recommendations were accomplished (see Chapters IX and X); others remain as problems to be solved, if solvable, by the

faculty and administration of the University at Los Baños (see Chapter XI).

*Case-Bunnell Study of External Assistance  
to the University of the Philippines<sup>2</sup>*

In their analysis of the nature, effects, accomplishments, and shortcomings of external assistance to the University of the Philippines up to early 1969, Harry L. Case and Robert A. Bunnell make frequent references to the Cornell-Los Baños programs. Some of their comments and appraisal of the role of visiting professors are of interest here.

"A realistic appraisal of the functions of the visiting professor should recognize the fact that he is usually not there exclusively for the benefit of the host institution. He has his own research and other professional interests in mind too. Where the visiting professor is on the faculty of a contracting American institution, the contract is normally seen by all parties as having a triple purpose: (1) technical assistance to the receiving institution; (2) upbuilding of the faculty of the U.S. contracting institution in the area of Asian, tropical or other studies; and (3) professional opportunities for the individual visiting professor, particularly research opportunities. Since the cost of fielding a visiting professor for a year is a very large item—sometimes the principal item—in an assistance program, this consideration can loom large in any attempt to arrive at the true amount which should be theoretically charged against the receiving agency in a strict accounting of assistance. As far as we know, no one has attempted to do this.

"A major advantage of the policy of institutional contracts which has been rather extensively used by the aid-giving agencies at the University is that it ordinarily makes possible the recruitment of faculty personally known to those responsible for the project at the back-stopping institution. Failures in technical assistance are much more likely to come from personal unsuitability, which may be a family as well as an individual affair, than from technical incompetence, and personal suitability is very difficult to check definitively in the ordinary recruitment process. A much more reliable judgment is possible in the selection of overseas personnel from among one's colleagues, where personal strengths and weaknesses are likely to be known. Another advantage of the contractual method is in continuity of program, an important consideration in view of the virtual impossibility of getting visiting professors assigned for periods of more than two years.

"These points are well illustrated in the case of the Cornell University contracts at the College of Agriculture, which have run, with a

<sup>2</sup>The University of the Philippines: External Assistance and Development. Harry L. Case and Robert A. Bunnell, published by International Studies in Education, Michigan State University, East Lansing, Michigan. 1970.

brief hiatus, for more than fifteen years now. This long-term relationship has permitted a wide spectrum of the resources of the Cornell College of Agriculture to be available to Los Baños, and genuine inter-institutional cooperation has developed. In fact the program has long been known as the Cornell-Los Baños Program. The danger exists, of course, that the U.S. contracting institution may develop a vested interest in the continuation of the technical assistance program, which could conflict with the necessary objective in technical assistance of working one's self out of a job. Nevertheless, up to the present the error has more generally been on the other side, in the form of an underestimation on the part of the financing agencies of the time required to do an effective job of institution-building. Dean Myer's estimate in 1952 that the Cornell-Los Baños Program should be a fifteen to twenty-year program is turning out to be nearer the mark than the short-term estimates of the financing agencies.

"The tougher questions arise in the careful planning and review of the evolution of technical assistance, from the earliest stages, when the visiting professors are virtually tutors of a young and inexperienced faculty, which was the general situation at the University in the period immediately after the war, to the later stages, when the faculty has reached a point of maturity where it wants primarily consultation with experienced colleagues from the outside. In this situation initiatives are expected to come from the University faculty and the visiting professors may be used more as sounding boards on which to test out ideas. At this stage the institutional relationship may well have outlived its usefulness. The ideal toward which university aid might well aspire would involve a careful thinking out at the start, with appropriate modifications with experience, of an evolutionary plan leading from the stage of tutelage to the stage of consultation."

Some of these points discussed by Case and Bunnell were taken into consideration several years earlier when the UPCO program was formulated. For example, it was recognized in some disciplines that a stage of maturity and depth of staff competence already had been reached in the UPCA where the need for external assistance was greatly reduced. This was one of the reasons for using short-term visiting professors and consultants.

The close relationship between Cornell University and the University of the Philippines has been clearly one of a partnership between peers, a sister university relationship, one in which initiative and decision-making were shared in the establishment of goals, formulation of operational procedures, program activities, and in the measurement of results.

### *Self-analysis by UPCA Faculty: Viability Study*

All departments of the UPCA made reviews in 1965 of their teaching, research, and extension activities, and administrative policies

and practices, and laid out priorities of efforts. Relatively little emphasis was given to specific planning for long-term financing and organizational viability. In 1969 an Ad Hoc Self-Study Committee for the Los Baños Units was appointed by Vice-President Umali. Its report was divided into four parts: (1) problems and recommendations of the Los Baños units; (2) proposed reorganization of UP Los Baños; (3) proposed codal provisions to effect greater autonomy for UP Los Baños; and (4) proposed organization of the Office of Student Affairs. This committee was part of the total University effort and followed an announcement by President Salvador P. Lopez that "measures will be taken toward administrative reorganization and reform in the University." The faculty at Los Baños recognizes that:

"there is indeed a need to re-examine our organization, methods, and procedures in order to strengthen the University and to achieve a more efficient and action-oriented operation that is geared to our goals of development, creativity, and academic excellence."

#### TASK FORCE ESTABLISHED

Later, the departments made comprehensive self-analyses and developed detailed plans for the future. Dean F. T. Orillo created a five-man Task Force to plan the UPCA Development Program for the Seventies, which became known as the viability study, through his memorandum of August 31, 1970:

MEMORANDUM NO. 112

Series of 1970

TO: Dr. Marcos R. Vega  
 Dr. Higinio A. Ables  
 Dr. Santiago N. Tilo  
 Dr. Jose Eusebio  
 Mr. Geronimo Collado

(Through their respective Department Chairmen)

SUBJECT: Second Five-Year Development Program for the UPCA

With Dr. M. R. Vega as chairman, please constitute yourselves into a Task Force to evolve the second five-year development program of the U.P. College of Agriculture. In accomplishing this task, please be reminded that each department at UPCA has already submitted to the Dean's Office its departmental self-study and proposed five-year development program or at least some proposals for inclusion in the College-wide development program. Copies of these are available in my office for you to review.

Attached herewith to serve as a guideline for you is a copy of the Statement of Philosophy, Objectives, and Goals of UPCA as conceived before by Vice-President D. L. Umali and some of his colleagues.

I am hereby delegating to you a blanket authority to visit each department and review with department chairmen and staff their proposals, and to commission the services of any resource person in the College. In addition, Dr. Augusto Tenmatay of U.P. Diliman, Drs. Robert Clodius and Jacob Stampen of the University of Wisconsin and Drs. David Szanton and Gerald Korzan and Mr. John Polsrock of Ford Foundation, Manila, indicated their willingness to serve as part of the Task Force. You may therefore make use of their expertise as you deem necessary.

You may also engage the services of Dr. F. A. Bernardo most specially on UPLB-wide problems.

To provide an opportunity for me to be kept posted on your progress and also give me a chance to decide any policy questions that might arise, and set the direction that we should take, we shall meet every Friday evening at 7:30 p.m. in my office.

I am counting on your wholehearted cooperation and dedicated service for the best interest of the U.P. College of Agriculture in the 1970's.

s/F. T. Orillo  
Dean

cc: Dr. Robert Clodius, Dr. Augusto Tenmatay, Dr. Clark Bloom, Dr. Jacob Stampen, Dr. David Szanton, Dr. Gerald Korzan, Mr. John Polsrock, Dr. F. A. Bernardo.

The following memorandum prepared earlier for former Dean Umali by members of the faculty provided some guidelines for the Task Force as they assumed their duties:

MEMORANDUM FOR: Dean D. L. Umali October 17, 1969  
SUBJECT: Some Topics for the Statement on Philosophy, Objectives and Goals of UPCA to be Delivered to the *Second Five-Year Development Program Committee*

1. Modern society will always demand a continuing reorientation of the UPCA programs, hence the UPCA should provide leadership in agricultural education, research and extension not only in the country but in the region as well.
2. The College has to create and initiate innovations.
3. Provide the most favorable environment for scholarship.
4. Provide an organization that is not only action-oriented but also responsive to development goals.
5. Relate activities to expanding and pressing needs of the country and the dynamics of life.
6. Advocate progressive nationalism and encourage international understanding.
7. Orient programs toward national development.
8. Maximize resources for priority programs.

9. Boldness and realism in programs.
10. Be a model of the past and an agent of change.
11. Interdisciplinary approach and concentration in general and specialized priority programs.
12. Emphasize applied research without neglecting basic research.
13. Encourage participation of College constituents.
14. Create an atmosphere of awareness and involvement.
15. Create a program for generating funds.

#### OBJECTIVES OF THE TASK FORCE

To set the direction of its planning task, the Task Force and the Dean agreed on the following enabling objectives:

1. Design mission statements for the UPCA.
2. Evaluate present instruction, research and public service programs, including an examination of human, fiscal and physical resources and policies.
3. Formulate programs in the light of the designed statement of purpose:
  - a) Instruction program (graduate and undergraduate).
  - b) Research program.
  - c) Public service program.
  - d) Program to promote fiscal viability.
  - e) Program to promote organizational viability.

In addition to its own staff in Manila, the Ford Foundation provided the services of Dr. Robert L. Clodius and Dr. Jacob Stampen of the University of Wisconsin to serve as resource persons for the Task Force in their deliberations and studies that continued for about seven months. In their analysis and report this Task Force gave emphasis to programs and specific targets so that the physical and human resources which the College has amassed would be more efficiently and effectively put to use.

The need for faculty involvement was recognized, since more than anyone else the faculty has a greater role, eventual responsibility, and stake in bringing about needed academic reforms. Further, the report addressed itself to the outside world where financial and other support has and will have to come from in the future. As well-defined programs and projects are developed, the College would then be in a better position to command external support.

In addition to its recommendations for improving instruction, research, extension education, and closer working relations between research and extension (as summarized briefly in Chapters X and XI), the Task Force recommended restructuring of the College administrative organization, establishment of a staff incentive system, establishment of an Office of Institutional Research and Development, and a

large number of programs for greater viability and autonomy in the future.

This self-analysis under the leadership of the faculty committee, with the full cooperation and active participation of the department chairmen and their staffs, was in itself a measure of the maturity of the faculty in 1970-1971. Only a few years earlier "ivory tower" attitudes had prevailed when there were few, if any, faculty committees and faculty meetings, and no directors of instruction, research, and extension education, Director's Council, or Executive Committee. There was not the freedom for criticisms directed at centralization of decision-making, the organization and administrative structure, lack of systematic planning, and lack of communications between administration, faculty, and students. These criticisms by the Task Force are all timely but the fact that they were made by members of the faculty is an indication of progress made in institutional development.

As stated by the Task Force the programs recommended

"reflect a shift in emphasis from institution building to efficient and effective utilization of existing resources in solving the nation's agricultural problems. More than before, the College must emphasize program focus in its development."

#### STATEMENT OF PURPOSE OF THE UPCA

The statement of purpose of the College serves as a built-in system for self-evaluation, a blueprint for development, and a point of departure for subsequent reorientation.

##### *Instruction*

The U.P. College of Agriculture will continue to:

1. Provide an opportunity in the Philippines for undergraduate and graduate study in the several disciplines of agriculture and related sciences.
2. Maintain the highest level of quality in its instruction program.
3. Make itself the center for graduate studies in agriculture and related sciences in the Philippines.
4. Provide national leadership in agricultural education.

The U.P. College of Agriculture aims to:

5. Relate its instruction program to the manpower needs of the Philippines and Southeast Asia.

##### *Research*

The U.P. College of Agriculture will continue:

1. To respond to the agricultural needs and problems of the Philippines and Southeast Asia.
2. To be the premier research arm of the government in the agricultural sciences by relating research to immediate and long-term problems.

3. To be unique in that it relates its research capabilities to the graduate education program.

The U.P. College of Agriculture aims to:

4. Encourage research that appeals to the scientific and academic interests of the staff.

#### *Extension Education*

1. Teach by appropriate means and disseminate to the public information on the problems and solutions of Philippine agriculture and rural life.

The U.P. College of Agriculture aims to:

2. Provide national leadership in extension education.
3. Identify problems and relationships in the agricultural sector that can be incorporated in the instruction and research programs.

"These statements should enable the UPCA to orchestrate its constituent sectors toward unified, coherent and systematic operations."

#### IMPLEMENTATION OF TASK FORCE RECOMMENDATIONS

Many laudable recommendations are contained in the report of the Ford Foundation-supported Task Force regarding programs and activities for viability of Los Baños in the next decade. Many of them are consonant with recommendations of visiting professors under the UPCO program, and they deal with most of the problem areas described in Chapter XI. There certainly is agreement with the need for greater involvement of the faculty in the decision-making processes, improvement of communications between administration, faculty, and students, delegation of more responsibilities to department chairmen, and improved strategies and planning for fund-raising if fiscal viability is to be attained. The recommendations of the Task Force need to be reviewed carefully by the faculty and steps taken by the administration to implement those of highest priority.

In the judgment of the writer, not enough consideration has been given to the unrealistic and impractical tenure of the Dean, the Department Chairmen, and the Directors. Yearly appointments of Department Chairmen and Directors and the three-year tenure of the Dean and the choice of these key administrative officials by popular vote (procedures used in recent years) are a step backward in efficient, effective administration and management. Under the system that prevailed in 1971-1972, the head of a unit found it difficult to make satisfactory plans and projections, and even if he were able to do so, it was difficult to make substantive accomplishments because his brief tenure did not give him the necessary time and continuity to understand fully his job and responsibilities.

### *Will SEARCA Fill the Vacuum?*

When SEARCA was established at Los Baños, the decision was made to fuse its academic programs with those of the UPCA. There was agreement that the administration of the new regional graduate center should be sufficiently within the existing leadership of the College of Agriculture to insure effective integration and maximum use of resources, but not so fully embedded as to preclude development of teaching and research programs that would be responsive to the needs and interests of non-Filipino students. Those of us at Cornell, and others, felt that with the right kind of organization and with capable leadership and financial support, SEARCA could play a significant role in the continuing development of the UPCA after the termination of the UPCO program.

As stated in the original SEARCA constitution adopted in 1969, the functions shall be as follows:

- a. Provide high-quality study programs leading to the Master's and Doctor's degrees.
- b. Provide graduate scholarships, fellowships, and/or assistantships for students from member countries.
- c. Promote, undertake, and coordinate research programs, as instituted and supported by SEARCA, with special emphasis on research related to the needs and pressing problems of agriculture in Southeast Asia.
- d. Provide direction and funds for research by graduate students, faculty members, and other cooperating research workers of member countries.
- e. Publish the findings of agricultural research done in the region, and other pertinent research done elsewhere.
- f. Hold regional seminars on selected agricultural problems and topics.
- g. Provide advisory and consultative services to member countries through staff visits and exchanges, seminars, and participation in national training and extension programs, and
- h. Stimulate and assist further development of agricultural institutions in Southeast Asia and enlist their efforts in a concerted attack on agricultural problems of the region.

As will be noted, the basic objectives of SEARCA follow very logically those established in 1962 for the UPCO program. If they are attained the international dimension of Los Baños will be greatly enhanced.

The first SEARCA scholars, a group of 13 from three countries, enrolled for graduate study at the UPCA during 1968-1969. This number increased up to 65 from five different countries in 1971-1972.

SEARCA has supported research and extension programs on press-

ing agricultural problems confronting Southeast Asian nations. In the Philippines, for example, it cooperatively has supported research on downy mildew in corn, assisted with the establishment of a gene bank for economic crops in Asia, supported research on high-protein crops, established a social laboratory in Pila, Laguna, and research on high-level manpower requirements for agriculture in Southeast Asia.

In other countries SEARCA has cooperated with the Rubber Institute in Malaysia, Research Institute of Estate Crops in Indonesia, and has worked on the development of a method of accreditation of academic degrees earned by students in different universities in the region.

Much of the financial support during the early years of SEARCA for personnel and capital construction has come from USAID and the Government of the Philippines. Also, USAID and Philippine Government funds have contributed to the operational costs, but after the fifth year (1974) of operation, the Government of the Philippines assumes responsibility for the recurring operational costs of SEARCA. Chief among construction projects is the new library for the University at Los Baños, faculty houses, student dormitories, and apartments for married students.

Special funds for support of scholarships, personnel exchanges, conferences, séminars and workshops have been contributed mostly by the United States and the Governments of the Netherlands and Canada.

By the spring of 1972, country participation in SEARCA had widened from its original membership of Indonesia, Malaysia, Philippines, Thailand, and South Vietnam with the entry of the Royal Kingdom of Laos and of Khmer Republic. Mr. J. D. Drilon was the new Director, and he was embarking upon an ambitious fund-raising campaign that would support visiting professors and research scientists in several areas of specialization, including: 1) water resource management; 2) development economics; 3) food technology; 4) agri-business; and 5) documentation and data bank.

If adequate support is provided by the member countries, and with continuing able leadership, there is hope that SEARCA and the UPCA in their close relationships will make significant contributions to the social and economic well-being of the peoples of Southeast Asia.

### *Factors That Favored Successful Operation of the UPCO Program*

The degree of success in any enterprise, especially one dealing with the development of human resources for leadership, is determined by many factors. Examine first some of the positive factors that favored successful operation of the UPCO program, then consider some of the factors that served as constraints on successful operation.

The key factor favoring successful operation was the interest and commitment of the administration and faculty of each of the Universities, and the staff of the Ford Foundation and other foundations, to strengthen further the U.P. College of Agriculture through the improvement of education and research. There was a dedication and mission orientation toward the goal of training people for leadership in the development of the agricultural potentials of the Philippines and other low-income countries.

A genuine desire on the part of the administration and faculty of the UPCA in 1962 for a sister-university relationship, with emphasis on graduate education, and the favorable response from Cornell, provided mutual interests, trust, respect, and cooperation that were essential to successful planning and operation of the program. More than a year went into detailed planning which involved large numbers of the faculty and administrative officials of Cornell and the University of the Philippines and staff of the foundations. The objectives and goals, strategies for their attainment, operational guidelines, staffing patterns, financial responsibilities, and other details were mutually agreed upon well in advance of the initiation of the program.

The spirit of cooperation among the Filipino staff and their interest and willingness, in most cases, to work cooperatively in teams with visiting professors and graduate assistants contributed favorably to the success of the project. Visiting staff members were active members of the UPCA staff working on an equal basis with their Filipino colleagues, rather than advisors. With few exceptions, the climate was excellent for effective working relationships between the visiting professors and the UPCA faculty. There was a progressive movement toward a supportive and less visible role in those disciplines where local leadership developed and gained competence to assume responsibility. In some disciplines, Cornell was able to provide a continuity of professors and graduate students, with return assignments of the professors, that were particularly effective in helping to develop competencies of the Filipino staff and strengths of disciplinary programs. Strong personal and professional relationships developed between American and Filipino scientists that should endure long after the UPCO program has terminated.

Publications of research results were issued jointly by visiting and Filipino staff members, thus giving full credit to the local staff. Teaching often was a joint venture with mutual learning opportunities.

Short-term visiting professors and consultants were effective in specific roles in helping to attain the goals. Many of them had lived and worked earlier at Los Baños and were able to "take off" into their work immediately upon arrival. Graduate assistants, both American and Filipino, were important factors through their teaching and research in the success of the UPCO program.

Relatively long-term and liberal funding by the Ford Foundation, and the flexibility provided, enabled both universities to plan and operate effectively. A positive factor also was the arrangement for all operational funds from the supporting grants to be administered by the U.P. College of Agriculture. This gave pride to the College and a feeling of maturity and responsibility in the disbursement of funds for projects throughout the faculty.

The administration at Cornell had a strong commitment to send competent, experienced members of its faculty on assignment to Los Baños, often at the sacrifice of on-going programs at home. A high percentage of the participants were from Cornell and had therefore a dedication, sense of loyalty, and a keen desire for success of the program. All nominations of visiting professors and graduate assistants were approved by the UPCA administration and the staff of departments in which the visitors were to be located.

Cornell visiting professors and graduate students and their families were given orientation sessions and reading materials on the Philippines as early as possible after their selection for the project. The first session sought to acquaint all participants with the objectives—why Cornell was in the program and what it hoped to accomplish—and to consider logistical and housekeeping details, such as travel, clothing, housing and living conditions. The second session concentrated on the Philippines, a bird's-eye view of the nation, its history, culture, customs, and people, and the background of the University of the Philippines and other institutions of the Los Baños complex. Another session, which involved visiting Filipino faculty or outside individuals who had lived and worked in less-developed countries, was devoted to consideration of the personal and personnel factors essential for success in overseas service. Also, all families received indoctrination by the Project Leader after arrival in the Philippines. This kind of orientation helped to provide an understanding of the program and to aid in the adjustment of families to the social structure, culture, and customs of the Filipino people.

It was reassuring to have President Romulo's comments on the Cornell staff in a letter he sent to Dean Charles E. Palm on December 18th, 1964:

"May I say that we have been fortunate in the choice of the men from Cornell that you sent to Los Baños. They have not only been competent in their respective lines but they had the right attitude towards their Filipino colleagues and they have been cooperative and at the same time they have been respectful of our traditions and our national institutions. This is important when dealing with Asians and your men came with such a sympathetic understanding of our customs and ideals which made their work much easier and the co-operation and good will of our faculty at their bidding."

A favorable environment for cooperative working relationships was provided by the UPCA administration. The project leaders and selected visiting professors had an opportunity to meet regularly with policy-making groups of the College, such as the Executive Committee and the Director's Council. This was especially true during the first five to six years of the cooperative program.

Project reviews made regularly by members of the administration at Cornell, and several visits of UPCA administrators to Cornell, contributed to mutual understanding and successful operation of the UPCA program.

Another favorable factor was that English is the language used in the educational systems of both countries. With English as the common denominator there were few problems in communication attributable to language.

Excellent living quarters provided for the UPCA by the Rockefeller and Ford Foundations for the use of visiting professors and graduate assistants and their families aided greatly in their adjustment to a different culture and environment. Comfortable housing and living conditions help to produce a good atmosphere for productive teaching and research.

New teaching and research facilities and greatly expanded high-quality faculty housing provided through the five-year development program helped to improve the morale of the UPCA faculty and students and contributed to the general atmosphere for congenial relationships.

### *Factors That Served as Constraints on Successful Operation*

Along with the positive factors that favored success of the UPCA program, there were the usual minor problems and frustrations that bothered Cornell visiting staff, as well as Filipinos, at Los Baños and visiting professors and graduate students from the UPCA at Cornell. And there were some constraints (fortunately only a few) that served as impediments to optimum success in the attainment of goals.

The most significant constraint to successful operation, based on the judgment of the project leaders and visiting professors, was the fact that not all members of the faculty of the UPCA, including some department chairmen, fully understood the purposes and operational factors of the program. This occurred even though many members of the UPCA faculty helped plan the program and its operational procedure. The objectives and plan of operation were discussed fully with the faculty in each of the departments at the beginning and again at intervals later. This lack of understanding may have been due, at least in part, to the turnover in staff and department chairmen

and to the fact that relatively large numbers of staff returned from overseas graduate study after the UPCO program was initiated. In some quarters the lack of understanding was interpreted as an indication that some members of the faculty, probably a small proportion, were not as interested in having outside assistance and cooperation as the administration. Among some staff there was a lack of appreciation that the UPCO program was different from the first Cornell-Los Baños program, without recognition that graduate study is not simply an extension of undergraduate work and more time needs to be given to the guidance of individual students.

With full agreement on the desirability of a sister-university relationship, in recognition of the competence and maturity of the staff as a whole, it was agreed that a one-to-one counterpart relationship was not desirable in the UPCO program. Rather, it was felt that much greater influence and impact would be obtained if all UPCA faculty in an area or discipline were counterparts to a visiting professor in that discipline. This resource area approach worked out very satisfactorily in several disciplines with excellent team efforts but was less than satisfactory in others. There were a few examples of a lack of involvement and less than full utilization of the talents and capabilities of the visiting professors. In any group of visiting professors it is obvious that some will function more effectively than others. Some have the personal qualities that enable them to gain the confidence and professional respect of their local colleagues more easily than others. At the same time, there were wide variations among the Filipinos in their interest and receptiveness to close working relationships with visiting professors. It varied, in general, with the experience and point of maturity of the faculty in a discipline, as well as the personality and interests of the individual staff member.

Operating funds for the UPCO program were disbursed rather widely on a project basis throughout the College. According to the view of those not directly participating in UPCO supported research, the use of these funds for joint research projects of visiting professors, graduate students and UPCA staff was occasionally in conflict with other financial needs of the department. It might be described as a feeling of envy or jealousy of those who were getting more financial support, and perhaps a failure to recognize the necessity for research priorities with concentration of efforts rather than spreading resources too thinly.

The period of greatest effort from visiting professors, graduate students and financial input into the cooperative program coincided with a growth of intensive nationalism and evidence of anti-Americanism among some of the Philippine people. Unrest among students and faculty, with resulting strikes and closing of the University at Diliman

and Los Baños caused serious disruptions in the normal functioning of the University for a period of two or three years and thus affected the UPCO program. Fortunately, there appeared to be little anti-Cornell feeling in the demonstrations at Los Baños.

Continuity of program activities in some disciplines was difficult because of the turnover of the UPCA staff, caused primarily by increasing competition from higher salaries outside the University. Loss of a key individual often required many months of training for a satisfactory replacement in a research or extension program activity. Also, there were examples where longer tenure of visiting professors would have provided greater impact from their services. But in a program with primary focus on education and training of people for teaching and research, the effectiveness of a visiting professor depends more upon his personal qualities and ability to get the confidence and support of his colleagues than upon the length of his period of service. Some of the most effective visiting professors were at both extremes in terms of length of assignment—short-term (3–6 months) assignments and long-term (up to 4½ years). The same was true for those who, for one reason or another, were less effective.

While graduate student participants were a successful component of the program, more critical screening and selection of both Americans and Filipinos might have helped to avoid the few cases where degree programs were not completed satisfactorily. The limited number (two) of Cornell graduate students who did not complete their theses had an understandable, unfavorable effect on members of the UPCA faculty who had devoted time, energy and knowledge to the research and had a right to expect the final reports and analysis of data. There was also an indication that higher priorities were given by UPCA candidates to Rockefeller Foundation scholarships than to UPCO assistantships. For a limited number of returning UPCA scholars, heavy teaching demands impeded their thesis research with resulting delays in completion of Ph.D. programs.

Most of the Filipino graduate participants held the rank of instructor without clear definition of their role in the institution which impeded to some extent their full interaction with Cornell graduate students. Larger numbers of UPCA graduate assistants in each of the departments would have improved mutual educational and research relationships with Cornell graduate assistants.



## Chapter XIII

# Mechanisms for Maintaining Linkages between Cornell and Los Baños

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## CHAPTER XIII

# Mechanisms for Maintaining Linkages between Cornell and Los Baños

The termination of the UPCO program on June 30, 1972, brought to a close almost 20 years of mutual collaboration and relationships between the Colleges of Agriculture of the University of the Philippines and Cornell University. From the rubble and ruin of World War II, with assistance from Cornell and the United States government during the period 1952-1960, the College at Los Baños was reborn, the Central Experiment Station was established, and a new faculty was developed to move ahead in teaching, research, and extension.

Upon this firm foundation, the UPCO program aided in the further development of the UPCA into an outstanding education and research center in Southeast Asia. In addition to growth in its teaching and research capabilities and as a center for graduate education in the agricultural sciences, the College moved into a strong position in national food and agricultural production programs.

As the end of formal relationships between Cornell and Los Baños approached, many questions and discussions took place on fiscal and organizational viability and on ways and means of maintaining linkages in the future. Some concerns were expressed over problems that would be encountered with the withdrawal of external grant support with the termination of the UPCO program. Will external aid and assistance be needed in the future to keep the momentum going? Will the Philippine government pay what it costs for the U.P. College of Agriculture to continue its development and provide the expertise and trained leadership for the Philippines and Southeast Asia? Should the University of the Philippines at Los Baños be left entirely on its own? Will SEARCA be able to fill the vacuum after Ford funds are no longer available and Cornell goes home? Is there any need for a continuing program of collaboration beyond 1972? If there is a need, what kind of a program should it be? These and many other questions were explored on numerous occasions with members of the faculty and administration of the UPCA as they considered plans for the future.

### *Potentials for Linkages*

There has always been a mutual feeling that the personal and professional relationships established over the past two decades between faculty members at Cornell and Los Baños will be maintained in one way or another. Communications between scientists and scholars and interchange of scientific knowledge are largely on a personal basis and come about as a result of mutual interests, respect and confidence. Administrative officials of the UPCA often stated:

“There will always be a close, mutual relationship between the University of the Philippines and Cornell University. The UPCA will want visiting professors, postdoctorals and others from Cornell to work with us in our teaching and extension activities and on research problems of mutual interest. We will want our staff members to go to Cornell for special programs and refresher courses.”

Cornell will welcome visiting professors on short- or long-term assignments from Los Baños. Exchanges of professors, graduate students and postdoctorals afford a means of maintaining direct linkages between the two universities, with mutual benefits to both. Professors might move in both directions for assignments of one or two semesters on sabbatic leaves. Short-term selection of distinguished lecturers and scientists, and consultants, chosen for eminence in their fields, adds to the intellectual climate of any university community.

Since the UPCA is now at the stage of development where it is providing Ph.D. level training in most disciplines, there might well be a shift from graduate fellowships for degree study abroad to post-doctoral scholarships and fellowships for refresher teaching and research experience of carefully selected, promising young staff members. Also, one or two semesters of studies abroad, especially in basic subjects not yet available at Los Baños, will continue to be a desirable procedure for doctoral candidates at the UPLB who have excellent potentials for academic positions.

International symposia, workshops, and seminars provide a mechanism for continuing linkages. For example, three scholars from the University of the Philippines were invited to present papers and participate in an international symposium, “Communication Strategies for Rural Development,” jointly sponsored by Cornell and the *Centro Internacional de Agricultura Tropical* (CIAT) held early in 1974 in Cali, Colombia.

### *Possibilities for New Approaches*

Various possibilities were considered for continuing relationships that would utilize some of Cornell's strengths to supplement the strengths of the U.P. College of Agriculture. It was agreed they should be different from the UPCA program with new and timely objectives

to build further the capacity of the UPCA for its increasing national and international roles. A package systems approach directed to priority problem areas of the country would help put agriculture into better perspective in terms of economic development.

Some of the problem areas defined by staff members of the UPCA and Cornell administration for in-depth approaches included food processing and marketing, field legumes, export crops, water management, crop protection, cropping systems, and agri-business. Another area that would provide for concentration in a discipline area would be a systems approach to feed and livestock, identifying the weaknesses and needs, and then mobilizing the resources and taking steps to solve the basic problems.

Initiatives for expansion into any of these or other areas must come from the faculty and administration of the University at Los Baños. Research, education, and training needs increasingly must be funded by the Philippine government and its agencies, and especially the Department of Agriculture and Natural Resources for action programs. But over and above these resources there is likely to be a need for continued external support, but at a lower level than has been the case in the past. To obtain such support that would make possible cooperative projects with Cornell, or other universities, will require innovative proposals with clear-cut objectives and goals. These projects should deal with high-priority problems that would include the U.P. College of Agriculture's calling upon the expertise of Cornell to work cooperatively in their solution. A procedure of this sort would provide a means of maintaining linkages between two universities and the long-time mutually profitable relationships that have been established.

An example of priority problem approach is one initiated for a two-year period on July 1, 1972 for research on agricultural marketing problems in the Philippines. In this case, a service agreement between Cornell University and the Ford Foundation makes available the services of Dr. L. B. Darrah as a Project Specialist in Agriculture to the Department of Agriculture and Natural Resources of the Philippines. A portion of Dr. Darrah's services are utilized in the continuation of his work in education and research on agricultural marketing with the University of the Philippines, College of Agriculture at Los Baños. The personnel for the marketing research unit are provided about equally by the College and the DANR. Priority is given to marketing problems in livestock, poultry feed grains, and fisheries, followed by those in fruit, vegetables, and rice.

### *UPCO Terminates*

June 30, 1972 marked the termination of the UPKO program and for the second time in 20 years of partnership it was time for the

Cornell staff to go home. Much was accomplished, but much remains to be done since a program in education and research is a never-ending task. We have confidence in the Filipinos who have the responsibilities to build an even stronger institution in the future.

The phasing-out was gradual and the final Cornell official to leave the UPCO barrio and the Los Baños campus was the last Project Leader, Dr. Edwin B. Oyer (who continued his international work at the Asian Vegetable Research and Development Center in Taiwan.)

On the last day, Professor Oyer wrote several letters of appreciation to Filipino colleagues. Among them were the following:

June 30, 1972

Dr. Salvador P. Lopez  
President  
University of the Philippines  
Diliman, Quezon City

Dear President Lopez:

In my mind, June 30, 1972 is a significant day. It is the day which marks the official termination of the UP-Cornell Graduate Education Program at Los Baños. Although termination activities will continue throughout the next year, I want to take this opportunity to express my personal thanks and appreciation to you, as President of the University, for your part in the implementation of our joint venture.

I believe I speak for all Cornellians who have participated in the program when I say that all our lives have been enriched by our contacts with the Filipino people and our minds broadened by increased understanding. It is our hope that our efforts have been of some value to the UP College of Agriculture. We all wish for you and the great University you administer the best of fame and fortune in future years.

Yours truly,  
E. B. Oyer  
Project Leader

June 30, 1972

Dean F. T. Orillo  
UP College of Agriculture  
College, Laguna

Dear Dean Orillo:

I wanted, on this official closing day of the UPCO project, to express my feeling of gratitude both personally, and on behalf of the College I represent, to you for your wholehearted cooperation in the administration of our joint venture. In reading over some of the past reports and recommendations that have been prepared by Cornellians, I realize anew that the role of the Dean has not been an easy one and that the recent intensification of student activism has made

your position even more difficult. Yet, on balance, there seems little doubt that the joint effort of our two Colleges has resulted in much good for both institutions.

While it may not be our role to evaluate the success or failure of our efforts, we have had to make the day-to-day decisions and I believe we can take pride in our efforts. While there is little doubt that there will be more problems in the future, I am sure we can be justifiably optimistic in the ability of trained minds and devoted hearts to solve future problems in the same reasoned and responsible way past problems have been solved.

While in some ways it is sad to see two decades of official relationships come to an end, it is right that it should be so. The many bonds of friendship that have been formed during these past years will linger. We at Cornell look forward to our continuing informal relationships with the UPCA and wish you the best of success in maintaining and increasing the position of leadership the College enjoys both nationally and regionally.

Yours truly,  
E. B. Oyer  
Project Leader

June 30, 1972

Dr. F. A. Bernardo  
Director  
Graduate Studies  
UPCA

Dear Dr. Bernardo:

The inevitable day has finally come when the joint venture of our two Colleges officially ends. Although our work is not yet done, I wanted to take this opportunity to express my appreciation to you for your help and understanding on the numerous occasions I have sought your advice and counsel. I, as all other Cornellians who have participated in the UPCA project, shall never forget the many pleasant 'happenings' that have marked our year with you.

While we terminate our official relationship with some sadness, we look forward to our continuing informal relationships in future years realizing that the established bonds of friendship and admiration will persist. One can view the future of UPCA with a comfortable optimism with the realization that men of your stature are in responsible positions to plot her course.

Again, my personal thanks and appreciation to you as a colleague and the best of luck in the future.

Yours truly,  
E. B. Oyer  
Project Leader

President's Office  
August 2, 1972

Professor E. B. Oyer  
Project Leader  
UP-Cornell Graduate Education Program  
College of Agriculture  
College, Laguna

Dear Professor Oyer:

Thank you for your letter of June 30, 1972 on the occasion of the official termination of the U.P.-Cornell Graduate Education Program at Los Baños. Needless to say, I agree with you in your assessment of the value of the joint project.

Over the years, stretching way back before the Second World War, the University of the Philippines and Cornell University have had an almost unbroken period of special relations in many fields of academic activity. Since many among our prewar faculty *pensionados* trained at Cornell, mainly though not exclusively in agricultural studies, it is hardly surprising that the UPCO Project should have involved our colleges of agriculture in a collaborative arrangement.

It may interest you to know that a distinguished President of Cornell University, Jacob Gould Schurman, introduced civil government in the Philippines at the turn of the century, and that two generations later a Cornell graduate, Dr. Vidal A. Tan, became President of the University of the Philippines.

As I express the appreciation of the University to you and others for your participation in the UPCO Project, let me at the same time convey the hope that it will not be the last, as it obviously was not the first, joint educational venture in a priority area of development between our sister institutions.

Sincerely yours,  
Salvador P. Lopez  
President

The departure of the Cornell staff from Los Baños brought to an end, at least formally, this unusual educational partnership in institution-building involving the development of people for service and leadership. Over this span of almost two decades, an environment was provided for the development of linkages between the agricultural colleges of two universities and many national and international agencies and organizations. It has been a remarkable, unique and innovative partnership in international education and research.

In recording his reflections on this long-term relationship in a letter to the author, Dr. F. F. Hill of the Ford Foundation said, "It seems to me that one can state the following axioms with respect to development:

1. Money by itself does not solve problems. Only men and women who know how to use money effectively make it valuable in the development process.
2. Institutions in which men and women can work effectively are essential to human progress. They provide individuals with the resources they need, including colleagues, to get jobs done. Man being mortal, they also provide links between one generation and the next.
3. Institutional development is slow business better measured in decades and generations than in years.

Cornell's agricultural programs in China and the Philippines not only illustrate these axioms but stand as monuments to all who worked to make them a success."

# Appendices

## APPENDIX A

# Contract Personnel and Fields of Work

Phase I: 1952-1960  
(From Cornell Except as Noted)

<i>Name and Address</i>	<i>Field</i>	<i>Arrival Date</i>	<i>Departure Date</i>
M. E. Robinson*	Project Leader	June 20, 1952	July 23, 1955
H. K. Hayes* University of Minnesota	Plant Breeding	Aug. 31, 1952	July 4, 1954
A. M. Goodman*	Agricultural Engineering	Sept. 17, 1952	July 1, 1954
C. A. Bratton	Agricultural Economics	Oct. 2, 1952	Aug. 20, 1953
G. C. Kent	Plant Pathology	Oct. 17, 1952	Mar. 29, 1954
N. C. Brady	Soils	July 9, 1953	Dec. 9, 1954
J. K. Loosli	Animal Husbandry	July 17, 1953	Aug. 1, 1954
L. S. Robertson Purdue University	Agricultural Economics	July 25, 1953	July 4, 1954
P. Work*	Vegetable Crops	Aug. 25, 1953	May 6, 1955
J. L. Brewbaker Brookhaven National Lab.	Plant Breeding	Oct. 1, 1953	May 3, 1955
A. G. Newhall	Plant Pathology	Mar. 1, 1954	Jan. 27, 1956
C. DelMar Kearnl*	Agricultural Economics	June 27, 1954	Apr. 23, 1956
P. R. Hoff*	Agricultural Engineering	Aug. 2, 1954	June 29, 1956
A. M. Brunson Purdue University	Plant Breeding	Sept. 5, 1954	Feb. 3, 1956
A. J. Sims University of Tennessee	Extension and Publications	Sept. 22, 1954	Mar. 22, 1956
K. L. Turk	Animal Husbandry	Oct. 15, 1954	Nov. 1, 1955

## APPENDIX A (Continued)

<i>Name and Address</i>	<i>Field</i>	<i>Arrival Date</i>	<i>Departure Date</i>
D. M. Proud	Home Economics	Oct. 20, 1954	June 15, 1955
J. G. Matthyse	Entomology	Oct. 26, 1954	Apr. 14, 1956
S. N. Fertig	Botany	Nov. 5, 1954	Apr. 9, 1956
M. G. Cline	Project Leader and Soils	Nov. 11, 1954	July 5, 1956
T. L. York*	Agronomy (Veg. Crops)	Apr. 7, 1955	Jan. 26, 1957
H. von Oppenfeld §	Agricultural Economics	June 12, 1955	Mar. 10, 1963
L. E. Nelson Mississippi State College	Soils	Aug. 3, 1955	June 29, 1957
S. C. Salmon U.S. Dept. of Agriculture	Plant Breeding	Oct. 11, 1955	July 1, 1957
G. W. Trimberger	Project Leader and Animal Husbandry	Oct. 18, 1955	July 1, 1957
C. S. Reddy Iowa State College	Plant Pathology	Feb. 6, 1956	Sept. 1, 1957
H. L. Everett	Plant Breeding	Feb. 7, 1956	July 7, 1957
R. W. Dean	Entomology	Mar. 1, 1956	July 28, 1957
R. A. Polson†	Education	Mar. 8, 1956	Aug. 10, 1956
W. B. Ward	Extension and Publications	June 17, 1956	July 1, 1957
H. E. Gray	Agricultural Engineering	June 24, 1956	Nov. 18, 1957
G. W. Hedlund	Agricultural Economics	June 27, 1956	July 10, 1957
R. B. Dickerson Pennsylvania State Univ.	Education	June 28, 1956	Nov. 21, 1957
L. D. Kelsey‡*	Extension and Community Development	Aug. 9, 1956	July 3, 1958
H. B. Knapp State University Agricultural and Technical Institute, Farmingdale	Project Leader	Mar. 4, 1957	June 20, 1960

\*Deceased

†Supported entirely by the Council on Economic and Cultural Affairs.

‡Supported jointly by the Council and the Contract.

§Supported by the Council to April, 1959, then jointly by Council and Contract.

APPENDIX A (*Continued*)

<i>Name and Address</i>	<i>Field</i>	<i>Arrival Date</i>	<i>Departure Date</i>
L. B. Darrah	Agricultural Economics	June 3, 1957	Dec. 13, 1958
R. W. Spalding	Animal Husbandry	June 11, 1957	Nov. 15, 1958
R. B. Musgrave	Agronomy	July 10, 1957	Dec. 12, 1958
Edward A. Lutz†	Local Government	July 12, 1957	July 3, 1958
B. V. Travis	Entomology	July 15, 1957	May 14, 1959
E. M. Palmquist University of Missouri	Botany	Aug. 12, 1957	Jan. 4, 1959
L. H. MacDaniels	Horticulture	Sept. 14, 1957	May 10, 1959
O. C. French	Agricultural Engineering	Feb. 5, 1958	Feb. 14, 1959
Harold R. Cushman	Agricultural Education	Feb. 6, 1958	July 13, 1959
L. A. Schafer Nebraska Wesleyan University	Plant Pathology	Mar. 8, 1958	Aug. 1, 1959
E. H. Tyner University of Illinois	Soils	Feb. 19, 1958	July 29, 1959
G. Fred Somers University of Delaware	College Organization & Administration	Oct. 31, 1958	Nov. 1, 1959
J. W. Dayton Massachusetts State University	Extension Service & Education	Dec. 3, 1958	June 20, 1960
W. C. Kelly	Horticultural Crops	Jan. 1, 1959	June 20, 1960
H. A. MacDonald	Field, Forage & Pasture Crops	Jan. 20, 1959	June 20, 1960
Wells M. Allred‡ Utah State University	Local Government	Aug. 9, 1959	May 31, 1961

†Supported entirely by the Council on Economic and Cultural Affairs.

‡Supported jointly by the Council and the Contract.

## APPENDIX B

### Fields in which Visiting Professors Served during Contract Period

Field	1952	1953	1954	1955	1956	1957	1958	1959	1960
<b>AGRONOMY</b>									
Vegetables		x	—	—	—	x			
Horticulture							x	—	x
Crop Patterns							x	—	x
<b>ANIMAL HUSBANDRY</b>									
General Nutrition		x	—	x					
Breeding					x	x	x		
<b>BOTANY</b>									
Weed Control				x	—	x			
Instruction						x	—	x	
<b>COLLEGE ORGANIZATION AND EXPERIMENT STATION ADMINISTRATION</b>									
							x	—	x
<b>ECONOMICS</b>									
General & Marketing	x	—	—	—	—	x	x	—	x
Research & Administration				x	—	—	—	—	x
<b>EDUCATION</b>									
Practice Teaching & Research						x	—	x	
<b>ENGINEERING</b>									
General	x	—	x						
Irrigation			x	—	x				
Grain Storage					x	—	x		
Small Tools for Farmers							x	—	x
<b>ENTOMOLOGY</b>									
Insecticides				x	—	—	x		
Instruction						x	—	x	
<b>EXTENSION &amp; PUBLICATIONS &amp; RURAL SOCIOLOGY</b>									
Publications				x	—	x	x		
Extension & Community Development						x	—	x	x
<b>HOME ECONOMICS</b>									
			x	—	x				
<b>LOCAL GOVERNMENT</b>									
						x	—	x	x



## APPENDIX C

### Members of the College Faculty Who Received Training Abroad Under ICA-NEC Sponsorship During the Period of Contract Operation, 1952-1960

<i>1953-1954</i>	<i>Degree Abroad</i>	<i>Field of Study</i>	<i>Position in 1960</i>	<i>Position in 1973</i>
Bondoc, L. O.	M.S. Cornell '55	Pomology	Instructor	Asst. Prof.
Bustrillos, A. D.	Cornell (non-degree program)	Electron Microscopy	Instructor	Asst. Prof.
Cedillo, V. G.	M.S. Cornell '55	Rural Sociology	PACD	Resigned
Escuro, P. B.*	M.S. Cornell '54	Agronomy	Asst. Prof.	Professor
Flores, T. G.*	M. Ed. Cornell '54	Extension	Asst. Prof.	Professor
Mensalvas, F. S.	M.S. Illinois '54	Animal Science	BAI	Resigned Asst. Director BAI
Quintana, E. U.†	M.S. Cornell '54	Agr. Economics	Asst. Prof.	Resigned
<i>1954-1955</i>				
Castillo, L. S.*	M.S. Cornell '55	Dairy Husbandry	Asst. Prof.	Professor
Davide, J. G.*	M.S. Cornell '55	Soil Science	Instructor	Resigned

APPENDIX C (Continued)

<i>1954-1955</i>	<i>Degree Abroad</i>	<i>Field of Study</i>	<i>Position in 1960</i>	<i>Position in 1973</i>
Garcia, G. V.	M.S. Cornell '55	Animal Science	Asst. Prof.	On detail
Raymundo, M. E.	M.S. Cornell '55	Soil Science	Instructor	Assoc. Prof.
Reyes, B. de los†	M.S. Cornell '55	Agr. Economics	Asst. Prof.	Professor
San Juan, M. O.*	M.S. Cornell '56	Plant Pathology	Instructor	Resigned
Santos, I. S.*	M.S. Nebraska '55	Plant Genetics	Instructor	Resigned
Sison, O. F.*	M. Ed. Cornell '55	Extension Education	Asst. Prof.	Professor
Ynalvez, L. A.	(Japan, 2 months)	Transferred to Forestry Products Institute 4/1/58		Retired
<i>1955-1956</i>				
Cadiz, T. G.*	M.S., L.S.U. '56	Vegetable Crops	Instructor	Asst. Prof.
Calo, L. L.	M.S. Cornell '56	Agronomy	Instructor	Resigned FAO, Tanzania
Corpuz, I. T.	M.S. Cornell '56	Soil Science	Instructor	Assoc. Prof.
Covar, R. R.	Cornell (non-degree program)	Chemistry	Instructor	Resigned
de Guzman, E. V.*	M.S. Cornell '56	Plant Physiology	Instructor	Assoc. Prof.
Jarmin, M. V.	M.S. Cornell '56	Agr. Economics	Asst. Prof. (Acting Head)	Professor (Retired)
Lantican, R. M.*	M.S. N. Carolina State '56	Plant Breeding	Instructor	Professor

APPENDIX C (Continued)

Pordesimo, A. N.*	M.S. Cornell '58	Plant Pathology	Asst. Inst.	Asst. Prof.
Reyes, T. T.	Travel Award	Laboratory Techniques	Research Fellow	Instructor
Sandoval, P. R.†	M.S. Minnesota '56	Agr. Economics	Asst. Prof.	Professor
Sta. Maria, J. B.	Cornell (non-degree program)	Agr. Engineering	Instructor	Resigned
<i>1956-1957</i>				
Baguilat, T. B.	M.S. Illinois '57	Economics	Instructor	Resigned
Calora, F. B.*	M.S. Cornell '57	Entomology	Instructor	Professor (Resigned)
Cruz, N. J.* (Mrs. N. Quebral)	M.S. Wisconsin '57	Agr. Journalism	Copy Editor	Assoc. Prof. Chairman, Dev. Communication
de Padua, D. B.*	MSAE, L.S.U. '58	Agr. Engineering	Res. Asst.	Assoc. Prof. Chairman, Agr. Engineering
Ela, R.	M.S. Cornell '58	Entomology	Asst. Inst.	Resigned
Quinon, V. L.	M.S. Hawaii '57	Plant Pathology	Asst. Inst.	Resigned
Santos, F. L.	M.S. Cornell '58	Agronomy	Asst. Inst.	Resigned
Vega, M. R.*	M.S. Cornell '57	Weed Science	Asst. Inst.	Assoc. Prof. (On leave as Asst. Director, IIRRI)

APPENDIX C (Continued)

<i>1956-1957</i>	<i>Degree Abroad</i>	<i>Field of Study</i>	<i>Position in 1960</i>	<i>Position in 1973</i>
Yniguez, A. D.*	M.S. N. Carolina State '57	Statistics	Instructor	Assoc. Prof. (Resigned)
Zamora, P. M.*	M.S. Cornell '57	Botany	Instructor	Assoc. Prof. U.P. Diliman
<i>1957-1958</i>				
Castillo, G. T.*	M.S. Penn State '58	Rural Sociology	Instructor	Professor
Clamohoy, L. L.	M.S. Cornell '58	Animal Husbandry	Instructor	Resigned
Gabriel, B. P.*	M.S. California '58	Entomology	Res. Asst.	Assoc. Prof.
Jamias, J. F.*	M.S. Wisconsin '58	Agr. Communications	Asst. Agr. Ed.	Assoc. Prof.
Mamaril, C. P.*	M.S. Wisconsin '58	Soil Science	Asst. Inst.	Asst. Prof. (On leave)
Obordo, R. A.*	Cornell (non-degree program)	Agronomy	Asst. Inst.	Asst. Prof.
Pena, C. Q.	M.S. Kansas State '58	Entomology	Asst. Inst.	Resigned
Sandoval, A. R.	M.S. Iowa State '58	Agr. Meteorology	Asst. Inst.	Resigned
Sta. Iglesia, J. M.†	M.S. Kentucky '59	Agr. Economics	Asst. Inst.	Asst. Prof.
Uy, J. B.	M.S. Cornell '58	Agr. Engineering	Asst. Supt. Const.; Inst.	Resigned
Valmayor, R. V.*	M.S. Cornell '58	Pomology	Asst. Inst.	Assoc. Prof.

APPENDIX C (Continued)

1958-1959

Bautista, R. C.	Cornell (non-degree program)	Agr. Engineering	Asst. Inst.	Resigned
Cruz, D. A.†	M.S. Cornell '60	Agr. Economics	Asst. Inst.	Asst. Prof. (On leave)
Fuente, R. K. de la	M.S. Hawaii '59	Botany	Asst. Inst.	Resigned
Eusebio, J. A.*	M.S. Iowa State '59	Animal Husbandry	Asst. Inst.	Assoc. Prof. Asst. for Research
Felizardo, B. C.	California-Berkeley (non-degree program)	Soil Science	Asst. Inst.	Asst. Prof.
Goseco, A. D.* (Mrs. Amparo Rigor)	M.S. Wisconsin '59	Home Economics	Asst. Inst.	Assoc. Prof. Chairman, Home Technology
Novero, E. S.* (Mrs. Emiliana Bernardo)	M.S. Kansas State '59	Entomology	Asst. Inst.	Asst. Prof. Chairman, Entomology
Novero, W. D.	M.S. Cornell '59	Education	Instructor	Resigned
Peredo, B. P.	Cornell (non-degree program)	Agr. Economics	Res. Asst.	Resigned
Santos, S. R., Jr.*	M.S. Cornell '59	Education	Asst. Inst.	Resigned

1959-1960

Asperilla, F. F. (Mrs. Fe Cagampang)	M.S. Cornell '60	Education	Instructor	Asst. Prof.
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## APPENDIX C (Continued)

<i>1959-1960</i>	<i>Degree Abroad</i>	<i>Field of Study</i>	<i>Position in 1960</i>	<i>Position in 1973</i>
Basas, C. B. (Mrs. C. B. Colanta)	M.S. Tennessee '60	Home Economics	Res. Asst.	Asst. Prof.
Carandang, D. A.	California-Berkeley (non-degree program)	Soil Science	Res. Asst.	Asst. Prof.
Cariaso, B. L.*	M.S. Oklahoma State '60	Entomology	Instructor	Assoc. Prof.
de Leon, D. D.	M.S. Texas A&M '60	Animal Parasitology	Instructor	Resigned
Feliciano, G. D.	M.S. Wisconsin '60	Agr. Communications	Copy Editor	Dean, Mass Communications U.P. Diliman
Manzanilla, E. B.*	M.S. Purdue '60	Chemistry	Instructor	Resigned
Palis, R. K.	Michigan State & Cornell (non-degree program)	Farm Management	Asst. Farm Supt.	Assoc. Prof.
Ragual, C. T.*	M.S. Iowa State '60	Agronomy	Asst. Inst.	Resigned
Ramos, F. T.	M.S. Cornell '60	Ext. Education	Instructor	Asst. Prof.

\* Supported later for Ph.D. Program by the Rockefeller Foundation.

† Supported later for Ph.D. Program by the Council for Economic and Cultural Affairs (Agricultural Development Council).

Note: In succeeding years, many of those listed above and other young staff members of the UPCA received scholarships and fellowships for advanced training abroad from foundations, international agencies and universities.

## APPENDIX D

# Numbers and Country of Origin of Foreign Students Enrolled in the College of Agriculture

From 1952-1953 to 1959-1960 Inclusive

	1952-1953 (1)	
China .....	1	(Chinese citizen residing in the Philippines)
	1953-1954 (5)	
China .....	4	(All Chinese citizens residing in the Philippines)
Thailand .....	1	(Freshman)
	1954-1955 (22)	
United States.....	4	(Freshman, 3; Junior, 1)
China .....	5	(Chinese citizens residing in the Philippines)
Thailand .....	1	(Freshman)
Vietnam .....	12	(All freshman under ICA scholarships)
	1955-1956 (33)	
United States.....	1	(Postgraduate)
China .....	6	(Chinese citizens residing in the Philippines)
Thailand .....	4	(Freshman, 3; Sophomore, 1)
India .....	1	(Special Postgraduate)
Vietnam .....	21	(Freshman, 11; Sophomore, 10) All under ICA scholarships.
	1956-1957 (40)	
United States.....	1	(Freshman)
Vietnam .....	18	(Freshman, 9; Sophomore, 9) All ICA scholars.
Indonesia .....	16	(Freshman) Under ICA, 7; Under Rockefeller, 9.
Pakistan .....	1	(Postgraduate)
Thailand .....	4	(Sophomore, 2; Senior, 1; Postgraduate, 1)

APPENDIX D (Continued)

1957-1958 (54)

COUNTRY	CLASSIFICATION						TOTAL	UNDER	
	Fresh	Soph	Junior	Senior	Special	Post Graduate		Rockefeller	ICA
United States.....	1				1		2		
Thailand.....			2	1			3		
Pakistan.....						1	1		
Trust Territory.....	2						2		
Vietnam.....			8	10			18		18
Indonesia.....	18	10					28	15	13
Total.....	21	10	10	11	1	1	54	15	31

1958-1959 (51)

COUNTRY	CLASSIFICATION						TOTAL	UNDER	
	Fresh	Soph	Junior	Senior	Special	Post Graduate		Rockefeller	ICA
Indonesia.....		16	11				27	14	13
Vietnam.....				8			8		8
United States.....	5		1				6		
Laos.....	3						3		3
Burma.....		2					2		
China.....		1					1		
Thailand.....				2			2		
Ceylon.....						1	1		
Trust Territory.....		1					1		
Total.....	8	20	12	10		1	51	14	24

APPENDIX D (Continued)

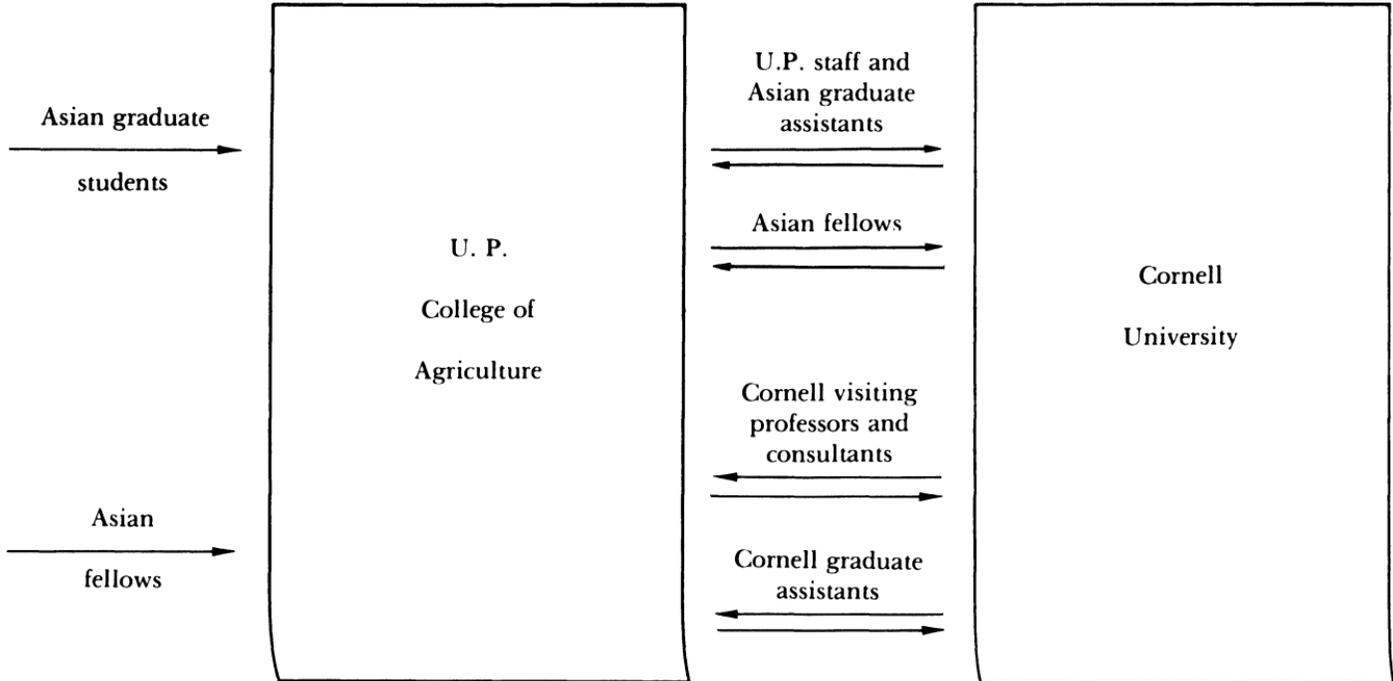
1959-1960 (34)

COUNTRY	CLASSIFICATION						TOTAL	UNDER	
	Fresh	Soph	Junior	Senior	Special	Post Graduate		Rockefeller	ICA
Indonesia .....		1	15	8			24	13	11
Laos .....		3					3		3
Vietnam .....				2			2		2
Korea .....						1	1		
United States .....					1		1		
China .....	1 <sup>1</sup>			1			2		
Sarawak .....			1				1		
<b>Total.....</b>	<b>1</b>	<b>4</b>	<b>16</b>	<b>11</b>	<b>1</b>	<b>1</b>	<b>34</b>	<b>13</b>	<b>16</b>

<sup>1</sup>Chinese citizen residing in the Philippines.

# APPENDIX E

## Operational Plan U.P.-Cornell Graduate Education Program



## Graduate Education Program (Ph.D.) for Cornell Graduate Assistants

<i>Program Phase</i>	<i>Time Required (Approximate)</i>	<i>Expected Accomplishments</i>
1. Cornell phase: M.S. degree work; course work for Ph.D.	2-3 years	Maximum concentration on formal course work and training for research and teaching in the Philippines, complete work for M.S. degree. Ideally, research for M.S. should be preparatory for Ph.D. study in the Philippines. Research and teaching duties are given each assistant and orientation for studies in the tropics. Take language exams. In most cases qualifying and A exams are taken.
2. U.P. phase of Ph.D. program	2 years	Some course work on tropical agriculture. Concentration on Ph.D. research program involving a problem of concern in Southeast Asia. Participants assist in the training of Filipino students since they have teaching as well as research responsibilities. They work under the direction of Cornell professors (in some cases jointly with Filipino professors).
3. Completion of Cornell phase of Ph.D. program	1 year	Write Ph.D. thesis and publish research findings. Take graduate examinations on thesis and subject matter. Assist in the orientation and recruitment of additional graduate assistants.

## Graduate Education Program (Ph.D.) for Asian Graduate Assistants

<i>Program Phase</i>	<i>Time Required (Approximate)</i>	<i>Expected Accomplishments</i>
1. M.S. degree work in the Philippines	2 years	Completion of formal course work, research, and thesis for M.S. Preparation for Ph.D. program, including initial planning phases of research work. Teaching and research experience obtained under Filipino and Cornell staff.
2. Cornell phase of Ph.D. program	2 years	Completion of formal course work and literature review and detailed planning of research program for Ph.D. degree. Graduate examinations on subject matter will be completed. Research and teaching experience obtained. Meet requirements for foreign languages.
3. U.P. phase of Ph.D. program	1½-2 years	Complete research work for the Ph.D. degree. Write Ph.D. thesis and publish research findings. Take final thesis examination for the Ph.D. degree.

## APPENDIX F

# Cornell Visiting Professors and Consultants at Los Baños

UPCO, 1963-1972

### ANIMAL SCIENCES

#### *Visiting Professors*

	<i>Dates</i>	<i>Discipline</i>
J. C. Miller*	7/29/67-8/5/69	Animal Science

#### *Consultants*

J. K. Loosli	2/7/66-7/8/66	Animal Nutrition
M. L. Scott	2/28/67-5/28/67 9/20/68-1/5/69	Poultry Nutrition
G. H. Schmidt	9/6/68-12/9/68	Animal Physiology

### PLANT SCIENCES

#### *Visiting Professors*

R. B. Musgrave	7/11/64-7/2/66	Field Crops Physiology
J. E. Knott	8/13/64-7/16/67	Vegetable Physiology
R. M. Smock	6/25/66-7/1/67	Pomology-Fruit Crops
J. C. Sentz †	7/9/66-5/18/68	Field Crops Breeding
D. H. Wallace	7/3/67-3/14/69	Vegetable Breeding
R. Feuer	12/31/67-4/22/72	Field Crops Production
H. M. Munger	2/9/69-3/26/70	Vegetable Breeding

#### *Consultants*

H. M. Munger	1/20/64-2/29/64	Vegetable Breeding
L. V. Crowder	9/23/66-12/16/66 12/12/68-3/22/69	Field Crops Breeding
R. L. Plaisted	1/15/68-2/25/68	Field Crops Breeding
R. B. Musgrave	12/29/70-4/18/71	Field Crops Physiology

\*Oregon State University

†University of Minnesota

## APPENDIX F (Continued)

## PHYSICAL SCIENCES—NATURAL RESOURCES

<i>Visiting Professors</i>	<i>Dates</i>	<i>Discipline</i>
G. Levine	9/24/63—5/18/65 8/17/68—5/25/69	Agr. Eng.—Water Management
B. L. Herrington	7/14/64—6/1/67	Food Chemistry
D. R. Strength ‡	7/31/67—7/8/69	Biochemistry
D. R. Bouldin	7/2/68—6/14/69	Soil Science
J. H. Hathcock §	6/30/69—6/18/71	Biochemistry and Nutrition
R. G. Young	6/29/68—10/16/69	Agr. Chemistry

*Consultant*

G. Levine	1/7/72—2/13/72	Agr. Eng.—Water Management
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## FOOD AND NUTRITION

*Visiting Professors*

C. S. Pederson	7/1/65—7/16/67	Food Science—Microbiology
K. H. Steinkraus	7/4/67—6/15/69	Food Science—Microbiology
M. C. Bourne	3/31/69—3/31/71	Food Science & Chemistry

*Consultants*

D. B. Hand	12/15/63—2/21/64	Food Science
K. H. Steinkraus	4/24/64—5/1/64	Food Science

## SOCIO-ECONOMICS AND COMMUNICATIONS

*Visiting Professors*

M. C. Bond II	9/1/63—8/16/64	Extension
A. E. Durfee	7/3/64—1/16/66	Extension
R. Barker	9/24/65—7/1/67	Agr. Economics
H. R. Ainslie	1/3/66—7/18/67	Extension
F. K. T. Tom	7/3/67—11/25/68	Agr. Education
H. R. Cushman	8/1/68—6/20/70	Agr. Education
L. B. Darrah	7/4/70—5/12/72	Agr. Economics

*Consultants*

R. A. Polson	10/30/64—1/28/65	Rural Sociology
W. B. Ward	6/3/65—8/30/65	Communications
L. B. Darrah	6/23/68—12/12/68	Agr. Economics

‡Auburn University

§Recent Cornell Ph.D.

II Served the previous year supported by grant from the Agricultural Development Council.

APPENDIX F (*Continued*)

## PLANT AND ANIMAL PROTECTION

<i>Visiting Professors</i>	<i>Dates</i>	<i>Discipline</i>
L. D. Uhler	7/9/66—12/15/67	Entomology
E. H. Glass	7/17/66—12/20/67	Entomology
O. E. Schultz	6/29/69—6/2/71	Plant Pathology
R. G. Young	6/29/68—10/16/69	Entomology

*Consultants*

B. V. Travis	2/1/64—4/29/64	Entomology
G. C. Kent	8/30/65—11/28/65	Plant Pathology
D. Pimentel	9/19/67—11/13/67	Entomology
H. D. Thurston	1/15/68—2/25/68	Plant Pathology

## HOME TECHNOLOGY

*Consultants*

Helen Canoyer	1/1/67—1/23/67	Home Economics
Mary G. Wood	1/1/67—3/3/67	Home Economics
Sara E. Blackwell	1/12/68—3/23/68	Education

## PROJECT LEADERS

N. C. Brady	9/9/63—11/9/63	Soil Science
K. L. Turk	11/4/63—1/9/64	Int. Agriculture
R. Bradfield	1/1/64—7/5/64	Soil Science
H. L. Everett	7/2/64—1/8/66	Plant Breeding
G. W. Trimberger	1/3/66—11/28/67	Animal Husbandry
J. F. Metz, Jr.	9/4/67—7/21/69	Agr. Economics
M. T. Vittum	6/30/69—7/24/71	Vegetable Crops
E. B. Oyer	7/4/71—7/15/72	Vegetable Crops

## ADMINISTRATIVE SERVICES

*Consultants*

R. L. Walsh	3/4/64—5/1/64	Business Affairs
H. Gandleman #	3/4/64—5/1/64	Institutional Management
W. Powell	10/3/64—1/23/65	Library
	2/26/67—3/24/67	
	10/7/69—11/15/69	
L. W. Zuidema	3/13/67—4/1/67	Administration

#Maritime College, State University of New York

APPENDIX F (*Continued*)

## ADMINISTRATIVE REVIEWS

<i>Visiting Profesors</i>	<i>Dates</i>	<i>Discipline</i>
C. E. Palm	10/28/64—11/11/64 1/28/67—3/24/67 11/4/68—11/17/68 1/16/71—1/28/71	Dean
J. A. Perkins	8/14/65—8/19/65	President
W. K. Kennedy	1/6/66—2/28/66	Director of Research
D. W. Barton	1/14/68—2/18/68	Director, Experiment Station (Geneva)
D. R. Corson	1/30/68—2/10/68	Provost
K. L. Turk	10/23/64—11/12/64 2/19/66—3/18/66 4/27/67—5/21/67 1/27/68—2/27/68 1/23/69—2/18/69 1/4/70—2/8/70 3/27/72—4/25/72	Director, International Agriculture

## APPENDIX G

### Cornell Graduate Assistants

UPCO, 1963-1972

#### Degrees Completed

##### ANIMAL SCIENCES

1. William L. Johnson—Ph.D., September 1966

Thesis: The Nutritive Value of *Panicum Maximum* (Guinea Grass) for Cattle and Water Buffaloes in the Tropics.

Present Position:<sup>1</sup> Assistant Professor  
Department of Animal Science  
School of Agriculture and Life Sciences  
North Carolina State University  
Raleigh, North Carolina 27607

2. Robert J. Grant—Ph.D., June 1973

Thesis: Digestibility of Napier Grass by Philippine Cattle and Water Buffaloes and *in Vitro* Digestibility and Composition of Philippine Feedstuffs.

Present Position: Animal Health Department  
Hoechst Pharmaceutical  
Somerville, New Jersey 08876

##### PLANT SCIENCES

3. Charles A. Francis—M.S., June 1967; Ph.D., September 1970

Thesis (M.S.): Downy Mildew Disease of Maize in the Philippines.

Present Position: Maize Breeder  
Centro Internacional de Agricultura  
Tropical (CIAT)  
Apartado Aereo 67-13  
Cali, Colombia

<sup>1</sup>In all cases Present Position refers to 1973.

## APPENDIX G (Continued)

4. Gary H. Heichel—Ph.D., June 1968  
Thesis: Intervarietal Photosynthetic Investigations on Corn (*Zea Mays* L.):  
I. Varietal Differences in Net Photosynthesis.  
II. Photosynthetic Response to Leaf Water Potential.  
Present Position: Associate Plant Physiologist  
Department of Ecology and Climatology  
Connecticut Agricultural Experiment Station  
Box 1106, New Haven, Connecticut 06504
5. Anthony F. E. Palmer—Ph.D., February 1969  
Thesis: Translocation Patterns of 14-C Labelled Photosynthate in the Corn Plant (*Zea Mays* L.) during the Ear-Filling Stage.  
Present Position: Research and Production Agronomist  
International Maize and Wheat Improvement Center (CIMMYT)  
Apdo. Postal 6-641, Mexico 6, D.F.  
(Presently assigned to: The Ford Foundation, P.O. Box 1043, Islamabad, Pakistan)
6. Hans Christian Wien, Ph.D., September 1971  
Thesis: The Influence of Spacing on Light Interception, Growth and Seed Yield of *Phaseolus Vulgaris* L. Under Temperate and Tropical Conditions.  
Present Position: Plant Physiologist  
Grain Legume Research Program  
International Institute of Tropical Agriculture  
P.M.B. 5320  
Ibadan, Nigeria
7. J. R. Novak—Ph.D., June 1972  
Thesis: A Study of the Effects of Environmental and Genetic Factors on Sex Expression in Cucumber, *Cucumis Sativus* L.  
Present Position: Assistant Professor  
Department of Horticulture  
Louisiana State University  
Baton Rouge, Louisiana 70803
8. Roger D. Dutcher—Ph.D., September 1972  
Thesis: Factors Influencing Flower Induction in 'Carabao' Mango (*Mangifera Indica* L.) in the Philippines.  
Present Position: Technical Representative  
Agricultural Chemicals Development  
Uniroyal Chemical Company  
Room 802, Cathay Building  
Singapore 9

APPENDIX G (*Continued*)

## PHYSICAL SCIENCES—NATURAL RESOURCES

## 9. Pedro A. Sanchez—Ph.D., June 1968

Thesis: Rice Performance Under Puddled and Granulated Soil Cropping Systems in Southeast Asia.

Present Position: Associate Professor and Leader,  
Tropical Soils Program  
Department of Soil Science  
School of Agriculture and Life Sciences  
North Carolina State University  
Raleigh, North Carolina 27607

10. Fred R. Magdoff—Ph.D. candidate in soils, was at Los Baños 9/23/65—4/12/66, separated from project, and returned to Cornell for completion of degree.

## 11. Jacob Kampen—Ph.D., February 1971

Thesis: Water Losses and Water Balance Studies in Lowland Rice Irrigation.

Present Position: Agricultural Engineer  
International Crops Research Institute  
for Semi-Arid Tropics (ICRISAT)  
1-11-256 Begumpet  
Hyderabad 500016  
India

## 12. Thomas H. Wickham—Ph.D., February 1972

Thesis: Water Management in the Humid Tropics—A Farm-Level Analysis.

Present Position: Associate Economist  
International Rice Research Institute (IRRI)  
M.C.C., P.O. Box 1300  
Makati, Rizal D-708  
Philippines

## FOOD AND NUTRITION

## 13. Arthur J. Maurer—Ph.D., February 1971

Thesis: Factors Affecting the Drying, Stability, and Rehydration of Freeze-Dried Chicken Meat.

Present Position: Assistant Professor  
Department of Poultry Science  
College of Agriculture  
University of Wisconsin  
Madison, Wisconsin 53706

## APPENDIX G (Continued)

## SOCIO-ECONOMICS AND COMMUNICATIONS

14. Albert J. Nyberg—Ph.D., June 1968  
 Thesis: The Philippine Coconut Industry.  
 Present Position: Visiting Professor of Economics  
 Gadjah Mada University  
 The Rockefeller Foundation  
 P. O. Box 63  
 Jogjakarta, Indonesia
15. Donald E. Voth—Ph.D., September 1969  
 Thesis: Social Mobility in Dumaguete Area: A Longitudinal Study.  
 Present Position: Assistant Professor  
 Community Development Services  
 Southern Illinois University  
 Carbondale, Illinois 62901
16. Gerald C. Wheelock—Ph.D., June 1972  
 Thesis: Structural Determinants of the Distribution of a Rural Credit Institution in the Philippines, 1952-1970.  
 Present Position: Associate Professor  
 Department of Agricultural Education  
 and Agricultural Economics  
 Alabama A & M College  
 Huntsville, Alabama
17. Charles A. Robertson—Ph.D., January 1973  
 Thesis: Economic Analysis of Ground Water Irrigation in Nueva Ecija, Philippines.  
 Present Position: Senior Agricultural Economist  
 Land Resources Division  
 Overseas Development Administration  
 Tolworth Tower  
 Surbiton, Surrey, England
18. Bruce M. Koppel—Ph.D., June 1973  
 Thesis: Society, Policy, and Technology: An Analysis of Agricultural Change in the Western Philippines, 1950-1970.  
 Present Position: Assistant Researcher  
 East-West Technology and Development Institute  
 East-West Center  
 Honolulu, Hawaii 96822

## PLANT AND ANIMAL PROTECTION

19. Eldon I. Zehr—Ph.D., September 1969  
 Thesis: Distribution, Economic Hosts, and Variability of *Pseudomonas Solanacearum* E. F. Smith in the Philippines.

## APPENDIX G (Continued)

**Present Position:** Assistant Professor  
 Department of Plant Pathology and Physiology  
 College of Agriculture and Biological Sciences  
 Clemson College  
 Clemson, South Carolina 29631

## Degrees Not Completed

20. Isao Fujimoto—Ph.D. Candidate  
**Research for thesis:** Community Development as a Social Movement.  
**Present Position:** Lecturer in Rural Sociology  
 Department of Applied Behavioral Sciences  
 College of Agricultural and Environmental Sciences  
 University of California  
 Davis, California 95616
21. Douglas R. Pickett—Ph.D. Candidate  
**Research for thesis:** Role Perceptions of Extension Staff in the Philippines and Implications for Professional Training.  
**Present Position:** Senior Extension Associate  
 Cooperative Extension  
 New York State College of Agriculture and Life Sciences  
 Cornell University  
 Ithaca, New York 14850
22. Warren R. Philipson—Ph.D. Candidate\*  
**Research for thesis:** Analysis and Characterization of Philippine Crop Occurrence in Relation to Climatic and Soil Factors.  
**Present Position:** Research Associate  
 Department of Environmental Engineering  
 Cornell University  
 Ithaca, New York 14850
23. Alan C. Early—Ph.D. Candidate\*  
**Thesis:** The Influence of Water Management on Optimal Operating Policies for Sugar Cane Districts in the Philippines.  
**Present Position:** Assistant Professor of Agricultural Engineering  
 Department of Agricultural Engineering  
 Colorado State University  
 Fort Collins, Colorado 80521

\*Degree to be conferred in January 1975.

## APPENDIX H

# UPCA Visiting Professors and Consultants at Cornell

UPCO, 1963-1972

<i>Visiting Professors</i>	<i>Dates</i>	<i>Discipline</i>
T. G. Flores	7/65-7/66	Communication Arts
L. S. Castillo	7/66-7/67	Animal Science
Gelia T. Castillo*	7/66-7/67	Rural Sociology
R. M. Lantican	8/67-10/68	Field Crops Breeding
<i>Consultants</i>		
L. J. Villanueva †	5/9/65-7/12/65	Food Science
A. P. Aglibut	8/9/65-8/21/65	Business Affairs
A. D. Yniguez	9/9/66-11/11/66	Applied Mathematics
<i>Administrative Services</i>		
M. G. Añonuevo	10/1/66-10/15/66	Program Operations
<i>Administrative Visits</i>		
D. L. Umali	5/27/63-6/30/63 9/66 2/68	Vice-President and Dean
Carlos P. Romulo	11/68	President
F. A. Bernardo	10/26/69-11/8/69	Director, Graduate Studies
F. T. Orillo	10/23/70-11/7/70	Dean

\*Served as visiting professor but not on UPKO funds

†Died suddenly while at the Geneva Campus

## APPENDIX I

### Asian Participants

UPCO, 1963-1972

<i>Visiting Professors</i>	<i>Country</i>	<i>Dates</i>	<i>Discipline</i>
S. C. Hsieh	Taiwan	1/66—5/67	Agr. Economics
C. W. Chang	Taiwan	8/66—4/68 9/68—7/69	Agr. Education
T. S. C. Wang	Taiwan	6/68—5/69	Soils
<i>Consultant</i>			
Chuanchom Chandrapauraya	Thailand	6/27—12/67	Home Technology
<i>Graduate Assistants</i>			
H. Y. Lu	Taiwan	5/63—5/65 5/65—5/68	M.S. Extension Education Ph.D.
Ph.D. Thesis: Some Socio-economic Factors Affecting the Implementation at the Farm Level of a Rice Production Program in the Philippines.			
S. H. Liao	Taiwan	8/65—8/67	M.S. Agr. Economics
Thesis: Factors Affecting Productivity and Adoption of Improved Farm Practices in Rice Farms.			
Rusli Hakim	Indonesia	7/65—3/69	Ph.D. Agr. Economics
Thesis: An Evaluation of Mass Selection and Family Selection for Corn Improvement in a Tropical Environment.			

## APPENDIX J

# UPCA Graduate Assistant Participants in the United States<sup>1</sup>

UPCO, 1963-1972

### ANIMAL SCIENCE

1. Mario M. Labadan—Ph.D.,<sup>2</sup> Animal Nutrition, 9/64—2/67  
Thesis: Studies to Evaluate and Improve Utilization of Local By-products for Poultry Feeding.  
Position\*: Operation Manager, Agribusiness Division, Republic Flour Mills  
(Resigned from UPCA)
2. Vicente G. Momongan—Ph.D.,<sup>2</sup> Animal Physiology, 9/65—3/68  
Thesis: The Effect of Milking Stimulus and State of Lactation on the Levels of Endogenous Oxytocin in the Blood during the Milking Process.  
Position: Assistant Professor, Animal Science, UPLB
3. Reynaldo Resurreccion—M.S., Avian Medicine, 1/70  
Candidate for Ph.D. in Veterinary Virology  
Position: Graduate Assistant, College of Veterinary Medicine, University of Georgia

### PLANT SCIENCES

4. Emil Javier—Ph.D.,<sup>2</sup> Plant Breeding, 9/64—7/66  
Thesis: The Phenology, Flowering Habits and Mode of Reproduction of *Pennisetum Purpurem* Schumacher., *Brachiaria mutica* (Forsk) Stapf., *Panicum maximum* Jacq.  
Position: Assistant Professor, Agronomy, UPLB
5. Noel Mamicpic—Ph.D.,<sup>2</sup> Crop Science, 9/64—9/66  
Thesis: Characterization and Evaluation of Variability in Mungbean (*Phaseolus Aureus* Roxb.) as Basis for Improvement.  
Position: Assistant Professor and Chairman, Agronomy, UPLB

APPENDIX J (*Continued*)

7. Percy Sajise—M.S.,<sup>2</sup> Plant Ecology, 9/67—8/70  
 Thesis: A Review of Light as an Ecological Factor in Plant Competition.  
 Position: Assistant Professor and Chairman, Botany, UPLB
6. Adolfo Necesito—Ph.D.,<sup>2</sup> Crop Science, 9/65—1/69  
 Thesis: Soil-Plant-Water Relation Studies of Virginia Tobacco in the Philippines.  
 Position: Assistant Professor, Agronomy, UPLB
8. Elpidio Rosario—Ph.D.,<sup>2</sup> Crop Science, 8/67—8/70  
 Thesis: Physiological Aspects of Photosynthesis Differences in Relation to Yield Exhibited by some Sugarcane Varieties.  
 Position: Assistant Professor, Agronomy, UPLB
9. Jose R. Deanon, Jr.—Vegetable Crops, 6/67—7/69  
 (Returned to Los Baños without completing his Ph.D. program.)  
 Position: Assistant Professor, Agronomy, UPLB

## PHYSICAL SCIENCES—NATURAL RESOURCES

10. Ernesto del Rosario—M.S., Chemistry, 2/64—2/66  
 Thesis: Temperature Dependence of the Conductance of Tetrabutylammonium Fluoroborate in Pental-acetonitrile.  
 —Ph.D., Chemistry, 8/67—7/70  
 Thesis: Kinetic Studies on Ribonuclease A and Mitochondrial Malate Dehydrogenase.  
 Position: Assistant Professor, Chemistry, UPLB
11. Serafin Talisayan—M.S., Physical Biology, 2/64—2/66  
 Thesis: Contributions to Multi-tracer Assay Techniques using Gamma Ray Spectra.  
 —Ph.D., Physical Biology, 8/67—9/72  
 Thesis: A Quantitative Study of Strontium Metabolism in Bone.  
 Position: Assistant Professor and Chairman, Applied Mathematics, UPLB

\*In all cases position refers to 1973.

<sup>1</sup> All studied at Cornell except as indicated.

<sup>2</sup> Thesis research at Los Baños; degree from Cornell.

APPENDIX J (*Continued*)

12. Senen Miranda—M.S., Agricultural Engineering, 9/65—8/67  
 Thesis: Determination of Oat Grain Moisture by the Neutron Scattering Technique.  
 —Ph.D.,<sup>2,3</sup> Agricultural Engineering, 7/69—7/71  
 Thesis: The Effects of Physical Control Parameters on Philippine Lowland Rice Irrigation System Performance.  
 Position: Assistant Professor, Agricultural Engineering, UPLB
13. Carlito Barril—M.S., Chemistry, 9/66—9/68  
 Thesis: Elucidation of the Influence of Pressure Drop on the Efficiency of Gas Chromatographic Columns.  
 Position: Assistant Professor, Chemistry, UPLB
14. Maximo de Vera—M.S., Agricultural Engineering, 9/68—9/70  
 No Thesis  
 Position: Instructor, Agricultural Engineering (Current doctoral candidate at UPLB)
15. Igmidio Corpuz—Ph.D.,<sup>2</sup> Soils, 9/65—9/67  
 Thesis: A Tillage and Nitrogen Fertilization Study of Some Upland Crops Grown on Irrigated Lipa Clay Loam.  
 Position: Associate Professor, Soil Science, UPLB

## FOODS AND NUTRITION

16. Jesus Melgar—M.S., Food Science, 9/65—6/68  
 Thesis: Measurement of Thermal Conductivity of Meats.  
 Position: Pure Foods, Inc., Philippines (Resigned from UPCA)
17. William Fernandez—Ph.D.,<sup>2,3</sup> Microbiology, 9/66—9/68  
 Thesis: Microbiology of the Coconut.  
 Position: Assistant Professor, Plant Pathology, UPLB

## SOCIO-ECONOMICS AND COMMUNICATIONS

18. Purificacion L. Ona—Ph.D.,<sup>4</sup> Agricultural Economics, 3/67—11/69  
 Thesis: Changes in Price and Income Elasticities of Demand for Dairy Products.
19. C. P. Juliano—Ph.D.,<sup>2</sup> Extension Education, 8/67—1/70  
 Thesis: Some Selected Factors Associated with Empathic Ability of Farm Management Technicians in the Philippines.  
 Position: Assistant Professor, Extension Education, UPLB

APPENDIX J (*Continued*)

20. Edgardo D. Dosayla—M.S.,<sup>5</sup> Agricultural Economics, 9/69—7/70  
Thesis: Livestock Marketing in the Philippines.  
Position: On special detail from UPCA to NFAC

## PLANT AND ANIMAL PROTECTION

21. L. C. Rimando—Entomology, 6/69—6/70  
(Returned to the UPCA without completing courses for Ph.D. program.)  
Position: Assistant Professor and Chairman, Life Sciences, UPLB

<sup>2</sup>Thesis research at Los Baños; degree from Cornell.

<sup>3</sup>Candidate for degree. Degree to be conferred to Miranda in January 1975.

<sup>4</sup>Candidate for degree at Pennsylvania State University. Married an American and did not return to the Philippines.

<sup>5</sup>Degree from the UPLB.

## APPENDIX K

# UPCA Staff on UPCHO Fellowships for Study Abroad

1963-1972

### PLANT SCIENCES

1. Salvador Bautista—Ph.D., Landscape Architecture, 9/65—9/69  
University of California  
Position:<sup>2</sup> Assistant Professor, Agronomy, UPLB
2. Ofelia K. Bautista—Ph.D.,<sup>1</sup> Vegetable Crops, 11/71—7/72  
University of California  
Position: Instructor, Agronomy, UPLB
3. Antonio Mercado—Ph.D.,<sup>1</sup> Plant Breeding, 1/72—9/72  
CIMMYT, Mexico  
Purdue University  
Position: Instructor, Agronomy, UPLB

### PHYSICAL SCIENCES—NATURAL RESOURCES

4. Emerico R. Mendoza—Ph.D.,<sup>1</sup> Food Engineering, 8/71—6/73  
Cornell University  
University of Massachusetts  
Position: Instructor, Agricultural Engineering, UPLB
5. Carlito Barril—Ph.D.,<sup>1</sup> Insecticide Chemistry, 8/71—1/72  
Cornell University  
Position: Assistant Professor, Department of Chemistry,  
UPLB

### SOCIO-ECONOMICS AND COMMUNICATIONS

6. Bonifacio Bangcaya—Ph.D., Guidance and Counseling, 9/66—1/70  
University of Minnesota  
Position: First National City Bank of New York  
Makati, Rizal
7. Higinio Ables—Ph.D., Education, 9/66—5/69  
Michigan State University  
Position: Assistant Professor, Institute of Mass Communi-  
cations, UP Diliman

## APPENDIX K (Continued)

8. Prospero Covar—Ph.D., Sociology and Anthropology, 9/66—7/69\*  
University of Arizona  
Position: Head, Training Department, Agrarian Reform Institute, UPLB
9. Rhodelia Lozada—Ph.D., Psychometrics, 9/66—7/70  
Purdue University  
Position: Assistant Professor and Coordinator, Office of Student Affairs, UPLB
10. Maximo Baradas—M.S., Extension Education, 9/66—6/68  
University of Wisconsin  
Position: Instructor, Agricultural Engineering, UPLB (Doctoral candidate, University of Wisconsin)
11. Narciso R. Deomampo—Ph.D.,<sup>1</sup> Agricultural Economics, 8/71—8/72  
Cornell University  
Position: Assistant Professor, Agricultural Economics, UPLB
12. Leonora Gregorio—M.S., Library Science, 4/67—6/68  
University of Pittsburgh  
Position: Librarian and Officer-in-Charge, UPLB Library
13. Sotero L. Lasap, Jr.—Ph.D., Agricultural Education, 2/70—9/71  
University of Maryland  
Position: Assistant Professor, Agricultural Education Principal, UP Rural High School
14. Virginia M. Lasap—M.S., Counseling, 2/70—9/71  
University of Maryland  
Position: Instructor, Agricultural Education, UPLB

## PLANT AND ANIMAL PROTECTION

15. Soledad Rivera—Ph.D., Entomology-Zoology, 1/68—9/71  
Pennsylvania State University  
(Resigned as Assistant Professor, Department of Entomology, UPCA)
16. Venus J. Calilung—Ph.D.,<sup>1</sup> Entomology, 10/71—3/72  
Visited several universities in the U.S., England, and other parts of Europe.  
Position: Assistant Professor, Entomology, UPLB

\*Discontinued under UPCO July, 1969

<sup>1</sup>Ph.D. phase at the UPCA: supplementary studies abroad.

<sup>2</sup>In all cases position refers to 1973.

APPENDIX L

Final Summary

Ford Foundation Grant Funds to Cornell University  
for  
UP—Cornell Graduate Education Program

1963 to 1973

RECEIPTS	<u>1963-64</u>	<u>1964-65</u>	<u>1965-66</u>	<u>1966-67</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u>	<u>1970-71</u>	<u>1971-72</u>	<u>1972-73</u>	<u>SUMMARY</u>
New Ford Foundation Funds .....	485,000.00	441,000.00	213,500.00	375,000.00	515,405.16	557,902.07	428,942.77	308,500.00	185,250.00	—	3,510,500.00
Balance from Previous Year .....	—	<u>276,127.18</u>	<u>419,957.85</u>	<u>190,344.39</u>	<u>66,967.72</u>	<u>43,624.58</u>	<u>62,781.22</u>	<u>45,961.98</u>	<u>14,704.64</u>	<u>26,472.53</u>	—
Total Ford Foundation Funds .....	485,000.00	717,127.18	633,457.85	565,344.39	582,372.88	601,526.65	491,723.99	354,461.98	199,954.64	26,472.53	—
Other Funds .....	—	<u>\$1,800.00<sup>1</sup></u>	—	—	—	—	—	—	<u>24,531.28<sup>2</sup></u>	<u>32,247.72<sup>2</sup></u>	<u>58,579.00</u>
Total Funds Available .....	485,000.00	718,927.18	633,457.85	565,344.39	582,372.88	601,526.65	491,723.99	354,461.98	224,485.92	58,720.25	3,569,079.00 <sup>3</sup>

APPENDIX L (Continued)

EXPENSES	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	SUMMARY
<b>Administration at Cornell</b>											
Office of Director .....	5,653.96	8,423.27	17,995.43	22,958.96	23,250.37	22,827.15	23,286.05	19,711.61	10,387.25	3,573.51	158,067.56
Administrative Travel .....	897.28	6,175.81	3,194.83	10,083.31	10,293.87	6,869.27	5,202.51	116.04	3,767.57	—	46,600.49
Indirect Costs .....	14,510.45	50,520.15	37,287.87	30,000.00	30,000.00	30,000.00	30,000.00	25,000.00	15,771.10	4,228.90	267,318.47
Subtotal .....	21,061.69	65,119.23	58,478.13	63,042.27	63,544.24	59,696.42	58,488.56	44,827.65	29,925.92	7,802.41	471,986.52
<b>Cornell Staff in Philippines</b>											
Visiting Professors .....	50,550.88	140,280.96	185,577.98	205,643.35	233,961.53	224,399.88	200,930.27	162,584.16	121,325.33	7,077.67	1,530,332.01
Part Time Professors .....	26,386.95	15,817.04	32,324.20	53,534.14	39,767.42	84,872.06	21,180.80	16,516.83	4,976.22	—	295,375.66
Graduate Assistants .....	9,740.07	23,475.31	49,580.67	34,950.21	38,773.48	54,839.06	56,606.67	46,597.90	23,048.95	3,962.87	341,575.19
Project Expenses <sup>1</sup> .....	96,705.05	29,260.42	56,199.11	42,659.46	56,754.73	51,058.69	15,781.62	32,849.18	7,720.23	11,049.19	400,037.68
Subtotal .....	183,382.95	208,833.73	323,681.96	334,787.16	369,257.16	415,169.69	294,499.36	258,548.07	157,070.73	22,089.73	2,567,320.54
<b>Filipino Staff at Cornell</b>											
Visiting Professors .....	—	3,899.35	17,265.06	28,044.17	16,904.51	5,057.54	—	—	—	—	71,170.63
Graduate Assistants .....	4,428.18	21,117.02	43,688.31	72,503.07	89,042.39	58,821.78	92,774.09	36,381.62	11,016.74	13,357.35	443,130.55
Subtotal .....	4,428.18	25,016.37	60,953.37	100,547.24	105,946.90	63,879.32	92,774.09	36,381.62	11,016.74	13,357.35	514,301.18
<b>TOTAL EXPENSES .....</b>	<b>208,872.82</b>	<b>298,969.33</b>	<b>443,113.46</b>	<b>498,376.67</b>	<b>538,748.30</b>	<b>538,745.43</b>	<b>445,762.01</b>	<b>339,757.34</b>	<b>198,013.39</b>	<b>43,249.49</b>	<b>3,553,608.24</b>
<b>UNEXPENDED BALANCE,</b>											
JUNE 30 .....	276,127.18	419,957.85	190,344.39	66,967.72	43,624.58	62,781.22	45,961.98	14,704.64	26,472.53	15,470.76	15,470.76

<sup>1</sup>Transfer from Cornell income paid for partial salary of administrative staff membe.

<sup>2</sup>Receipts from sales of furniture and automobiles.

<sup>3</sup>Not summary of annual figures in row.

<sup>4</sup>Includes automobiles, furniture for UPCO housing and project leader's expenses.



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The campus plan that had been prepared earlier was closely scrutinized and many modifications were made. Space analyses and detailed floor plans were made by staff committees for each of the buildings and lists of equipment for each room in each building and estimates of costs were prepared. These plans and estimates were presented to representatives of the World Bank in the spring of 1964.

All of these things required long hours of hard work from many members of the staff, especially the chairman of the Technical Committee, Dr. F. A. Bernardo. The Los Baños staff did a really remarkable job in developing the schematics for the buildings and the lists of equipment. Contracts for the services of architects were signed in November, 1964. Highest priorities were given to construction of major buildings for biological sciences and for physical sciences.

There were many problems to be dealt with, such as determination of student loads and improvement of room layouts, that involved much time with the architects. The first sets of preliminary drawings for the biological and physical sciences buildings evoked a comment from the World Bank that "the design of the two science buildings does not give the impression that the designer thoroughly knows and understands what these buildings are called upon to do and what it requires in facilities, space, and equipment to do it."

When the bids started coming in late in 1966, they exceeded the estimated costs. The World Bank was concerned about the discrepancies between the estimated costs and the bids that were received. These discrepancies were due in part to a rise of about 30 per cent in construction costs since the estimates were prepared in 1963-1964. Another factor was the lack at that time of enough specific details from departments for the Technical Committee to estimate properly the costs of the many mechanical features that are essential parts of a science building. Thus, when the bids for construction were received, it was necessary to negotiate these with the successful bidders. By the elimination of elevators, central air-conditioning equipment, and other mechanical features and construction items, it was possible in some cases to reduce the costs below the initial bids.

To make room for Biological Sciences, the old building occupied by Agricultural Botany had to be demolished. Botany took up temporary quarters in Agricultural Engineering. Plant Breeding's building was torn down to make room for Physical Sciences and the Plant Breeding staff was crowded into Agronomy's facilities. The Plant Pathology building was demolished to make room for the construction of a new administration building and the staff took refuge in Animal Husbandry's facilities. These were just some of the disruptions that took place over a period of a few years, and it is amazing that any progress was made in teaching and research during this period of time.