FOREWORD

This report deals with the progress of the California Polytechnic School* during the calendar year, January 1, 1946 to December 31, 1946. However, for the benefit of those who read the report who may not be entirely familiar with the history and educational philosophy of this state college, certain sections have been included which do not deal exclusively with activities of the 1946 calendar year. It is hoped that the inclusion of a limited amount of background material relative to the college's unique educational philosophy and teaching techniques will make for a better understanding of activities which occurred during 1946.

This was the first year since 1943 that the major portion of the college's activities was not devoted to military training. But even though 11 of the 12 months included in the report were given over exclusively to peace-time pursuits, it wasn't until February of 1946 that the naval aviation training program was concluded.

Because of a greatly increased enrollment, which nearly doubled normal pre-war enrollment figures, and because of housing and expansion programs related to providing educational opportunities for veterans, the calendar year of 1946 was an important epoch in the educational progress of this state technical college of agriculture and industry.

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ANNUAL REPORT TO THE STATE BOARD OF EDUCATION
ON THE
PROGRESS OF THE CALIFORNIA POLYTECHNIC
SCHOOL

CONCLUSION OF WAR-TIME PROGRAMS

NAVAL AVIATION TRAINING

The first month of the calendar year of 1946 brought to a successful close the naval aviation training activities of the college which had begun three years before. During the period from January 6, 1943 to November, 1944, more than 3600 naval aviation cadets were trained at the California Polytechnic Naval Flight Preparatory School. A few months prior to the nation-wide discontinuance of this phase of naval aviation training, which was conducted in 17 colleges in the United States, the Navy selected the college as one of eight schools to continue a new naval aviation training program. This new program began in July, 1944, and until November of that year, both programs ran concurrently. This latter program, called a Naval Academic Refresher Unit, continued through February, 1946, with a total of 1100 trainees receiving instruction.

At the time the Naval Academic Refresher program was discontinued the Navy requested the school to continue with another navy training program, but the urgent need by returning ex-servicemen for housing accommodations made it necessary for the college to decline the invitation.

Despite the fact that the naval aviation training activities of the college during the three year period were conducted on an "all-out" basis, all regular activities of the college were maintained with

no cessation of educational service. The faculty was retained with little change, with most faculty members instructing both civilian and naval students.

FOOD PRODUCTION WAR TRAINING

Another war-time activity of California Polytechnic which was concluded during the calendar year of 1946 was that of the Food Production War Training program. This program closed officially on June 30, 1946 after three years of service in training given to more than 123,000 California farmers and members of farm families. California Polytechnic served as state headquarters and the president of the college was state director of this program. The program was financed by the federal government to provide training in methods of food production for farm workers, preservation and conservation of food for farm families, and related mechanical skills.

REGULAR PROGRAM

ENROLLMENT

Because of lack of facilities, dormitories, classrooms, laboratories, etc., it was necessary to limit the Fall quarter (1946) enrollment to 1809 students. This was more than double normal enrollment. Regular facilities of the college were not designed to care for more than 900 students, and even present emergency provisions for classrooms, laboratories, and housing are already over-taxed. Of this figure of 1809 students, 238 enrolled at the Voorhis branch, near San Dimas, and 1571 enrolled at the home campus, San Luis Obispo.

The number of regularly enrolled students at San Luis Obispo were divided fairly evenly between the agricultural division, with 792, and the industrial division with 779. Following is a breakdown of the San Luis Obispo enrollment by departments, by classes, by counties, etc. as of November 1, 1946:

Enrollment By Departments

Agricultural Division		Industrial Division	
General Agriculture	131*	General Engineering	65*
Agricultural Engineering	32	Architecture	41
Animal Husbandry	304	Aeronautics	154
Agricultural Inspection	26	Air Conditioning	186
General Crops	55	Electrical Engineering	160
Truck Crops	25	Electronics	84
Dairy Production	36	Mechanical Engineering	83
Dairy Manufacturing	34		779
Fruit Production	33		
Ornamental Horticulture	44		
Poultry	65		
	792		

* The majors of General Agriculture and General Engineering were added this year to take care of the overflow from specific departments where lack of facilities limited enrollment. At the end of the year, these students will be given a priority over new students in changing over to the major of their preference.

ENROLLMENT BY CLASSES AND CURRICULUM LEVEL (NOVEMBER, 1946)

AGRICULTURAL	VOCATIONAL	TECHNICAL	DEGREE	SPECIAL
Freshmen	95	58	348	43
Sophomores	9	8	81	4
Juniors	0	8	75	2
Seniors	0	0	57	4
	104	74	561	53

Total Agriculture 792

INDUSTRIAL	VOCATIONAL	TECHNICAL	DEGREE	SPECIAL
Freshmen	48	56	513	2
Sophomores	2	12	87	0
Juniors	0	0	33	0
Seniors	0	0	24	2
	50	68	657	4

Total Industrial 779

Grand Total 1571

Source of Financial Aid to Students*

G. I. Bill of Rights (Public Law 346) . . .	1130
Vocational Rehabilitation (Public Law 16). .	135
State Veterans Welfare Act	6
Earning way or private source	300
	1571

* Note: Due to the fact that the majority of the students enrolled in 1946 were receiving government financial aid in some form or another, and were generally eligible because of length of military service to at least four year's training, there was more enrollment in the degree curriculum than is normal. If these men were paying their own expenses, it is probable that many of them would have enrolled in the shorter vocational or technical course. In normal years the total enrollment is divided fairly evenly between the three levels of instruction.

COMPARATIVE SUMMARY OF REGISTRATION

County	Jan. 4, 1940	Jan. 1, 1941	Mar. 21, 1946	Nov. 1, 1946
Alameda	23	25	19	35
Alpine	0	0	0	0
Amador	2	1	0	0
Butte	6	9	1	1
Calaveras	0	1	0	0
Colusa	3	5	2	2
Contra Costa	15	17	7	13
Del Norte	0	0	0	0
Eldorado	0	0	0	0
Fresno	24	23	20	65
Glenn	6	7	1	3
Humboldt	7	13	6	12
Imperial	4	12	3	7
Inyo	2	2	0	2
Kern	17	18	8	29
Kings	6	13	6	18
Lake	3	0	0	1
Lassen	0	1	2	2
Los Angeles	185	197	163	397
Madera	6	5	1	3
Marin	3	1	2	3
Mariposa	0	1	0	0
Mendocino	5	8	1	9
Merced	15	16	2	13
Modoc	4	4	0	1
Mono	0	0	0	0
Monterey	6	8	8	19
Napa	0	1	7	4
Nevada	1	0	1	3
Orange	25	39	12	40
Placer	1	5	1	4
Plumas	0	0	0	0
Riverside	24	24	11	32
Sacramento	9	7	5	13
San Benito	0	3	1	5
San Bernardino	34	34	13	28
San Diego	24	20	15	69
San Francisco	14	17	19	34
San Joaquin	19	16	14	19
San Luis Obispo	84	81	134	175
San Mateo	2	7	6	22
Santa Barbara	25	37	19	32
Santa Clara	15	18	15	43
Santa Cruz	9	9	10	28
Shasta	0	1	3	1
Sierra	0	0	1	2
Siskiyou	4	7	0	4
Solano	2	5	0	1
Sonoma	10	9	8	19
Stanislaus	24	19	7	15
Sutter	1	4	0	2
Tehama	2	7	2	3
Trinity	1	1	0	0
Tuolumne	0	3	2	6

County	Jan. 4, 1940	Jan. 1, 1941	Mar. 21, 1946	Nov. 1, 1946
Tulare	15	21	18	43
Ventura	11	9	8	34
Yolo	4	3	3	2
Yuba	6	5	1	1
Other States & Foreign Countries	29	67	67	
Other States				179
Foreign Countries				20
	737	866	655	1518 *

* Only 1518 of 1571 students registered at the San Luis Obispo campus were included in this survey as some cards were not available at the time the study was made. Had the balance been included in this study, some additional counties would be represented.

VOORHIS UNIT ENROLLMENT
BY DEPARTMENTS AND COUNTIES

November 1, 1946

County	Ornamental Horticulture	Fruit Production	Agricultural Inspection	Total
Los Angeles	30	34	44	108
San Diego	7	8	4	19
Orange	5	9	6	20
Riverside	4	6	5	15
San Bernardino	1	6	7	14
Santa Barbara	1	1	2	4
Fresno	1		2	3
Sacramento	1			1
Ventura	2	9	5	16
Yolo			1	1
Kings			1	1
Kern			4	4
Sonoma			2	2
Napa			1	1
Santa Cruz			1	1
San Luis Obispo			2	2
Alameda			3	3
San Francisco		1	1	2
Imperial		2		2
Tehama		1		1
Tulare		1		1
Mendocino		1		1
Out of State	6	4	3	13
Out of Country		1	2	3
	58	84	96	238

A study of the foregoing summary of registration by counties at San Luis Obispo and San Dimas shows a percentage distribution of the counties having the largest representation as follows:

California Polytechnic - San Luis Obispo

Los Angeles	26.2%	Riverside	2.1%
San Luis Obispo	11.05%	Santa Barbara	2.1%
Out-of-state	11.8%	Kern	1.9%
San Diego	4.5%	Santa Cruz	1.8%
Fresno	4.3%	Foreign	1.3%
Tulare	2.8%		
Santa Clara	2.8%		
Ventura	2.2%		

Note: Remaining 33 counties which are represented in the enrollment study have less than 1% each of the total.

California Polytechnic - San Dimas

Los Angeles	45.4%	Kern	1.7%
Orange	8.4%	Fresno	1.3%
San Diego	8.0%	Alameda	1.3%
Ventura	6.7%	Out-of-country	1.3%
Riverside	6.3%	Sonoma	.8%
San Bernardino	5.9%	San Luis Obispo	.8%
Out-of-state	5.5%	San Francisco	.8%
Santa Barbara	1.7%	Imperial	.8%

The following eight counties have one-half of one percent: Sacramento, Yolo, Kings, Napa, Santa Cruz, Tehama, Tulare.

California Polytechnic stands out in contrast to the other state colleges in that its enrollment is wide-spread throughout the State, with 50 of the 58 counties represented in the survey made from only 1518 of the 1571 students enrolled on the San Luis Obispo campus.

Some directory cards were not filled in properly at the time of the survey, but had they been complete some additional counties would have been represented. A study of the home counties of matriculating freshmen at the University of California in Berkeley from 1935 to 1946 showed 61.6 percent came from the counties of Alameda, San Francisco and Contra Costa. At the University of California at Los Angeles, 91.78 percent of the freshmen enrolled are from Los Angeles County. At Fresno State College, 93.9 percent of the total enrollment for the Fall semester of 1938 came from the six counties of the San Joaquin Valley.

If most of the other state colleges are drawing their enrollment from the immediate vicinity of the schools, how does California Polytechnic account for this state-wide distribution? The most important reason is the fact that this college is the only one of its kind in the State offering vocational training on a college level. This college, with its training program built upon the student operation of productive projects, is filling a need and rendering a service which no other institution, because of its facilities, location, or educational concept, is able or willing to provide. Naturally the college's excellent placement record in agriculture and industry has become known throughout the State and this fact in itself attracts many students.

COURSES OF STUDY

VOCATIONAL OBJECTIVE

During the calendar year, 1946, the college offered instruction in eleven agricultural and seven industrial majors at the San Luis Obispo campus and three agricultural majors at the Voorhis branch. The majors of Electronics, Architecture, General Engineering,

General Agriculture, and Truck Crops were added to the offerings during the year. These new offerings were the result of considerable study on the part of the faculty committee for post-war expansion, and fit in well with the general pattern of vocational training on a college level.

The addition of such new courses must fit a measured demand for training in a particular field, and must also fall within the legal limitations established by the State legislature in 1901 in the act which founded the school.

> Education Code, Chapter 3, Section 20651 -- "The purpose of the school is to furnish to young people of both sexes mental and manual training in the arts and sciences, including agriculture, mechanics, engineering, business methods, domestic economy, and such other branches as will fit the students for the non-professional walks of life. This article shall be liberally construed, to the end that, the school may at all times contribute to the industrial welfare of the State."

The purpose of the school is clearly defined in the above act, and the final sentence gives basis for a broad interpretation. This objective of vocational training for specific occupations has remained unchanged since it was established 46 years ago. The fact that the college does not have women in attendance at the present time is the result of a legislative act in 1929 which prohibited them from attending. Although this law was repealed in 1933, the college can not accommodate women again until proper dormitory facilities are made available.

During the more than four decades of service to the State of California the school has raised the level of instruction and has expanded the number of occupations for which training has been provided, but the basic philosophy has not been modified in the slightest degree. The primary function of all instruction at California

Polytechnic is to impart to the students those skills and sciences necessary to successfully perform the vocational and technical practices for which they will be employed. Complementing the strictly occupational training are those subjects which help the student understand the world in which he lives, which assist him to express himself, to live harmoniously with other people, and to assume responsibility and community leadership.

The transition of the level of instruction from that of a vocational high school to that of a four year degree granting college was gradual. The school began in 1901 as a state vocational high school, and as such was considerably ahead of its time as far as the educational philosophy of that day was concerned. The idea of this type of vocational training gradually spread to the district high schools and ultimately became a part of the basic Federal and State programs of vocational education, beginning in 1917. Because the school had been established to provide education on a state-wide basis, and since no level of instruction was proposed in the legislative act which created the institution, it was found necessary and desirable in 1927 to raise the level of instruction to that of a junior college. This was done mainly because the concept of vocational training on a high school level had spread to the district high schools and many of them were by that time providing vocational instruction on a high school level.

In 1933, when the school was made a direct administrative branch of the State Department of Education and at the same time placed under the guidance of the Chief of the Bureau of Agricultural Education, it was changed from a junior college to a two-year and three-year technical college, offering terminal instruction in agriculture and

industrial fields. In 1936 a degree-transfer program was added, and in 1940 the State Board of Education authorized the school to grant the Bachelor of Science degree. That authorization made the school a full-fledged four year degree granting college and the first baccalaureate exercises were held in 1942. This authorization was based on an attorney general's opinion in the interpretation of Section 4, Chapter 101 of the 190 Statutes and later in Section 20655, of the 1945 Education Code which reads as follows:

> "The California Polytechnic School shall be governed by the laws governing and regulating the State colleges insofar as such laws are applicable to the school."

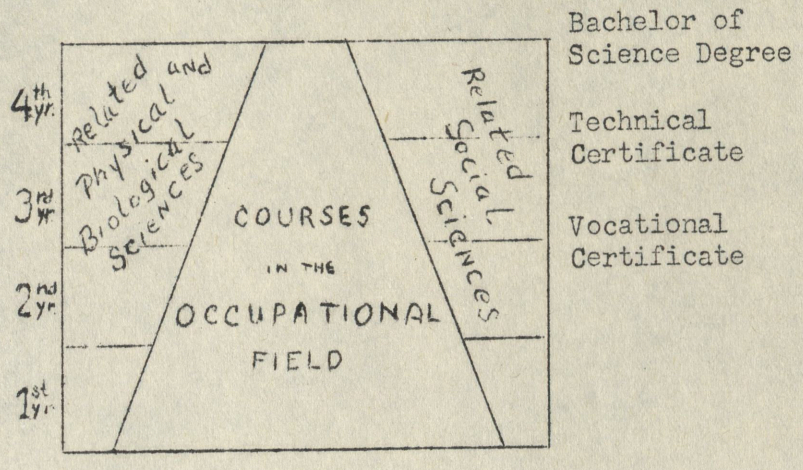
UPSIDE DOWN SYSTEM

One of the unusual aspects of the instruction at California Polytechnic is the educational plan which is followed to further carry out the objective of training for the maximum employability and earning power of every student. This unique educational plan which was established at California Polytechnic is sometimes described as the "upside down educational plan," but it has advantages over the conventional plan which is leading many educators throughout the country to agree that it really is the "right side up" plan. This plan is characterized by the grouping of as many technical and job-getting courses in the first two years as possible. In the third and fourth year the student takes, in addition to courses in his major, those subjects considered as "background." The net result of this system is that a student who completes the four-year course leading to a degree will have covered substantially the same program as would be covered in a similar major in a typical agricultural mechanics type college--but in an inverted order.

The student comes immediately into contact with the field of his major interest and choice and thus doesn't feel thwarted by numerous hurdles which at first seem to him unrelated to his interest. In addition he then realizes a need for some "theory" courses which are taken either concurrently or after his practice. A third important advantage, is that this system enables the student to earn a living, using the skills he has learned, at whatever point he may be forced to leave school because of finances, being needed at home, or other reasons. This educational pattern definitely improves the immediate earning capacity of those students, who, for various reasons, complete their formal education after one or two years of college, as so many of them in all colleges do. Naturally, if the student is able to complete the four-year course his opportunities for success in the more highly paid positions will be greatly increased.

As is indicated by the footnote relating to the enrollment chart on Page 4, the proportion of degree students to technical and vocational students in 1946 is not normal. Normally about two-thirds of the students have no intention of taking a degree course when they enter. Because of the "upside down" plan, it is possible to run the vocational and technical courses closely parallel with the degree program. This enables students who enter in the vocational or technical courses to change their program if they desire, and, without too much shifting of courses, complete a final year or two leading to a degree. The longer curricula vary principally from the two shorter programs in that a greater number of courses in social, biological and physical sciences are given, but actual occupational instruction is emphasized in all three levels.

Below is a diagram which shows how this plan works:



It should be noted in studying the chart that under the "upside-down" plan the emphasis during the first and second years of training is placed upon the courses in the occupational field of the student's interest. The related physical and biological sciences and related social science courses, which help one to know the "why," represent a relatively small portion of the total course content during the early years of the program, and become increasinly important as one nears the completion of his training period.

ADMISSION REQUIREMENTS

There has been no change in the admission requirements during the past year, except that a number of non-high school graduates were admitted under the State Board of Education ruling that any veteran of World War II, who served 90 days or more in the armed services, may enter as a regular student whether he has completed high school or not. With the exceptions of students who enter under this provision and under the provision for persons over 21 years of age as "special students," high school graduation is a prerequisite for admission to any of the three levels of instruction. Other requirements are that the student must submit evidence of fitness to profit by college instruction; such fitness to be shown by previous scholastic records, by evidence of good moral character and personal

qualifications, and by a satisfactory score on such aptitude tests as are given. It is the opinion of the administrators of the college that admission of a student, and his progress through the school, should be based upon demonstrated and continuing ability and interest, rather than the previous completion of a pattern of courses under a totally different environment.

CREDIT BY EXAMINATION

Of particular value to returning servicemen during the past year was the provision for receiving full credit for a course by challenge examination. Many of the ex-servicemen students had gained adequate knowledge of certain subjects required in their curricula through special military training programs or through experience. Because one of the objectives of California Polytechnic is to encourage maximum development, provisions are made to give full credit to any student who can prove by a written or oral examination or by a demonstration, that he has an adequate knowledge of all material which would be covered in the course which he wishes to challenge. This provision allows the student to extend his educational experience rather than to review what he has mastered already.

EXPANSION OF OFFERINGS

In 1946 California Polytechnic was accredited by the State Board of Education to give the Special Secondary Credential in Vocational Agriculture and the Special Secondary Limited Credential in Agriculture. This authorization followed passage of Senate Bill 788, which amended Sections 20451 and 20452 of the Education Code so that the state colleges could give courses "of such length as may be necessary to fulfill the requirements for the various credentials approved

for the teacher-training program of that college by the State Board of Education." Because of the four-year limitation prior to passage of this bill, an arrangement had been in force through which the University of California granted credit for work taken at California Polytechnic by agriculture teacher candidates. This arrangement had been in operation since 1931 with the Commission on Credentials, University of California, accepting the work done at California Polytechnic as meeting requirements for the special credentials in vocational agriculture. This arrangement was broadened about seven years ago and the credit for work taken at California Polytechnic has been used not only to meet the requirements for the credentials in agriculture, but also to satisfy most of the requirements for a general secondary credential.

When Senate Bill 788 became law, California Polytechnic expanded its services and is now offering not only the skills and methods courses for agriculture teacher candidates, but also the recommended work in general and professional education. This program was approved by the Accreditation Committee at its March 11, 1946 meeting. The cooperative arrangement with the University of California also is still in operation.

As a continuation to and an expansion of California Polytechnic's present program the college submitted on December, 1946 a 158 page report giving a complete picture on completed and contemplated educational expansion as the basis for an application to the Committee on Accreditation, State Board of Education, for the following:

Regular re-accreditation for:

The Special Secondary Credential in Vocational Agriculture
The Special Secondary Limited Credential in Agriculture

Original regular accreditation for:

The General Secondary Credential with majors in

Social Studies
Mathematics
Life Science and General Science
Physical Science and General Science
Agriculture
Physical Education

The Special Secondary in Physical Education

In complying with the recommendation made by the Committee on Accreditation (Appendix to Minutes, Feb. 28 to March 1, 1946) California Polytechnic established a Department of Education, and has employed Dr. Neil M. Daniels and Dr. F. C. Snow, both of whom have had appropriate training and experience in teacher education.

To complement the college's present services in the field of agriculture and industry, California Polytechnic has broadened its offerings in the Related Subjects Division with undergraduate work in progress and graduate work planned in mathematics, social science, life science, physical science, and physical education.

The vocational agricultural teacher training work which California Polytechnic has been giving and which has proved successful, as shown by the record of the teachers we have placed in the field, fits into the pattern of the general secondary credential. Agricultural and industrial curricula already provide for work which is more than the equivalent of the state minimum for a teaching minor in the science, mathematics and social science fields. However, to strengthen these offerings, the faculty was increased in 1946 by 56 new staff members, including ten with doctorates and all with appropriate experience, and the offerings expanded to the place where the college now can offer a B. S. degree with majors in Mathematics, Social Science, Life Science and Physical Science. In addition to these new degree majors the college is now adequately staffed to train applicants for

the Special Secondary in Physical Education and the General Secondary with teaching majors in Agriculture and Physical Education.

In establishing degree majors in the Related Subjects Division the college is strengthening and supplementing its work in engineering and agriculture with the same objective as it has always had--to place adequately trained men in agricultural and industrial production. The college is adding to this objective another--to place teachers adequately trained in selected and related fields in the secondary schools of California--teachers who not only know the theory, but who have seen it applied and who can challenge secondary school pupils with the value of the activities in which they are engaged.

Provisions were made during November, 1946, for training general secondary teacher candidates in critic schools located near the college. The college respectfully requested the Committee on Accreditation to pass favorably upon the application prior to June 1, 1947, so that summer school students could take advantage of present and proposed offerings in working toward additional credentials.

NEW CURRICULA

Beginning in 1946 three new degree majors were established and organization was completed for a fourth new degree major to be opened to enrollment in the Spring quarter.

Architectural Engineering

A four-year course leading to the B. S. degree in Architectural Engineering was opened to enrollment in September, 1946, and 27 students entered. The three-year technical and two-year vocational curricula in architecture were resumed after being discontinued during the war years.

Electronics and Radio

The new four-year course leading to the B. S. degree in Electronics Engineering was an outgrowth of the regular Electrical Engineering curricula. The Electrical Engineering department specializes in "power" while the new Electronics department deals with "communications" and its allied fields. The new department began in March, 1946, with 25 students enrolling in the degree course. By Fall of 1946 the department had 89 students majoring in Electronics.

Agricultural Engineering

The demand on the part of students for a four-year degree course in Agricultural Engineering was answered in the Fall, 1946, when the fourth year was added to the existing Agricultural Mechanics vocational and technical curricula. Thirty-two students are majoring in Agricultural Engineering, but in addition to that the department is acting as a service agency to all other agricultural departments with 611 students enrolled in required agricultural mechanics courses.

Printing

A four-year degree course in Printing, one of the few such degree courses in the United States, was established in 1946 with a full-time printing instructor employed in October, 1946. This course, which has received the whole-hearted endorsement and staunch backing of the California Newspaper Publisher's Association, will accept limited enrollment in the Spring quarter, 1947. The major task confronting the new instructor was overhauling the college's print shop equipment, re-equipping the shop, and moving it to its new location in the Publications Wing, Administration Building. Graduates of this course will have practical training in all fields of the printing trades, with related work in rural journalism, social sciences, physical

sciences, and other required subjects. California with its more than 300 small daily and weekly newspapers has many excellent opportunities for well-trained printer-journalists.

PROJECT OPERATION

Closely tied in with the college's objective of training students primarily for an occupation is the college's unique project system. This system consists of self-owned or managerial projects operated by students in such a way as to give knowledge in the commercial production and marketing of agricultural products or in the construction, rebuilding, repair, or maintenance of industrial machinery and equipment. This combination of the very practical "learn by doing" and "earn while you learn" philosophies not only enables a student to earn money while doing work directly related to his major academic interest, but also creates an added incentive for the more rapid acquisition of further skills and knowledge to the end that the projects will be more profitable.

In each major department students are encouraged by their instructors to take part in project activities, either individually or as a group. There is available a $90,000 revolving fund from which students may borrow to get the money for an investment in livestock, ornamental plants, seeds, feed, machinery to be rebuilt, etc. No co-signer is required for a student to borrow from the project fund, and the fund is so operated as to guarantee against individual student financial loss. Most popular agricultural projects are those of fattening livestock, raising foundation beef, sheep, swine or dairy cattle; conducting individual dairy projects or operating the project herd as a group; operating the poultry unit as a project or as individual projects; growing ornamentals or field and truck crops.

In the industrial departments the projects are usually group projects rather than individual projects. In aeronautics, for example, the department, which is the 84th government approved repair station in the United States and operates under strict C.A.A. regulations, accepts aircraft or engines damaged beyond feasible commercial repair to be overhauled for their owners or to be purchased out-right and rebuilt by students.

The project fund of $90,000 is not state money, but is a fund which grew out of a loan arrangement started in 1924 with the Citizen's State Bank which enabled students to borrow directly from the bank to finance their projects. Faculty members of the school stood behind this arrangement to protect the bank. From the very beginning of this project system, the school took a percentage of each student's net profit for the purpose of establishing a revolving fund. Because of the small enrollment in the early years of the project system, the revolving fund was too small to handle the financing of all projects. Up until 1932 students were still borrowing money through the bank to finance many of the projects. After 1933, the college's rapid growth was instrumental in building the fund up to its present size.

This fund is administered by a non-profit corporation known as the California Polytechnic School Foundation, the board of directors of which are all faculty members, which arrangement was made through the State Departments of Education and Finance. The Foundation is allowed to operate under lease with the State Department of Finance which limits the use of the corporation's funds. The accounts are audited by the Department of Finance and at the close of a fiscal year any cash or securities in excess of the given working capital, which has been set at $90,000 is sent to the General Fund of the

state. The project system of instruction is carried on at the Voorhis Unit of the college as well as at San Luis Obispo.

A limiting factor on the operation of the project system at the present time is lack of space for expansion, inadequate facilities, etc. For example, in the Animal Husbandry department lack of barn space and insufficient grazing land limit the number of animals which can be raised and thereby limits the number of students who can experience project operation. In 1946, only 130 of the 400 students in Animal Husbandry carried livestock projects because of lack of facilities. These students marketed 130 fed cattle, 500 fat hogs, 400 fed lambs at a total gross market value of $60,000.

Project operation in the other agricultural departments is on an equally large scale, but each is limited in expansion by lack of facilities. For more specific information on project activities during 1946 in each department consult the Departmental Reports in Section IV of this Annual Report.

STUDENT LABOR

In addition to the opportunities for students to earn money through managerial and self-owned projects, California Polytechnic uses a maximum number of students to operate the college farm and handle grounds and campus maintenance on the 2083 acres at San Luis Obispo and 150 acres at the Voorhis Unit. The college was forced to hire some full-time farm, janitor, gardener and dining hall help during the war-years, and the situation has not yet returned to the pre-war condition of competition between several students for every available job. Naturally, the fact that from 70 to 80 percent of the students are receiving government financial aid in some form or another, makes for less competition among students for the jobs.

In addition to absorbing a great amount of on-campus student labor, the college has an employment office where off-campus job opportunities are handled under direction of an instructor assigned part-time to that duty.

Following is a recapitulation of a typical month of on-campus student work as shown in the Foundation and State payroll reports for December 1946:

STUDENT LABOR - STATE PAYROLL
FOR MONTH OF DECEMBER, 1946

	San Luis Obispo			Voorhis		
San Luis Obispo	Number Employees*	Payroll	Total	Number Employees*	Voorhis Payroll	Total
Adm.	6	106.88		2	21.83	
	6		106.88	2		21.83
Instr.						
Ag	28	628.25				
Ind.	25	437.53				
R.S.	25	231.13				
Lib.	6	120.76		2	45.00	
P.M.	1	57.38				
	85		1475.05	2		45.00
M.O.						
Bldg.	27	581.51		11	196.50	
Grds.	13	243.30		13	135.15	
Autos	4	225.75		1	32.40	
Repairs	5	130.20				
	49		1180.76	25		364.05
Farm						
Gen.	4	153.00		1	19.20	
Crops.	5	42.23	Orch.	8	106.80	
Dairy	2	40.69				
M.A.	9	253.70				
Poultry	4	133.73				
	24		623.35	9		126.00
Totals	164		3386.04	38		556.88

* As the number of different employees suggests, every effort is made to employ many different students in order to provide experience to as large a percentage of the total enrollment as practicable.

STUDENT LABOR - FOUNDATION PAYROLL
FOR MONTH OF DECEMBER, 1946

Project Fund - San Luis Obispo	Number of Employees*	Payroll	Total
Dairy	37	758.52	
Beef	1	20.15	
Hogs	3	100.75	
Sheep	1	20.15	
Horses	1	21.45	
Poultry	12	324.62	
Crops	8	137.20	
Feed	4	43.50	
Total	67		1,426.34
Cafeteria Dormitory - San Luis Obispo			
Cafeteria	89	1333.10	
Dormitory	66	1011.31	
			2,344.41
Cafeteria Dormitory - San Dimas			
Cafeteria	17	208.70	
Dormitory	16	161.70	
			370.40
Administration Office Salaries San Luis Obispo	2	65.80	65.80
Veterans Housing	4	138.00	138.00
		Grand Total	4,344.94

* As the number of different employees suggests, every effort is made to employ many different students in order to provide experience to as large a percentage of the total enrollment as practicable.

GENERAL FARM OPERATION

During 1946 about 330 acres of state land and 83 acres of project-leased land was farmed and produced a good harvest of oats and vetch, alfalfa, small grains, and corn for ensilage.

Summary Crops Production - 1946

Acres	Land	Crops	Amount	Value
185	State	Oats & Vetch	420 Tons	$8,394.90
47.8	State	Alfalfa	117.7 Tons	$2,382.00
25	State	Small Grains	25.5 Tons	$1,081.00
23	State	Corn (ensilage)	200 Tons	$1,000.00
83	Project-leased	Hay	121 Tons	$2,420.00
48.3	State	Irrigated Pasture	48.3 Acres	$ 396.40

The Fall of 1946 was dry and the outlook for next year's crop is none too good. Lack of rainfall has emphasized the need for a study of water resources which the college is conducting. At present the committee is studying several possibilities: 1. Obtaining water from the Salinas River Reservoir 2. Building a dam on the college property to store flood waters on own land 3. Bringing water from nearby Laguna Lake 4. Further develop own wells 5. Purchase adjoining property on which a good irrigation well is located.

During the year the farm acquired a new International TD14, 60 horse-power, tractor; two Ford Ferguson tractors, used primarily in student truck crops projects; an All-Crop Harvester to harvest small crops.

The farm also acquired several additional plots of land: 14 acres of land adjacent to the dairy which had heretofore been leased, and 2 3/4 acres adjacent to the citrus grove.

The farm will receive considerable benefit from the new all-metal Farm Mechanics Building (120 x 180 foot with a 60 by 60 foot wing) which was begun in July, 1946 and will be finished around May, 1947. The building will be equipped for the maintenance, servicing, and repair of tractors and other farm machinery to be housed there.

There is need for additional farming land to produce the feed for livestock and give room for student crop projects.

Near the end of the year, the farm received a very valuable gift in the form of three registered purebred Suffolk draft mares donated by Norman McLeod, Pomona. Of the three new mares, one has foaled since it arrived on the campus and the other two are expected to foal soon. They replaced three old work horses.

SCHOLARSHIPS AND LOAN FUNDS

During 1946 two additions were made to the number of scholarships offered to students at California Polytechnic.

The Bank of America is offering one $200 agriculture scholarship to an outstanding Future Farmer to be awarded at a Marketing Day.

The San Francisco Downtown Optimists Club is offering one $50 agriculture scholarship to be awarded at the Junior Livestock Show, Cow Palace, San Francisco.

Other additions and changes made recently to scholarships offered include:

W. P. Rucklos established a new $100 annual scholarship award to a worthy aeronautical student who has completed the freshman year here.

The Rucklos Calcium Carbonate company established a new $100 annual scholarship award to a worthy animal or dairy husbandry student who has completed the freshman year here.

The Sears, Roebuck and Company is continuing to offer up to $2000 in freshman scholarships to worthy agricultural students wishing to attend California Polytechnic.

The South San Francisco and Stockton Union Stockyards Company has increased its award from one $100 annual scholarship to two $100 annual scholarships to be awarded to Future Farmers on the basis of excellence of performance in beef, sheep or hog project work.

The E. C. Loomis and Son Scholarship has been increased from one $50 annual award to one $100 annual award to an outstanding graduate of the high school vocational agriculture department at San Luis Obispo, Arroyo Grande, Santa Maria, or Cambria.

Philip R. Park, Incorporated, has increased their one annual $100 scholarship to two $100 annual awards to worthy boys who have completed two years of outstanding work at California Polytechnic in aninal husbandry, dairy or poultry production.

Other scholarships being continued are: the Safeway Stores, Inc., $100 annual scholarship; the Poultrymen's Cooperative Association of Southern California, $100 annual scholarship; the Washburn and Condon, $100 annual scholarship; the Challenge Creamery $100 annual scholarship; the Carl Raymond Gray, four $100 scholarships; and the Sears, Roebuck and Company, $200 sophomore scholarship.

LOAN FUNDS

The principal source of loans is the Leopold Edward Wrasse Loan Fund. This loan fund was established by a gift of $25,000 in bonds from an elderly Fresno County farmer in 1938 for the benefit of deserving boys desirous of an education and needing financial assistance. The bonds were sold by the school for $28,000. When Mr. Wrasse died February 1, 1945, at the age of 96, his will contained

a provision that the net income from approximately $400,000 of his estate would go to the college to augment this loan fund after certain other provisions of the will were fulfilled. Interesting aspect of this will was the fact that Mr. Wrasse, youngest of 17 named relatives who were last known to have been living in Germany, requested that any of these 17 relatives who were found to be living were to receive the interest from the estate until their death. At that time the college is to receive the entire amount. At present there is approximately $4,500 available for loans during the school year 1946-47.

Two other loan funds were established in the past year. The Veterans Loan Fund, a short time loan fund, was established by the California Polytechnic Women's Club for assistance of needy veteran-students.

The California Polytechnic Memorial Loan Fund was established from the contributions of numerous persons. It is designed to aid needy students where immediate financial assistance is needed.

Other loan funds available are: the Rotary Club fund, the California Polytechnic Women's Club Fund, The Student Accommodation Loan Fund and the Wilder Memorial Loan Fund.

STUDENT PERSONNEL SERVICES

Latest service to veteran students added in 1946 was that of a complete Veteran's Administration Guidance and Counseling service established in offices in the Administration Building on a contract basis between the Veteran's Administration and the college. This vocational guidance and counseling service for veterans began operation in December, 1946.

Since 1945 there has been a field representative contact office

of the Veteran's Administration on the campus, and since April, 1946 there has been a training office for counseling Public Law 16 veterans. The men in charge of both of these offices are former Polytechnic students who work in close cooperation with the College's Director of Testing and Guidance.

To further coordinate guidance service for the returning service men, the college has established the Committee on Veteran's Education which is composed of representatives from the Dean's office, the Registrar's office, the Recorder's office, personnel in charge of resident students, the Comptroller's office, Veteran's Administration personnel and the Director of Testing and Guidance.

Whether for the veteran or non-veteran the individual and group counseling plan tries to meet basic human problems. This plan includes a preliminary testing program for finding the student's educational needs; a course in Personal Development which includes such topics as how to study and take notes, how to read and study scientific material; how to maintain mental health; and how to develop personal, social and vocational proficiency. Individual conferences are held to aid the student to self-discovery and the best solution of his problem.

The college recognizes that men with varying academic backgrounds have difficulty in immediate adjustment to college courses. In order to keep men from dropping out for lack of some previous training or because the training was acquired sometime ago, the college has established "refresher" courses in English, mathematics and science. Credit in these courses may not be used for fulfilling degree requirements, but makes it possible for students to enter regular courses without handicap.

As an added service faculty members also conduct evening coaching sessions in a variety of subjects to aid students, principally veterans, who may find it very difficult to keep up with their regular assignments.

Guidance is not considered the province of a specialist alone at California Polytechnic. Department heads are expected to become well acquainted with the qualifications of their students, and in fact, are held largely responsible for the placement of their graduates.

STUDENT RECORDS

The college recognizes that sound personnel services depend upon adequate student records. Students are encouraged to go to the Director of Testing and Guidance or to the Recorder to examine their records to discuss past performance and future plans.

PLACEMENT

Because California Polytechnic emphasizes education for production, its students have little difficulty in finding employment through department heads and the office of placement, where representatives of industry and agriculture meet students and frequently offer them positions months before they have completed work for the degree. The record of placement of agriculture teacher candidates is 100% since only enough outstanding students are admitted to the teacher training program to fill the vacancies which will exist the following year.

THE LIBRARY

Great strides in the expansion and improvement of library service were made during 1946. A faculty committee survey of the organization and needs of the library was completed early in 1946 and

led directly to the appointment of three librarians holding professional degrees in library science and the employment of one full-time and two part-time clerical assistants. Funds were also made available for the appointment of another trained librarian and the position will be filled as soon as a suitable applicant can be found. Request for increased personnel has been made in the next biennium budget for the appointment of two trained librarians in 1947 and one trained librarian in 1948, and the employment of one clerical assistant in 1947.

During the year final plans were completed by the State Division of Architecture for a new library building to cost $400,000. This building will be the first permanent post-war building to be constructed on the campus. It will provide adequate housing for 130,000 volumes and a seating capacity of 528 persons.

At the beginning of the Fall quarter, the present library was enlarged by the addition of a new reserve book room adjacent to the present main reading room. Additional study hall space with a seating capacity of seventy was made available near one of the dormitories.

An additional result of the survey has been an increase in the appropriation for the purchase of books in order to meet the increased demands of the students and faculty upon the resources of the library. The original book budget for 1946-47 was $5,000; it was later increased by $2000 more. For 1947-48 $10,000 has been requested. This is exclusive of money to be spent for periodicals and operating expenses. The library now subscribes to 305 magazines and four daily papers, two weekly papers and the Sunday edition of the New York Times. Seventy-six periodicals were added to the subscription list in the Fall of 1946.

Other additions in 1946 were the purchase of the Education Index and the Industrial Arts Index services as an aid to patrons who desire to do research work. These are in addition to the Agricultural Index, the Reader's Guide to Periodical Literature, and the Educational Film Index to which the college has subscribed for many years.

In order to improve the service, re-cataloguing and re-labelling of the books began in the Fall of 1946.

A comparative study of accessions and expenditures for 1945-46 and 1946-47 follows:

	1945-46	1946-47
Total volumes added	645	1675
Expen. purchase library books	$1700	$7000
Expen. staff salaries	$1991	$9600
Expen. purchase periodicals	$ 400	$ 500
Expen. maintenance & operation	$ 640	$1200

FACULTY

The addition of fifty-six new staff members during the current school year, including ten with doctorates and all with appropriate experience were appointed prior to December 31, 1946. This brought the total teaching and administrative staff to 95 full-time persons and two part-time persons. The following chart indicates the amount of preparation as indicated by earned degrees and equivalent preparation:

	Full Time	Part Time	Total	Percent of Total Faculty
Doctor's Degree or Equivalent preparation	12		12	12
60 Semester Hours of Graduate Study, excluding those listed above	1		1	1
Master's Degree or Equivalent preparation	31	1	32	32
Bachelor's Degree or Equivalent Preparation	46	1	47	49
Less than Bachelor's degree	5		5	6
	95	2	97	100

FACILITIES

A number of new buildings have been added to existing facilities during the year 1946. Construction on four new buildings of a permanent nature was begun and is rapidly nearing completion:

1. Aero Hangar and Shop, 100 ft. x 120 ft.

2. One Agricultural Mechanics and Farm Machinery Building, 100 x 180 ft. with 60 x 60 ft. wing.

3. One Dairy Building including space for judging for dairy classes during bad weather.

4. Central Feed Processing and Storage Plant, 60 ft. x 60 ft., that will be used extensively by students in grinding, mixing, and preparing feeds for livestock projects on the campus. This feed mill includes 8 storage tanks, 21 ft. x 18 ft. x 6 ft.

In addition to the permanent buildings, forty 20 ft. x 48 ft. temporary buildings have been moved onto the campus for classroom and laboratory purposes. Twenty of these units are now being equipped for use as classrooms. The remaining units are distributed over the campus in connection with existing laboratories and will be used as laboratories and shops in the various departments.

An addition to the present Poultry Plant is nearing completion and will more than double the present facilities for instruction, particularly in killing, dressing and preparing birds for market.

A lack of adequate athletic facilities to take care of the physical education needs of an enrollment more than double normal is being rapidly remedied with the addition of a new $60,000 athletic field, which provides a new track, new practice football field, and a complete new baseball field.

The biennium budget for the coming two years as submitted, would make it possible to replace a great deal of the outmoded mechanical equipment, both in the shops and on the farm, and more than double the science laboratory equipment.

Listed below is a summary of the Buildings, Grounds and Equipment at the California Polytechnic in San Luis Obispo (does not include Voorhis Unit nor the college library):

BUILDINGS, GROUNDS AND EQUIPMENT
(except library unless specified)

1. Number of buildings used for educational purposes 23 ; for dormitory purposes 16 ; for other purposes 15 .

2. Number of regular classrooms available:
   Seating 1-15 4 ; 16-30 10 ; 31-45 12 ;
   45-60 23 ; 61 and over 2 ; Total 51 .

3. Types of special rooms available:

Type	Student Capacity	Special equipment and/or remarks as to use
Auditorium	450	Stage, piano-used for lectures
4 Ind.Demonstration Rooms	120	Demon.table,gas,water,and sink.
3 Ag.Demonstration Rooms	90	Special demonstration equipment.
Typing Room	15	Typewriters
Printing Room	15	Print.mach.,Linotype,press,etc.
Music Room	60	Recording Equip.Instru.music.uniform.
Projection Room	30	Projectors & black-out (piano stor./ blinds.

4. Laboratories and Shops.

Laboratory or shop	Student Capacity	Aver. annual expenditure past 5 yrs.	Amount budgeted this yr.	Present Value apparatus and equipment	Fee per student
9 Ag. Instr. Units	450	Do not keep expenditure records			Nil
4 Aeronautics Shops	100	or apparatus value by individual			"
Air Condition. Shop	30	rooms.			"
Sheet Metal Shop	20				"
2 Electrical Shops	55				"
2 Machine Shops	75				"
3 Ag. Mechanic Shops	75				"
4 Drafting Labs.	110				"
Power Plant	20				"
Machine Shop	25				"
Welding Shop	40				"
2 Chemistry Labs.	50				"
2 Physics Labs	60				"
2 Bio-Science Labs.	50				"

5. Value of property owned by institution.

Grounds (assessed value)	$ 182,676.75
Buildings (assessed value)	3,100,223.81
Furniture-including apparatus	555,426.57
Library (books only)	25,655.23
Other property-included in Furniture & Apparatus	
Total Property	$ 3,863,982.36

LANDS OWNED BY THE COLLEGE

The lands of the California Polytechnic College total about 2,233 acres, of which 2,083 acres are embraced in the home unit at San Luis Obispo and 150 acres in the Voorhis unit at San Dimas. Because of the type of agricultural instruction given at both the home unit and the branch, the availability of good farm land is a major factor. Additions must be made soon because of increased enrollment, in order to give each student as much opportunity as possible for actual project operation. There are several hundred acres at San Luis Obispo suitable only for range purposes. Other land is devoted to hay, alfalfa and orchard. The major campus and land immediately surrounding the various buildings now require about 100 acres. Additional land must be obtained for truck crops especially. At San Dimas about 30 acres of the land utilized for citrus, avocados and small deciduous tract, are well adapted to these uses. Considerable of the land is not suitable for expansion. Additional adjacent farming land is needed particularly for student-owned project operations.

LONG-TIME BUILDING PROGRAM

In the report submitted by the director of finance to the legislature in January, 1946, the college had eleven construction projects listed in the first overall priority list, and sixteen projects listed in the second priority list for the State Department of Education. A sum of $1,796,267 will be set aside from Fair and Exposition funds if they are made available to cover the first eleven items. The second group of items on the priority list are covered by a sum of $4,511,800 provided this is made available from horse racing funds. Following is the list of projects:

In the first group of projects are the following:

Library and Classroom Building	$ 400,000
Water Tank and Distribution System	14,000
Central Feed Storage Unit	66,667
Utility Building & Distribution System	224,933
Poultry Instruction Plant	100,000
Replace Corral Fences	26,667
Athletic Field and Addition to Gymnasium	133,000
Aeronautics and Industrial Shop	352,000
Agricultural Mechanics Building	202,000
Corporation Yard and Garage	124,000
Science Unit No. 1	153,000
	$1,796,267

In the second group of projects are the following:

Farm Buildings, Propagation House, etc.	184,533	
Addition to Electric Laboratory	20,000	
Engineering Building	199,000	
Farm Buildings (Farm Implement Storage, Veterinary Hospital, Swine Isolation Unit, & Livestock Judging Pavilion)	175,000	
Food Processing Building	200,000	
Women's Dormitory	124,000	
Men's Gymnasium	134,000	
Cafeteria and Kitchen	116,000	
Infirmary	32,000	
Agricultural Classroom Unit	199,000	
Addition to Administration Building	100,000	
Permanent Roadways and Grounds Improvement	520,000	
Auditorium and Music Building	387,000	
Residences for Employees	67,000	
Extension to Beef Unit	31,000	
Extension of Utilities	227,000	
	$2,715,533	$4,511,800

HOUSING

Most serious problem confronting the college in 1946 was that of housing a record enrollment of students, and also of providing housing for new staff members, many of whom would not accept a position unless housing arrangements could be made. Because California Polytechnic's enrollment is 90 percent out-of-town students, housing is always an important problem. At the beginning of the 1946 Fall quarter, the college was forced, because of delays in receiving authorization to use Camp San Luis Obispo, to house 150 students

temporarily in the gymnasium, 135 in the farm machinery shop, 75 in the dormitory lounges. While waiting for a release on the Army Camp, permission to use the city's newly acquired USO Building was granted for 30 days, and 200 students were moved into the USO quarters. Accommodations were arranged for 300 students to be housed in the Guest houses and Bachelor Officer quarters at the Army Camp some five miles from the campus when clearance was finally granted.

Of the nearly 400 married students attending the college, 125 married veterans families are housed in the on-campus veterans' village consisting of 75 one and two-bedroom movable house units, and 50 trailer units. This housing for married students was arranged in November, 1945, with the National Housing Agency, and the college paid $43,195 to the firm of Close and Lewis for moving and installing the units on the campus early in 1946. They are now completely landscaped, have central wash rooms with electric washing machines, and all modern conveniences. A mobile food market, operated as a private business by two veteran students, serves the on-campus residents with a complete line of groceries, vegetables, meats, etc. Milk and poultry products, as well as fruit and truck crops, can be purchased by these families at the campus sales stores of these departments.

To help alleviate the housing shortage problem facing new instructors, the college brought in five four-apartment units in the Fall of 1946 to house 20 faculty families. These were installed and ready for occupancy in December, 1946.

A site had been cleared and all arrangements completed for bringing to the campus an additional 188 trailer units. When the federal government withdrew all financial support for such projects last

December 14, it was necessary for the college to temporarily postpone the installation of these units pending satisfactory financial arrangements.

DEPARTMENTAL REPORTS

AGRICULTURAL DIVISION

AGRICULTURAL ENGINEERING

At the opening of the Fall quarter, 1946, there were 611 students enrolled in agricultural mechanics classes, which are required of all agricultural students. In addition there were 32 students majoring in this department, in either the new four-year degree course, or the two or three year vocational and technical curriculum.

Three new men were added to the staff in 1946, making a total of four and one-half. In 1947 the department will need a total of nine men on the staff.

No new courses were added in 1946 but courses in Farm Carpentry, Farm Power, Irrigation, Farm Electricity, Farm Structures, which had not been given for several years because of the war-time decrease in enrollment, were re-established. Next year new courses such as engineering surveying will be added for the degree majors.

Two new shops, established in buildings built in 1940-41 for the National Youth Administration, were completely equipped. Numerous pieces of equipment such as additional hand tools, electric drills, etc. were added.

This department uses an average of eight part-time students on student labor to maintain and repair shop equipment, repair farm equipment, gates, feeders, etc.

The new Farm Mechanics and Farm Equipment building, to be

completed in May, 1947, will give additional facilities for classes in farm tractors, farm power, rural electrification. Students majoring in Agricultural Engineering will have additional opportunities to gain valuable experience in servicing and repairing farm machinery and tractors.

ANIMAL HUSBANDRY

At the beginning of the Fall quarter 304 students were majoring in the Animal Husbandry curriculum.

One and one-half additional instructors were added to the staff, making four and one-half faculty members teaching courses in beef, swine, sheep, and light horse production.

Fifteen students were employed by the department on a part-time basis taking care of the feeding, etc. of livestock and working in the feed warehouse and feed processing plant.

About 130 students carried livestock projects, marketing 130 fed cattle, 500 fat hogs and 400 fed lambs, marketed at a gross of about $60,000.

Students of this department who showed their project-owned livestock at the Grand National Livestock Show, Cow Palace, San Francisco, and the Great Western Livestock Show, Los Angeles, in the open fat classes only, not only received valuable experience, but took ribbons and prize money back to the campus with them for the following:

From the Grand National. Beef classes - reserve champion carload of Herefords, champion Shorthorn, reserve champion Hereford, second, third, fourth prize Hereford individuals, second and third group of three Herefords, first place 1000-1150 Shorthorn individual, first, second and third place 1150-1350 Shorthorn individual, first in group three Shorthorns, second and fourth Angus individuals,

second group of three. Hog classes - championship Berkshire barrow heavy weight class, champion Poland China in heavy weight class, first in Poland middle weight, first in Duroc middle weight, first pen of Durocs in middle weight class, second and third prize Poland individuals, second prize Duroc light weight pen. Sheep classes - reserve champion pen with cross-bred wether lambs, first place pen of three, second and third individual class, second place pen three Southdown lambs, fourth place individual Southdown lambs.

From the Great Western. Beef classes - reserve Grand Champion Angus steer, reserve champion Hereford, reserve grand champion carload fat steers, first, second, third and fourth places in Hereford individual classes, first prize Shorthorn in 875-1000 class, reserve champion Shorthorn, first prize Shorthorn in 1000-1150 class, second prize Shorthorn in 1150-1350 class. Hog classes - Grand Champion pen of fat barrows, champion fat barrow, reserve grand champion, champion pen of Berkshire barrows. Sheep classes - first and second place Hampshire pen of lambs, second place Southdown pen lambs, second place individual Southdown.

The net profit made on livestock projects during 1946 was distributed as follows:

Type of Livestock	Profit to Students	Share to Foundation
Beef	$10,316.94	$5,136.49
Hogs	2,006.86	909.31
Sheep	497.33	182.14
	$12,821.13	$6,227.94

Thoroughbred Breeding Program

A special program of this department is the Thoroughbred breeding program operated cooperatively with the California Breeders Association and the college for the purpose of providing training in

handling light horses. The program began in 1940 with an original gift to the college of six brood mares in foal to some of the outstanding Thoroughbred sires owned by California Breeders. Four additional mares have been given to the college, and *Zuncho, a Thoroughbred stallion imported from South America is standing at stud at the unit as a permanent loan from Walter T. Wells. During 1946 Wells also gave the college an outstanding mare, *Lampyris, imported from England originally by Marshall Fields. During the annual sales at Santa Anita the college sold three yearlings for a total of $3,300. Two were sired by*Zuncho and one by Count Atlas. Five additional off-spring were foaled during 1946 and will be sold at next year's sales.

One important addition to the school's facilities which will aid this department is the new Central Feed Processing and Storage unit which is now under construction.

AGRICULTURAL INSPECTION

A student majoring in this field is required to take the first two years of study at the Voorhis unit near San Dimas, which is the heart of the Los Angeles fruit and vegetable market area, second largest in the United States. In his last two years at the San Luis Obispo campus the student takes related work and required subjects to fulfill the requirements for the B. S. degree. Ninety-six majors in this curriculum were enrolled at Voorhis unit and 26 upper division students were enrolled at the San Luis Obispo campus during 1946. (See the Voorhis unit report for additional information.)

CROPS AND FRUIT PRODUCTION

This department, which has increased almost three times as

compared to pre-war enrollment, has been divided into three subdivisions, with an expert instructor in charge of each and all activities of the department under guidance of the same department head. The total 1946 enrollment of 113 was divided as follows: General Crops, 55; Truck Crops, 25; Fruit Production, 33. Three instructors were added to the department, giving it a total of four full-time instructors. New courses added in 1946 include pomology, bee keeping, deciduous fruit nursery. The work of this department was strengthened by the addition to the related science division staff of an outstanding soil technologist. The department uses the following land:

20 acres	fruit plantings, 130 varieties grown commercially in California.
9 acres	irrigated vegetable land, (available on State property)
7 acres	irrigated vegetable land, (rented land adjacent to campus)
120 acres	planted to oats and vetch, (rented as student project land)

All work in the truck crops and orchard program is carried on by students, with no full time laborers. This gives a large number of students practical training, and gives them part-time employment. Truck crops are for the most part handled entirely as student projects, with the produce marketed on a commercial basis. The department maintains a campus store operated by students to sell products of the orchard, vineyard and truck crop land. During the 1946 season a total of $3,639.39 was sold in fruit and $1,664.81 was sold in vegetables, mostly to faculty, married students and the college cafeterias.

DAIRY PRODUCTION AND MANUFACTURING

Enrollment in this department was divided almost equally between

the two divisions, with 36 students taking production curriculum and 34 students enrolled in manufacturing. Construction began on a new cow shelter and judging barn, 100 ft. x 40 ft., during the latter part of 1946 and was nearly completed by March, 1947. J. H. Sawyer, dairy farmer from Galt, donated an outstanding young Jersey bull and also an outstanding yearling Jersey heifer to the department during the year. Mr. Sawyer had paid $600 for the bull as a calf at the same auction sale that the bull's sire sold for $10,500 and his dam for $2,300. Mr. Sawyer also contributed to the student loan fund.

Thirty-five or 40 students supplemented their training by doing practical work on a part-time student labor basis in the college's dairy, earning an aggregate average monthly wage of $1,000. During the Foundation fund's last fiscal year, September 1, 1945 to August 30, 1946, the dairy made a net profit of over $8,000. An average of 71 college owned cows produced 700,000 pounds of milk containing 30,071 pounds of butter fat, or an average of 420 pounds of butter fat per cow per year. The national average is 160 pounds per cow per year. Over $13,000 worth of purebred stock was sold to Future Farmer and adult dairymen throughout the Western area.

In addition to the college owned cows, about 50 cows are owned by 15 students as their own projects. A typical month of production for student-owned project cows (March, 1946) shows: 18 cows in production, producing 18,330 pounds of milk containing 740 pounds of butterfat, or 40 pounds per cow per month. This would be about 400 pounds per year per cow, or nearly three times the national average. After all costs of feed, overhead, etc. are deducted, the profit from these student-owned cows is turned over to the student owners. A new cooler and compressor was added to the manufacturing equipment.

All milking, bottling, processing and distribution is done by student labor on an hourly basis. Manufacturing students conducted two student projects, providing chocolate milk and ice cream for campus consumption.

ORNAMENTAL HORTICULTURE

Forty-four students enrolled in this curriculum in the Fall of 1946, and one full-time instructor was added to teach the first year courses. Two 20 foot by 40 foot classroom units were constructed adjacent to the horticulture unit's glass house and green house, providing greater efficiency in the handling of instruction. Construction has begun on a new lath house to supplement the existing one which is too small to take care of the number of students now enrolled. Every student in this department takes part in some type of project activity such as raising and selling vegetable plants, bedding plants, pot plants, gallon can stock, lining out stock, or cut flowers and bulbs. The largest project in 1946 was operated jointly by four students and consisted of 32,000 gladiolus bulbs planted for bulb production and cut flowers. The project fund purchases for resale to students for project purposes, sprays, fertilizers, seeds, rooted plants, and rents land on each project. Students receive 66 2/3 of the net profit with 33 1/3 going into the project fund for the use of the Foundation and to insure against possible individual student loss caused by conditions beyond the control of the student. The students are their own salesmen, turning in sales tags on every item sold, with the money turned over to the project fund weekly. Students are reimbursed for their share monthly. Some students earn as much as $50 per month on their projects. Largest sales are to wholesale dealers throughout the county. One

class project during the year was the growing out of 60,000 tomato plants for a commercial grower.

In addition to project operation, almost all students in this department earn part-time student labor doing campus ground maintenance and gardening. The department is in charge of all ground maintenance and uses student labor almost exclusively.

POULTRY PRODUCTION

Sixty-five students were registered in this department for the Fall quarter, 1946, with the services of one-half time instructor being added. The production capacity of the department was increased by the addition of the following new equipment:

4 Sunshine Brooders with a capacity of 1000 chicks per brood, or an increase in brooding capacity of 6000 per year.
4 fattening crates for growing meat birds
8 small growing and laying houses to increase project program.
1 automatic egg grader and candler
1 battery brooder with a capacity of 1000 chicks

Construction was nearly completed by the end of the year on an addition to the Egg Processing and Sales Building. The new addition includes lavatories, showers, butchering room, wrapping and refrigeration facilities.

Increase in facilities enabled the department to increase the number of birds to about 3800 laying and breeding hens, or a 20 percent increase. A breeding flock of Barred Plymouth Rocks was added and a new breed of Turkeys, Beltsville White, was added.

Students are operating 80 projects consisting of either 150 laying or breeding hens each or 250 or more chicks each. The student operator of the project shares the net profit on the project with the project fund, with the average student earning $10 to $15 per month. About 25 to 30 students are paid by the hour for labor out of

Foundation funds for processing and selling of products. A few students also work on part-time labor for the State in maintenance and repair of equipment and grounds.

INDUSTRIAL DIVISION

ARCHITECTURAL ENGINEERING

A four-year degree course was added to the two-year vocational and three-year technical levels of this curriculum starting at the beginning of the Fall quarter, 1946. Forty-one students enrolled, and one instructor was added as a part-time architecture and part-time engineering instructor. During the laboratory classes (nine hours per week) the students develop complete working drawings of homes and dwelling units according to drafting room standards and local and state building codes. The student ultimately blueprints and binds his project to have it in useful form. In upper division work emphasis is placed on estimating construction costs.

AERONAUTICAL ENGINEERING

Three new instructors were added to this department, bringing the total staff members to five. Enrolled in September, 1946, were 154 students. Additions to equipment included the following:

FM2 Navy Fighter
P51 Navy Fighter
P59 Army Jet Trainer
10 Pratt & Whitney engines
5 Lycoming R680-13 engines
2 Franklin six cylinder opposed engines
3 Ranger six cylinder in-line inverted engines
4 Link Trainers (one a Navy donation, and three purchased on surplus)
1 Doall saw
Numerous--instruments and aircraft accessories

During the year the college's 3000 foot by 200 foot air strip was widened to about 300 feet, and 30,000 cubic yards of dirt was

moved at one end to provide a location for the new 120 x 100 foot hangar on which construction is nearly complete. A 20 x 48 foot utility building was also installed next to the new hangar. Three new all-metal buildings were constructed adjacent to the aeronautical engineering shops: one 20 x 98 foot building for paint and wing construction; one 20 x 48 foot storage building; one 20 x 68 foot building for engine overhaul, sand blasting and cadmium plating.

One Piper Cub was rebuilt and test flown and 10 other aircraft are in various stages of being rebuilt in the CAA licensed aircraft and engine repair station. All work is done by students as part of their laboratory work under strict supervision of licensed instructors.

Although not a part of the department's activities at present, a Flying Club was organized during the year for students and faculty members interested in promoting flying and in learning to fly. The club now has 50 members and two planes have been purchased. One has been assembled and is being flown and the other is in the process of being assembled.

AIR CONDITIONING

With the largest enrollment of any of the six industrial departments (186 as of September, 1946), the department has added one instructor in heating and ventilating, one instructor in heating, repair and maintenance, and one instructor in heating, ventilating and plumbing layout. Although the laboratory of this department has been recognized by authorities in the field as one of the best equipped college laboratories of its type in the United States, considerable extension was made to take care of the increased enrollment. The Air Conditioning laboratory was extended into the wing formerly the sheet metal shop, and a more extensive sheet metal shop has been set

up in one of the new 20 x 48 foot all-metal buildings constructed next to the permanent building. Two other 20 x 48 foot buildings were constructed as additions to the heating and ventilating laboratory and the drafting and engineering practice room.

California Polytechnic is the only school in the country giving a degree in the subject of air conditioning and refrigeration. The course is so unique that there are only two college text books now suitable for use in the course, and the experienced instructors are forced to write a complete text syllabus on every course.

Added to the equipment was a dozen refrigeration units comprising brine coolers, quick freezing box, cold storage box coolers, test equipment and about $2000 in test instruments.

Received by the department as a gift from Walter T. Wells was a three horsepower ammonia refrigerating unit.

Included as part of the practical training of students in this department is the repair and maintenance of all refrigerating equipment on the campus, including that used by two cafeterias, dairy, poultry, student store, etc. Students also assist in repair and maintenance of all heating and ventilating equipment in campus buildings.

ELECTRICAL ENGINEERING

This department remains as the "power" branch of the electrical department after the division into a separate course of all "communication" phases of the work. In the power division three additional instructors were added to take care of the enrollment of 160 students. During 1946 a great deal of additional equipment was ordered, but manufacturers have been unable to fill the orders as yet. One Direct Current Supply unit to be used for induction heating test and experiment work was purchased through War Assets Corp. An addition

of a 20 by 60 foot building supplemented the shop facilities.

An important part of the training of students in this department is the practical experience gained in doing maintenance, repair, wiring, and motor repair and rewinding work for other departments of the college. There are over 300 electric motors on the campus, and the repair and maintenance of this equipment is both practical training and a useful service to the college. Students doing such work in time other than regular laboratory periods are paid from student labor funds.

ELECTRONICS

This new division of the electrical department started with 25 students in March, 1946, and by September, 1946, had increased to 84. Two new instructors were added to the staff, making a total of three. The entire top floor of the Agricultural Education Building was turned over to this department, for laboratory and classroom facilities.

In addition to the original radio and electronics equipment transferred from the electrical engineering laboratory, considerable new and surplus equipment was obtained during the year. The laboratory benches were wired and power supplies installed on each to make available D.C. voltages varying from 0 to 500 volts at $\frac{1}{2}$ amperes. Included in new equipment was:

7 model 772 Weston Multometers
4 RCA vacuum tube multimeters
4 four tube checkers
12 D.C. Milliammeters
4 oscilloscopes
2 radio frequency generators
4 audio frequency generators
1 square wave generator
1 distortion analyzer
1 "Q" meter
numerous--inductance and capacitance bridges
numerous--frequency meters
several --Army and Navy transmitters and receivers
several --Army and Navy public address systems

A $100,000 radar unit, known as "No. 5" in the Pacific defense setup, was awarded to the college by the army in October, 1946. It was shipped early in 1947 from Fort MacArthur to San Luis Obispo for demonstration use in electrical engineering and electronics classes.

The following courses were added: Elementary Direct Current Theory and Laboratory, Advanced Alternating Current Theory and Laboratory, Electron Tubes and Laboratory.

The three-year technical course in Electronics and Radio is primarily designed to train radio servicemen, commercial radio telegraph and telephone operators, general commercial communication technicians with specific preparation for commercial licenses.

The four-year degree course in Electronics Engineering will fill a need no other college is meeting today.

Students are hired regularly on part-time student labor to construct laboratory equipment from small supplies, consisting of mounting meters in cabinets, replacing worn out or burned out parts in equipment, and in constructing equipment and tools which will be used as the department grows.

It is anticipated that this department will be able to handle 100 to 150 students by September, 1947, with additional equipment and instructors.

MECHANICAL ENGINEERING

Eighty-three students enrolled in this department in the Fall of 1946. Two mechanical engineering instructors and two drafting instructors were added to the staff. Enrollment in this department was limited because of lack of accommodations. The department will continue to be crowded until the new central heating and power distribution plant, with laboratory and classroom facilities for this

department, is constructed. Laboratory work is organized around the central heating plant power generating and utilities dispersing center, which uses internal combustion, steam engines and steam boilers. Included in new equipment received are the following:

2 Superior Diesel Engines connected to 100 kilowatt generators
1 Hesselman Oil Engine electric generating unit, 125 kilowatt output
1 International Diesel Engine electric generating unit, 20 kilowatt output
1 General Motors Diesel Engine generator unit, 300 kilowatt output
2 Superior Diesel Engine generator units, 264 kilowatt output each
1 Atlas Diesel Engine generator unit, 200 kilowatt output
2 Hudson gas engines out of landing craft, 50 horsepower each
1 Packard gas engine out of a PT boat, 1250 horsepower
1 General Motors marine diesel from landing craft, 225 horsepower
1 Hudson marine diesel from landing craft, 150 horsepower

All above items were donations from the Navy with the exception of the oil engine and the International which were purchased through War Assets Corporation. A number of pieces of laboratory test equipment was obtained. In keeping with the practical training philosophy, students are overhauling and installing the engines in the central heating plant.

Except for additional floor space for classrooms in the emergency steel units, the department has no new buildings. Due to building conditions, the new central utilities dispersing plant can not be built for sometime.

Mechanical Engineering students are hired on student labor to help operate the central heating plant. During the war operation of electrical generating equipment for instructional purposes was discontinued because of lack of students. These engines are being overhauled by the students and next year will again be in operation generating electrical power for the campus.

RELATED INDUSTRIAL SHOPS

WELDING

One instructor was added, and because of the use of welding in engineering design and construction a welding engineer was obtained for the position. There is a close tie-up between this course and mechanical engineering because welding is commonly used in fabrication of engineering structures. The rear of the welding shop is being converted into a construction materials testing laboratory with tension and compression equipment, hydraulic press, hardness testers, torsion tester, heat treatment furnaces, grinding and polishing machines and microscopes. An atomic hydrogen welding unit has been added to regular equipment and several more A. C. welding units have been added to be used in training agricultural mechanics students.

MACHINE SHOP

One instructor was added. No new equipment was added, but considerable is on order. All new equipment is to be installed in the new machine shop (formerly the NYA machine shop). The present shop has been in use more than 40 years, and much of the equipment is antiquated, although in good working condition. The new shop will accommodate 25 first year men and 15 second year men.

V O O R H I S U N I T, S A N D I M A S

ENROLLMENT

After having been closed for instruction for a three year period during the war, the Voorhis Unit, citriculture and horticulture branch, reopened September 11, 1946. Enrollment for the Fall quarter was 238 students, which was almost double that of normal enrollment prior to the war. Of the 238, 197 were veterans and the remaining 41 non-

veterans. Only 21 men withdrew at the end of the Fall quarter and December enrollment reached 250. There were approximately 150 men eligible for admission who applied but were not accepted because of limited facilities. Of the total students enrolled at the beginning of the Fall quarter, 192 single men were housed in the six dormitories on the campus, and 13 married students brought their own trailers into a park made available on the campus.

STAFF

Dean of the Voorhis unit, Harold O. Wilson, was an instructor at the California Polytechnic College from 1936 to 1940 and Regional Supervisor with the Bureau of Agricultural Education from 1940 to 1945. Nine instructors and a librarian were added to the staff in 1946. Two instructors each are assigned to citrus fruit production and agricultural inspection; one instructor each assigned to agricultural mechanics, general crops and deciduous fruits, publications and English, mathematics and music, farm accounting and farm management.

IMPROVEMENTS

During the summer 1946 $29,000 was spent in renovating the physical facilities, including grounds, repair and repainting of buildings, etc.

NEW EQUIPMENT

The following pieces of equipment were purchased: new D-2 Caterpillar with a Dyrr offset disk and a furrowing out tool; new Ford-Ferguson tractor with numerous attachments, including a two-way plow, scraper blade, cultivator, and rotary broom; new International 1½ ton truck with orchard bed; many hand tools.

HOUSING

Plans were made in 1946 to erect buildings to accommodate another 80 single men on the campus. A building approximately 8,000 square feet in size has been assigned to Voorhis unit from the Santa Ana Army Air Base through the Federal Works Administration program that will provide classroom space for another 150 persons. If facilities are sufficient to accommodate the students by next Fall, it is anticipated that 400 students will enroll at that time.

LANDS

The present campus covers 157 acres. Of this 25 acres are suitable for farming operations and 17 of that already in oranges, equally divided between Washington Navels and Valencias. Another three acres are planted to avocados of several varieties. Another $2\frac{1}{2}$ to three acres are in a variety of deciduous fruits and a few walnut trees. Only a few acres are available for truck crops.

EXPANSION

To meet the demand on the part of students, plans have been made to widen offerings in deciduous fruits and crops, and to add dairy, poultry and rabbit production to the offerings. To add these courses will necessitate additional land, buildings, and staff.

SPECIAL PROGRAMS

AGRICULTURAL TEACHER TRAINING

All vocational agricultural teacher candidates for California are selected by the State Bureau of Agricultural Education whose offices are located at California Polytechnic. California Polytechnic has been giving skills and methods courses for agriculture teacher

candidates since 1931. Credit is recorded by the University of California, under an arrangement approved by both the state and federal agencies concerned with vocational agricultural teacher training. Starting in September, 1946, California Polytechnic expanded its services and is now offering directly not only the skills and methods courses for agriculture teacher candidates, but also the recommended work in general and professional education. This program was approved by the Accreditation Committee at its March 11, 1946 meeting.

Twenty-five to 30 candidates are selected each year from applicants who are graduates of an agricultural college, with a B. S. degree in agriculture, and who meet all qualifications. Most of the trainees are either graduates of the University of California at Davis or California Polytechnic and are usually in contact with the teacher training staff during their senior year. All are weeded out except those with practical farming experience, good college records, and demonstrated abilities in leadership of farm youth.

Following the period of selection, the teacher candidates are enrolled for one year of training on the graduate level, with specific provisions and understanding that there will be a further evaluation and culling at the end of the first month, or any other time during the period when it appears the candidate would not make a good agriculture teacher.

This training period is divided roughly into two parts:

1. A period spent at California Polytechnic to add to technical proficiency and securing professional training through regular classes under the teacher training department.
2. A period spent in a selected "critic center" under the careful supervision of an especially-chosen, experienced, voca-

tional agriculture, critic teacher.

SERVICE AND EXTENSION

The college serves as headquarters for the State Bureau of Agricultural Education. From this point, the bureau directly supervises vocational agriculture throughout the state; and through the college provides foundation stock for boys, and teaching materials for 360 instructors in 196 high schools in California. This service program to high schools includes such activities as: the using of faculty members to visit schools to discuss with students, dairy, animal husbandry, crops, poultry, farm mechanics, and other agricultural problems; the writing of articles by Polytechnic instructors for agricultural magazines; the corresponding by the faculty to advise high school departments on the solution of problems; the judging of livestock, poultry, and other products at fairs; the furnishing of breeding stock and hatching eggs to improve the herds and flocks of Future Farmers throughout the state; the preparing of teaching aids, such as film strips, price charts, blueprints, photographs, and economic analyses; and the holding of annual conferences on the campus.

Through the president of the college, who is also the State Director of Vocational Education, the staff is kept constantly in touch with new developments in business education, trades and industries, distributive education, and home-making education.

DRUG AND OIL PLANT PROJECT

This program, which is under the direction of the college, has offices in Los Angeles with a project director and assistant. The program began in April, 1942, under an emergency grant from the Governor's Emergency Fund and later supplemented by a special

appropriation of $35,000 by the legislature. In March, 1946, the Governor signed a bill appropriating $110,000 to continue the research and demonstration work in medicinal drugs and oils for which this state is a potential production area.

During the Fall of 1946 the state leased 1000 acres south of the college on the Arroyo Grande Mesa, which had proved to be a congenial host for growing certain types of Eucalyptus trees which are there now. Negotiations during the year located a source of Eucalyptus seed of varieties which produce safrol and citral in Australia and the seed should be ready for planting early in 1947 in demonstration plots on the Arroyo Grande Mesa property.

It is planned to set out on this 1000 acres another 435,000 plants as young trees. The plants, either in seed beds, flats or in plant bands, are available in the project's nursery at Oceano, and in outside nurseries which are caring for them for this use. Late in 1946 300 acres were prepared for field plantings.

Trial plantings of lavender, pennyroyal, oregano, byssop and other plants have been made on 1000 acres of rented land in Mendocino County, near Willits. Transplanted from the U. S. Department of Agriculture station at Salinas to the Mendocino land were Ephedra plants, source of drug known as Ephedrine. The Mendocino land also contains a substantial amount of California Tan Bark Oak trees from which the project will make experimental extractions as an index to production of tannin from the 3,000,000 acres of these trees now growing in California.

The project has undertaken the promotion and supervision of domestic production in California of many crops primarily of medical or condiment nature, and in addition has encouraged the harvesting of native or cultivated plants in California which are sources of

essential oils.

CONCLUSION

California Polytechnic School, although established in 1901, is considered by its employees and its students as a new and growing institution with tremendous potentialities. With the proper leadership and interest, which has always been shown by members of the staff, a spirit prevails that is stimulating to the average student as well as to members of the faculty.

The college has sometimes been criticized for being too flexible, yet the characteristic of flexibility made it possible for the institution to carry on a successful program for the United States Navy where frequent change was the rule rather than the exception.

So long as a sound core of instruction is maintained and based on well defined objectives, it has been the experience of the administration of the college that students and staff alike appreciate an opportunity for the freedom of thought that characterizes the college.

The college that proposes to meet the changing needs of agriculture, industry and education must be in a position to accept continually the challenge of change and to develop its program accordingly.