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ANNUAL REPORT TO THE STATE BOARD OF EDUCATION

ON THE

PROGRESS OF THE CALIFORNIA POLYTECHNIC SCHOOL

SAN LUIS OBISPO, CALIFORNIA

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I N D E X

FOREWORD

This report of California Polytechnic School to the State Board of Education continues the policy established in 1933 of making a summary of the past year's activities and accomplishments. However, for the information of new members of the State Board of Education and others who read this report, who are not entirely familiar with the history and scope of this state college, the current report covers a considerably greater period than the calendar year, January 1, 1943 to December 31, 1943.

A report confined to the activities of California Polytechnic School during the war-year, 1943, would undoubtedly bring praise to this institution for its contributions to the war effort, but it would hardly afford a clear picture of this state technical college's normal activities during a pre-war and post-war period. With this in mind, the report has been divided into three sections headed: PRE-WAR ACTIVITIES, DURATION ACTIVITIES, and POST-WAR ACTIVITIES. In order to cover this greater time-period it has been necessary to greatly condense the statistical material which ordinarily appears in this institution's annual report. Those who are interested in more statistical information are invited to read the previous annual reports which are available to each Board member.

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SCHOOL

PRE--WAR ACTIVITIES

HISTORY

California Polytechnic School was established by an act of the State Legislature, March, 1901, which became effective January 1, 1902. The purpose of the school, as stated in the bill, was 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." It also was stated that "this act shall be liberally construed, to the end that the school established hereby may at all times contribute to the industrial welfare of the State of California."

Although no level of instruction was proposed in the legislative act which created the institution, it opened as a State vocational high school on October 1, 1903. When other State institutions similarly created, moved to higher educational levels; as college training became more general and was more frequently required as a prerequisite to employment, California Polytechnic School remained a vocational high school for about 25 years. In 1927 the course of study was extended to the junior college level.

The institution was the forerunner in California, however, of vocational education along agricultural and industrial lines, which 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.

In 1933, the institution was made a part of the State Bureau of Agricultural Education, by action of the State Board of Education. This bureau is the branch of the State Department of Education which administers the vocational program in the State's public schools, and the chief of this bureau was made ex-officio president of the college. He has been retained in this dual office since 1933. In 1936 the course of study was extended to three years of college work.

In 1938, a completely-equipped school and farm near San Dimas, admirably situated and adaptable for technical instruction in citriculture, deciduous fruit production, agricultural inspection, and landscape gardening was deeded to the California Polytechnic school by its owners, Charles B. Voorhis of Pasadena, and his son, Congressman Jerry Voorhis. This magnificent gift to practical education was immediately put to use as an integral part of the main institution, being operated as a plant industries department of the institution.

In 1940, the State Board of Education authorized the California Polytechnic School to increase its level of instruction to that of a four-year college and to grant the Bachelor of Science degree to students successfully completing the degree-curriculum. The first baccalaureate commencement exercises were held in 1942.

CURRICULA

EDUCATIONAL PLAN

The California Polytechnic educational plan is characterized by the grouping of technical and "job-getting" training courses in the first two years. In the third and fourth year the student takes, in

addition to courses in his major, those courses generally considered as "background." It is found that the student has more interest in the study of natural and social sciences, and even cultural arts, when he first has acquired a thorough foundation of practical knowledge and skills relating to his major interest.

Under this system, at whatever point a student leaves school, as many are always bound to do because of finances, marriage, need at home, offered a job or other cause, he has a maximum knowledge of skill which will enable him to earn a substantial living. Naturally, if he is able to complete the four year course and get his Bachelor of Science degree his opportunities for success will be greatly increased. This educational pattern definitely improves the immediate earning capacity of those students who complete their formal education after one or two years of college.

This plan makes it possible to run the two-year and three-year curricula which do not lead to a degree, closely parallel with the four-year program, and enables students who graduate with vocational or technical certificates to return to school and, without too much shifting of courses, complete the final year or two leading to a degree. This plan constitutes one of the most outstanding examples of real functional education at the college level to be found in the whole nation. It retains all the virtues of job-getting concreteness and combines with these the liberalizing advantages of social studies integrated about the social issues which cluster about the job.

COURSES OFFERED

Bachelor of Science degrees are offered in the following curricula: Meat Animal Production, Crops Production, Fruit Production, Ornamental Horticulture, Poultry Production, Dairy Production, Dairy

Manufacturing, Agricultural Inspection, Aeronautical Industries, Air Conditioning Industries, Electrical Industries, and Mechanical Industries.

All of the degree courses listed above, with the exceptions of Agricultural Inspection and Fruit Production, also are given as two-year vocational and three-year technical courses. Agricultural Inspection and Fruit Production, both given at the Voorhis unit, are given as technical as well as degree courses but no two-year vocational course is offered for either of them. In addition to the above listed courses, Agricultural Mechanics and Architectural Drawing, are given as vocational and technical courses but not as degree courses.

The degree courses both in agricultural and industrial fields require 200 quarter units of credit. The teachnical courses require 150 quarter units and the vocational courses require 100 quarter units.

ENROLLMENT

REGULAR STUDENTS

Full-time student enrollment reached a peak of 980 regular students in the school year 1940-41, but began a decrease the following year because of the National Selective Service Act, availability of good jobs in war plants, and the shortage of skilled farm workers. The decrease to 828 regular full-time students for the year 1941-42 followed closely the percentage of decrease noted in other colleges during that year. During 1942-43, the Selective Service act made further inroads into the student body, leaving a total of 587. When the Selective Service act was changed to include 18-year olds, it hit this school harder than co-educational institutions which still can rely on having some women students.

The increase in enrollment from 219 students in 1935 to 980 in 1941 was a normal increase and one which can be expected to continue after the

war. During the last few years of normal enrollment, the school has attracted students from an average of 50 of California's 58 counties, a half dozen other states and a number of foreign countries, indicating the college is of real state-wide scope.

PROJECT SYSTEM

One of the most outstanding features of the instructional methods used at California Polytechnic School, and one which has brought the school nation-wide recognition for this application of the "learn by doing" philosophy, is the project system. Self-owned projects are combined with managerial projects to give students a combination of manipulative skills and scientific background unequaled in any other public institution in the country.

Each student is expected to engage in some project of commercial caliber. Agriculture students raise and market meat animals, such as swine, sheep, and beef cattle. They conduct dairy and poultry enterprises, either with their own foundation stock, or by contracting for some of the school's project animals or birds. They raise various plant crops and ornamentals. The students in the industrial division have projects of similar commercial scope, such as rebuilding airplanes, constructing and operating air conditioning machinery, running the college power plant and keeping the many electrical motors in good condition.

This training method, which makes it possible for students to market many thousands of dollars' worth of agricultural and industrial products annually, is dependent on the availability of a project revolving loan fund. This fund, under careful management by department heads, has grown from a few thousand dollars, to its present size of over $72,000. (Project activities during the past year are listed under Department Reports, DURATION ACTIVITIES.)

STUDENT LABOR

In addition to the opportunities for students to earn money to assist them in meeting expenses through project activities which have just been mentioned, California Polytechnic School has established a policy of using a maximum number of students to operate the entire campus and farm of 1400 acres. The average earning is several times as great as the typical college where adults are employed full-time to do a large part of the kind of work done by students here. During normal years, California Polytechnic School employs no adult gardeners or janitors, no dining hall help except cooks, and only two farm foremen who instruct students in maintenance, repair, and farm operation work.

Not only does the school make every effort to place students in employment both on and off the campus, but it seeks to correlate this outside work with the student's major course of study. Students of electrical industries aid in operation of the power plant. Majors in the field of dairying feed and care for the school's dairy herd, milk the cows, and operate the milk plant. Landscaping students maintain and improve the lawns, trees, and shrubbery.

SCHOLARSHIPS AND LOAN FUNDS

SCHOLARSHIPS

A large number of scholarships have been provided by various agencies to assist worthy freshmen students to enroll at California Polytechnic School. The number and scope of these scholarship gifts, each offered after careful investigation of the educational facilities and opportunities at California Polytechnic, are believed significant of the high regard for this institution expressed in tangible form by various firms.

The major donor is Sears, Roebuck & Co., which each year makes available approximately $2500 for 20 state-wide freshmen student scholarships, two regional freshmen student scholarships and one sophomore scholarship.

Freshmen scholarships of $100 each are also offered by Safeway Stores, Consolidated Chemical Industries, Inc., South San Francisco Union Stockyards Company, California Cattlemen's Association, Poultrymen's Cooperative Association of Southern California, Washburn & Condon Live Stock Commission Company, and Challenge Creamery. Two $50 freshmen scholarships are offered by C. E. Loomis & Sons and the California Polytechnic Women's Club.

Advanced student scholarships of $100 each for use at California Polytechnic School only are offered by Philip R. Park, Incorporated, and the Van Camp Laboratories. Four additional scholarships of $100 each are open to Polytechnic students, or to boys entering other agricultural colleges. These are the Carl Raymond Gray scholarships offered by the Union Pacific System. Previous winners of Sears, Roebuck freshmen scholarships are also eligible to compete against similar winners of other agricultural colleges for a junior scholarship.

LOAN FUNDS

There are five Student Loan Funds to temporarily assist worthy students. Loans from these funds are made for varying periods of time, and are passed upon by a faculty committee.

Principal source of loans is the Leopold Edward Wrasse Loan Fund. Others are the Rotary Club Fund, The Women's Faculty Club Fund, Student Accommodation Loan Fund, and the Wilder Memorial Loan Fund.

AGRICULTURAL TEACHER TRAINING

CADET PROGRAM

Since 1931, California Polytechnic School has been a functional unit in the training of prospective vocational agricultural teachers, and of teachers in service.

A selected group of from 25 to 30 men are chosen each year from among the agricultural college graduates of California and other western states. They enter a year of training, part of which consists of supervised practice teaching in selected high schools known as "critic centers," and part of which consists of attending special classes at California Polytechnic School, in teaching methods and in actual agricultural practices. The "cadets" or trainees thus spend five months in adding to their agricultural techniques at this institution. Their work here is supervised by the assistant State teacher trainer, while California State Polytechnic faculty members teach courses in skills.

IN-SERVICE PROGRAM

The college is also the training certer for the aid of in-service teachers. During the summer months, various courses are given in agricultural management and farming skills, and in professional improvement. In addition, the annual conference of the teachers is held on the campus. Full credit is given toward credentials and for local professional standing, through Polytechnic School-Bureau of Agricultural Education summer work.

SERVICE AND EXTENSION

An integral part of the administration of the California Polytechnic School is the service program for the vocational agriculture system throughout the state. When in 1933 this school was made the responsibility of the same agency which is in charge of this high school agricultural work, namely the Bureau of Agricultural Education, it was officially designated as the service institution to aid the high school vocational agriculture program, in addition to its resident offerings.

In this function, the school serves as headquarters for the bureau. The president of the school is chief of the bureau, and some of the members

of the Bureau Staff maintain their offices at the college. From this point, they directly supervise vocational agriculture throughout the state, and provide project materials for boys and teaching materials for the 265 instructors in 196 schools.

Samples of how the various agricultural departments and faculty of the college assist with this program are listed below:

1. Use of faculty members to visit schools on dairy, meat animal, and poultry problems.

2. Writing of articles by Polytechnic instructors for the State Future Farmer magazine for information and improvement of agriculture in the state.

3. Correspondence by heads of departments to advise high schools on problems.

4. Judging of Future Farmer livestock, poultry, and other products at fairs.

5. Furnishing of breeding stock to improve the herds and flocks of the Future Farmers throughout the state.

6. Furnishing of baby chicks and hatching eggs to improve poultry throughout the state.

7. Preparation and distribution of teaching aids, such as film strips, charts, blue-prints, photographs, etc.

DURATION ACTIVITIES

Some of the activities of California Polytechnic School listed in this section began prior to the entry of the United States in the war, but since these activities were directly connected with emergency defence training rather than normal pre-war agricultural-industrial training, they are included here. Some of these "duration" training programs have been

discontinued; others are still in operation. It should be understood, that despite the use of California Polytechnic School facilities and staff to conduct these various "duration" activities, the regular educational courses of this institution have been continued in every case in which student interest has been indicated.

WAR PRODUCTION TRAINING

This State Technical college was one educational institution which needed no reorientation of its educational program in order to take over its share of National Defense and later, War Production Training. The college was equipped with the facilities and the educational pattern capable of training skilled workmen quickly.

National Defense Training classes at California Polytechnic started September 3, 1940, at the very inception of this program in the United States. Instruction was given in machine shop, welding, and aircraft sheet metal work. Some classes were run 24 hours a day, seven days a week.

One of the first institutions in the nation to be granted a National Youth Administration resident project, California Polytechnic School dedicated the first unit of this project in October 1940. Almost immediately 230 young men began training in welding, machine shop, and aircraft sheet metal. There were two classes in each of these subjects being conducted. At this time, the machine shop and welding shop were running 24 hours per day. Eight hours a day were devoted to the regular Polytechnic School students in these two shops while the evening and early morning shifts were devoted to defense training workers including NYA enrollees.

The NYA also built two shop buildings on land leased from the school and by the fall of 1941, NYA classes were being conducted in those shops as well as in regular Polytechnic shops.

In May, 1941, a course for radio technicians was added to the newly named War Production Training program. From this date until February, 1943, classes in aircraft sheet metal, welding, machine shop, and radio were conducted four hours a day, five days a week for the resident NYA project.

In March, 1942, classes were started to train individuals preparing themselves for civilian employment under Civil Service in United States air depots. These trainees, both men and women, were assigned to California Polytechnic for training in service work in the aircraft maintenance field. The classes included radio repair work, aircraft sheet metal work, aircraft maintenance work, aircraft engines, and aircraft electrician. The classes operated eight hours per day, six days a week and the course was twelve weeks in length.

In July, 1942, radio training classes for the U. S. Signal Corps were begun. These classes also operated eight hours a day, six days a week for a period of twelve weeks. They were discontinued in January, 1943, due to consolidating of the Signal Corps training program. The men taking these classes were employed by the Signal Corps as radio repairmen.

During the entire training program at the California Polytechnic School for the War Production Training classes, there were 3,490 men and women trained for employment. Many more than this number began classes and received partial training but did not complete the course and so were not considered as "trained for employment."

By February 19, 1943, all War Production Training classes at California Polytechnic School were discontinued due to lack of housing facilities brought about when the U. S. Navy selected this institution as a Naval Flight Preparatory School.

NAVAL FLIGHT PREPARATORY SCHOOL PROGRAM

In January, 1943, California Polytechnic School was chosen by the Navy as one of the 20 schools in the United States equipped with the necessary facilities and staff to begin immediate training of naval aviation cadets. On January 6, the first battalion of 200 cadets arrived and instruction for them began on January 11. An additional 200 cadets arrived each month until a complement of 600 cadets was reached. In the past year, eleven battalions of cadets totaling 2200 men have graduated from the three-months flight preparatory training program, which is the starting point in the longest, most thorough pilot training course in history.

Since the inception of the Navy's new flight preparatory program last January, some of the Naval Flight Preparatory Schools have been discontinued, and now California Polytechnic School is the only Naval Flight Preparatory School west of the Rocky Mountains.

With the arrival of the Twelfth Battalion on November 29, this school was designated as a "fleet school" with all cadets in that battalion and future battalions taken from the "fleet" and Marine Corps enlisted personnel. The battalion size has been increased to approximately 280 men, bringing the total of cadets "on board" at one time to about 840.

Just prior to the recent increase in cadet-enrollment, 37 instructors were teaching full-time in the Naval Flight Preparatory School program. Of these 37 instructors, 15 were on the California Polytechnic School regular teaching staff prior to the inception of the naval training program. At present, the instructional staff is being enlarged to 46 instructors to meet the needs created by the assignment of additional cadets.

In addition to the school's instructional staff, the Naval Flight Preparatory School has a staff of approximately 25 commissioned officers who handle training in physical education, military drill, ship and aircraft

recognition, and disciplinary and administrative details of the program.

The school provides instruction, classroom, housing and dining hall facilities, for which it is reimbursed by the Navy through a special California Polytechnic Foundation Fund set up for purpose of handling the financial matters of this program. All housing and messing is the school's responsibility.

FOOD PRODUCTION WAR TRAINING

California Polytechnic School serves as the state headquarters and offices for the Food Production War Training program. The FPWT program is a training program financed by federal funds to give farmers and members of farm families training in methods of food production training of farm workers in preservation and conservation of food and related mechanical skills. The president of California Polytechnic is state director of this program.

During the past year, over 62,000 rural persons were reached by these courses in California. Most classes were given in the evening as part of the regular evening school programs of rural high schools. Over 1,600 courses in approximately 200 high schools were given last year. The California Polytechnic has provided offices, warehouse space, and other facilities for the operation of this program.

DRUG AND OIL PLANT PROJECT

Since April, 1942, the California Polytechnic School has served as operating agency for the Drug and Oil Project for the state of California with funds provided first from the Governor's Emergency Fund and later by special appropriation of $35,000 by the last legislature.

Offices for this project were established in Los Angeles with a project director and assistant. These two individuals are spending full

time working with farmers and other interested groups in encouraging the domestic production in many new crops in California. It is believed that this state is a potential production area for numerous plants whose products are used extensively in this country, yet in the past have been imported, but due to the war, are not now available.

This Drug and Oil Plant Project has undertaken the promotion and supervision of domestic production in California of the following crops: sage, marjoram, summer savory, sweet basil, colchicum, caraway, corriander, thyme, belladonna, datura stramonium, digitalis or fox glove, blue poppy, aloe, and many similar crops primarily of a medical or condiment nature. In addition, encouragement has been given to harvesting native or cultivated plants in California. This list includes essential oils from eucalyptus, pepper, camphor, laurel and geranium; in addition, farmers have been encouraged in assisting in the harvest of cascara, sage, and digitalis.

REGULAR COLLEGE LEVEL PROGRAM

Although the majority of the regular California Polytechnic staff members are teaching in the Naval Flight Preparatory school program, and the bulk of the school's classroom, housing and dining facilities are being used in the Navy program, these changes were made gradually and caused no great inconvenience to the regular student body. With all the various "duration" programs which California Polytechnic School has had, the school's first concern has been for the education and welfare of the regularly enrolled agricultural and industrial students. The steadily declining enrollment of this group has, however, made it possible for these war training programs to be undertaken without infringing on the normal course of study of those students remaining. Because of the lowering of the draft age, the only regular enrollment available consists

of 4F and men under 18 years of age.

At present, the California Polytechnic instructional staff has on it the equivalent of seven and one-half instructors, figured on the basis of time devoted exclusively to instruction in regular agriculture and industrial subjects. In order to maintain and continue production of essential food on the extensive college farm of 1400 acres with all its herds of purebred beef cattle, swine, sheep, dairy cattle, and poultry as well its acreage of cultivated crops and bearing orchards, it has been necessary to allot time equivalent to that of four and one-half instructors to this essential work. Thus, 12 Polytechnic instructors have divided among them the actual work as well as responsibility for all regular instruction combined with food production, livestock care and campus maintenance.

AGRICULTURAL DIVISION

Meat Animals Department:

Each year students in this department have purchased and fed out approximately 150 beef cattle, 500 hogs, and 400 head of sheep. Most of these animals are handled on a commercial basis and sold on the open market. Some have been fitted for and exhibited at the major livestock shows in California and Polytechnic students have made outstanding showing in competition with the breeders from all the western states. During the past four years, California Polytechnic students have shown grand champion steers, hogs and lambs at the California State Fair, The Grand National at San Francisco, the Los Angeles County Fair, and the Great Western Livestock Show in competition with adult breeders.

Although enrollment in this department is small this year, most of the students are working with the school's livestock and farming program in addition to carrying their own projects and regular course of study. The aim of the department is to keep its breeding herds of cattle, sheep,

and hogs intact and have enough livestock to utilize all the feed and pasture produced on the school farm.

During the past year, the department has, through project operation, marketed 224 head of cattle for $28,341.97; 340 head of hogs for $8,421.52; 326 sheep and wool for $5,243.11. This is a total of $42,006.60 worth of meat animals purchased, fed out, and marketed through the project fund operation, exclusive of sales of state-owned animals which are abated to the state. Many head of breeding animals are sold to Future Farmer boys thoughout the state each year.

By continuing the production program, this department is using its facilities to produce needed food supplies and will be in a position to give students the practical type of agricultural training they will be demanding at the conclusion of the war.

Thoroughbred Breeding Project: Operating as a part of the Animal Husbandry department, the Thoroughbred Breeding Project has been functioning since December, 1940. The project gives animal husbandry students an opportunity to work with Thoroughbreds, study feeding methods, watch the progress of the foals and become generally acquainted with the skills and practices in Thoroughbred horse production.

This project is a cooperative program with the California Breeders' Association. Members of this association donated to the college six outstanding Thoroughbred mares in foal and have agreed to keep these mares bred year after year to outstanding stallions. In turn, the college has become a centralizing agency for stud books and Thoroughbred horse information.

Foals produced in this program go into the annual sale sponsored by the breeders' association, and the proceeds are turned over to the college as abatement of expense for the care of the mares.

Dairy Production and Manufacturing:

The project program in this department has developed with the increasing enrollment which began in 1931 and continued until the outbreak of the war. During the year 1939-40, students of the department owned 75 head of dairy cattle which they had raised or purchased as part of their project activities. Several students have made over $1000 each on their dairy project while attending California Polytechnic.

The valuable purebred dairy herd is being kept intact and improved, and at the same time, is now producing 2000 pounds of milk daily with a gross income of over $2500 per month or $30,000 per year and with a fairly good net return. The net returns are used to help maintain the dairy unit and further improve the herd by obtaining higher quality foundation animals. Many valuable breeding animals are being supplied, particularly bulls, to Future Farmers and mature dairymen in California. An artificial insemination program is also carried on to breed cows owned by Future Farmers and adult dairymen.

In December 1943, cows in the milking string averaged 47.7 pounds of butter fat, and in most years the entire herd has averaged well over 400 pounds butter fat per cow per year.

Although it has been necessary to hire full-time workers to take care of some of the project work ordinarily done by students, the work is being continued so that the program will be in operation and ready for students to take over after the war. This department offers fine post-war opportunities in rehabilitation training, and by the maintenance of its excellent herd will be able to supply valuable seed stock for the re-stocking of domestic and foreign herds depleted during the war.

Poultry Production:

Last year this department produced 2500 individually pedigreed chicks. It is now trapnesting nearly 1000 pullets. It has about 2600

breeding hens producing eggs and chicks to supply the needs of former students and Future Farmers throughout the state. Last season over 150,000 chicks were supplied to the above outlets.

The student-owned project pens won the three-year award for the most outstanding performance at the California National Egg Laying test at Modesto. These student-owned birds averaged $3.94 net income per bird per year which was the highest for all breeds.

Last year, the trapnest pullets in the school project flock laid an average of 241 eggs per bird. This is an exceedingly high record for a flock of this size and demonstrates the breeding work being done by the student projects.

In addition to the student project activities, it has been necessary, because of decreased enrollment, to secure some adult help during the emergency to carry on the work necessary with the flock. Since eggs are an important war-time food, an effort has been made to maintain production. During the past year, more than 400,000 eggs were produced, a large part of which were used in the Navy mess hall on the campus. The total gross income for this department during the last fiscal year, ending June 30, 1943, was $33,200.

Crops Production:

Crop and fruit production, independent of student projects, has been carried on incidental to and as a part of instruction in this department. Although some of this instructionalwork must of necessity involve crops not ideally adapted for commercial production in this area, substantial returns have resulted. Last year's total sales of fruit amounted to $615.89. This is secondary to the use of the orchards and vineyards as laboratories for student practice in pruning, spraying, thinning, control of pests, and study of varieties. Total sale of vegetables last year were $509.16, and this too was secondary to the use of the land as a laboratory for truck

crop work, not only for students of this department, but for all agricultural students.

A typical student project in this department is similar to the project completed last spring by three students working cooperatively on rented land. These three students grew oats and vetch hay on about 58 acres. They harvested over 106 tons of excellent hay which they sold for $22.00 per ton baled in the field. Their cash income was $2424 of which $2338 was for hay and $86 for pasture. Their net, or labor income, after deducting all expenses was $1487. This project was carried on in a strictly business basis. The boys rented the property from the Union Oil Company, financed their own expenses, paid cash for rent of equipment, gasoline, seed, wire, and hired labor, and made all sales and other arrangements themselves. One of the three graduated in May, writing for his thesis, "Oats and Vetch, Its Production and Outlook in California," a subject closely correlated with his project activity.

Ornamental Horticulture:

Even with fewer students than usual, this department carried on more projects than ever. Eleven students of the department carried on two projects each, earning an average of $25 each. These projects consisted of growing annual vegetable and flowering plants, which were sold to the public by the dozen or by the hundred. One project of growing pot plants in the glass houses was successfully carried on. Local nurseries bought a large percentage of all plants for resale.

In line with actual practice in landscape gardening and design, students completely landscaped a private home as one project.

All maintenance of the grounds has always been part of the work of this department. It wasn't until July of 1943 that it became necessary to employ one full-time gardener and three part-time men, aside from regular

students. The department has planted less shrubbery, trees, and annuals than in previous years, due to manpower shortage. The following was planted by the department in 1943: 33,000 square feet of lawn, 4000 annual flowering plants, 70 small trees, and 550 shrubs.

Agricultural Mechanics:

Peak enrollment for this department was reached in 1940-41, with 17 students majoring in the field and 472 students from other departments enrolled in agricultural mechanics classes. During the fall quarter of 1943, 38 students were enrolled in agricultural mechanics classes with none majoring in that field.

Every student who majored in this field has had a job waiting for him at graduation and many more could have been placed. Many of the boys who graduated in this department have been steadily engaged in jobs vital to the war effort such as servicing and repairing tractors and farm machinery, carrying on large farming operations, and even designing and engineering new equipment for war use.

After the war, training in the mechanical phases of agriculture will be doubly important. Anyone who is not properly trained to service, operate, and keep in repair the many mechanical and motorized devices which will be the backbone of post-war agriculture cannot hope to compete with other farmers who have this training. Adequate training in every field of agriculture will require that more time be spent and more courses offered in the mechanical phases of that field.

With the whole farm as a laboratory and various equipment such as tractors, machinery, irrigation devices, livestock, dairy, and poultry equipment, fences and farm building to work with under actual farming conditions, the student has opportunities for learning-by-doing unparalleled anywhere.

General Farm:

Since the war, the school farm has continued, as in the past, to produce as much feed and pasture as possible. This is used primarily by the students in feeding out hogs, sheep, beef, and dairy cattle, and poultry in connection with their regular instruction and class work in the particular field in which they are majoring. Many kinds of fruits and vegetables are also raised on the farm by those students majoring in horticulture and truck crops. These are consumed for the most part in the school cafeteria.

Since the primary objective of operating the school farm is to provide a laboratory where as many students as possible may engage in the various farming practices and thereby learn how to perform each operation under actual farming conditions, all farming operations have been done entirely by the students in the past.

However, since the war, our enrollment has dropped so low that it has been necessary to hire two men to carry on that part of the farm work which cannot be done by students in order to maintain production. The few students who are here, however, have a greater opportunity to learn to do more different kinds of things because of the fact that there are fewer students among which to spread this work.

INDUSTRIAL DIVISION

Aeronautical Industries:

The Aeronautics Department is an approved repair station, under the rating of the U. S. Department of Commerce, CAA. The students receive credit for all time spent in class and laboratory work toward eligibility for an Airplane and Engine Mechanics license. The curricula of this department are so arranged that recommended students complete all Civil Aeronautics Administration requirements for eligibility for mechanics certificates.

No project production schedule has been followed during the past year but one airplane was completely overhauled and a second airplane was partially completed.

Other Industrial Departments:

Due to lack of enrollment, the activities of the Electrical Industries, Mechanical Industries, and Air Conditioning Industries departments have been curtailed or discontinued for the duration.

VOORHIS BRANCH, SAN DIMAS

The Voorhis branch of this institution also has discontinued instruction in the fields of Agricultural Inspection, Fruit Production, and Ornamental Horticulture for the duration because of lack of enrollment. Majors in these fields were able to transfer to San Luis Obispo to continue instruction in most phases of their work.

Since the acquisition of this branch in 1938, the production of citrus and sub-tropical fruit has increased 40% due to the maturing of trees and improvement of cultural practices in the school orchards. By the clearing of land and planting of additional trees, the acreage in production has been increased about 15%.

POST-WAR ACTIVITIES

Because California Polytechnic School's educational philosophy was so essentially related to this country's basic production needs in a peace-time world, it required no change in policy, training approach or methods to take over the many "duration activities" which have contributed to the war effort in various ways. Naturally, courses were streamlined, equipment added, and instruction intensified - but the fundamental principales are as sound for war-time as peace-time.

The conclusion of the war, again, will require no material change.

This institution is maintaining its facilities, has collected rather than lost members of its technically trained faculty, and is prepared to provide the type of education needed in the post-war world.

The world will always need its farmers and industrial technicians, its experts in the various public services for which training is provided. It is probable that the lessons of the war period - when millions of craftsmen had to be provided upon short notice - may center attention in the various states to the all-time need for protecting and encouraging vocational and technical education on all the necessary levels.

Educators throughout the country are aware that post-war readjustments will involve much occupational or vocational retraining for men and women demobilzed from military services and from war production industries. California's share in this problem will be greater perhaps than any other state.

The number of men and women who will seek training in California after the war will be large. It will include ex-servicemen in normal health whose expenses for further education would be paid by the government; veterans and civilians injured in war or in the defense industries and so needing rehabilitation and similarly supported; and self-supporting young men and women ready for normal post-high school education, some of whom will have had no employment experience and others who will have had employment in war industries.

This third group would probably be greatly increased in number because of the great growth in population which California seems destined to achieve - a growth which has been estimated to produce a population of from fifteen to twenty million within ten years after the war. Because of the great growth of industrial development apparently coming to the state, there might be a need not only for more industrial training, but also for

training in what might be called part-time farming. Many people may work part-time in industry and yet possess small farms of a few acres on which they would hope to make a living.

To provide the various types of training desired by these several groups, the California Polytechnic School need only add short-term courses, probably three months in length, to train men and women for immediate employment in agricultural and industrial work not requiring long periods of training; and courses of intermediate length (probably one year in length) for those ex-servicemen and women who will, apparently, be allotted one year of training at public expense. The addition of these shorter courses to the existing curricula would give California Polytechnic School a range of courses designed to fit a student for a definite type of employment at the end of three months, one-year, two-years, three-years, or four-years of training. The post-war program will be greatly expanded on all levels in such majors as Business Education, Hotel and Restaurant Management, Building Trades, etc.

CAPITAL IMPROVEMENT NEEDS

The capital improvement needs of California Polytechnic School as listed in this report are necessary either to take care of existing contingency or necessary to take care of expected post-war increased enrollment, or to replace facilities now existing but outmoded, insufficient or dangerous to student health and training.

1. Water Storage Tank and Extension of Water Distribution System - San Luis Obispo

The California Polytechnic School has its own water system, pumping water from wells. At the present time the water storage capacity is less than two days supply. This is decidedly an unsafe limit in case of trouble with pumps or with the distribution system. Likewise in case of a large fire the fire storage tank now in existence could be drained in a

relatively short period. This is a very unsatisfactory condition. Anticipated growth after the war, as well as present experience with the Naval Flight Preparatory School program which has now grown to more than 800 cadets, indicates that this is a most important need and, therefore, we have placed it at the top of the list. Within recent years, an improvement in the water distribution system was made by the installation of a new five-inch line, but an additional loop is required, which was not completed at the time of the improvement because of lack of funds. A new water storage tank and additions to the distribution system must be provided.

2. Utility, Building and Distribution Systems - San Luis Obispo

The utilities which serve the entire campus area should be centralized and located in a modern, fire-proof structure. The building from which our services are distributed now is very old, having been constructed about thirty-five years ago. For efficiency of distribution, for safety as required by state law, because of its use as a laboratory for training, and because proper utility distribution is a controlling element and is necessary for the future campus development, it is imperative that this improvement be made immediately after the close of the war. It is proposed, therefore, that the central heating plant, the central electrical distribution system, the gas distribution, and fire-fighting facilities be taken care of in a central structure.

A. Heating Facilities

The present old wood structure in which the boilers and electric generating equipment are located was constructed in 1908. The floors are oil-soaked because of the many years of use and constitute a constant serious fire hazard. The boilers were installed between 1908 and 1912, and although in use now, cannot be depended upon much longer.

B. Electricity

Of the several items under the general heading of improvement of electrical facilities, the following are most important:

(1) Installation of a new modern switchboard. The present switchboard does not meet safety law requirements and constitutes a constant hazard to students who use the facilities for instruction purposes and to those employed to operate the plant.

(2) Transformer vault. This was built many years ago and does not conform to state regulations; likewise it is a decided hazard from a safety point of view.

(3) Campus electrical distribution system. This should be put underground along with distribution systems of other utilities.

(4) Some buildings such as Deuel Dorm must be re-wired in order to carry the necessary lighting that modern standards require.

(5) Sufficient space must be provided for the installation of electrical power generation equipment to be used for educational purposes.

C. Gas

The central control system for gas is inadequate and is also housed in the present power plant building which is a definite fire hazard. A new control system of modern design is necessary and sufficient materials should be secured for proper handling of this utility.

D. Fire Fighting Facilities

A central location with adequate living quarters for attendants and proper servicing unit for fire fighting equipment is absolutely essential. It should be incorporated with or placed very near the central headquarters of other utilities.

3. Library and Classroom Building - San Luis Obispo

There is an imperative need for an adequate library at the San Luis Obispo campus. Originally it was contemplated that for an expenditure of $89,500.00 a separate library building could be constructed, but it appears now that it would be wiser because of the dire need for classroom space to combine with the library, additional classroom facilities that could at a later date be used as additional library space. Hence it is recommended that instead of constructing a library unit, exclusive of other facilities, that classrooms be combined with it in such a way that the entire structure can be later converted to library use as the growth of the college demands. We have never had other than make-shift library facilities at the California Polytechnic School and with the anticipated very great increase in enrollment after the war, the expansion of our offerings, and the granting of Bachelor of Science degree, it is now necessary that this inadequacy be corrected. Accrediting by some recognized accrediting association will have an important bearing on the future progress of the school and library facilities are one of the most important factors considered.

4. Two Dormitories (to house 100 each) - Voorhis Unit, San Dimas

Expansion of the Voorhis Unit of the California Polytechnic School is certain after the war. The location of the school in relation to the thickly populated center of California guarantees that there will be a decided need for expanding facilities at this unit. At the beginning of the war, the facilities were taxed to the limit, particularly with reference to domitory space and classroom space. Unless dormitory space can be provided for at least 200 men soon after the close of the war, progress of the school at this unit will be decidedly curtailed.

5. Classroom and Library - Voorhis Unit, San Dimas

Dormitories and classrooms are the most important limiting factors so far as expansion at Voorhis Unit of the California Polytechnic School is concerned. It is necessary that some correction be found for this limitation and a classroom building with adequate space devoted to a library in keeping with the educational objectives of the unit should be provided.

6. Aeronautics and Industrial Shop Buildings - San Luis Obispo

The present aeronautics and industrial shops are very old, are inadequate, and were not built for these purposes, therefore do not meet the needs. At the present time, many thousands of dollars' worth of excellent equipment for instruction in aeronautics, welding, sheet metal and machine shop work is housed in these old wood frame buildings. The possibility of fire which would result in destruction of this equipment is too important to over-look. This major has drawn large numbers of students. The expanding interest in the field will likewise bring large enrollment in the post-war period. The training which has been given has been successful, as measured by not only the placement of students, but their rapid progress once placed on the job. Therefore, it would not be in keeping with the importance of the work to fail to provide satisfactory facilities for these activities.

7. Agricultural Mechanics Shop - San Luis Obispo

This building will provide classrooms, lecture rooms, shops, and laboratories for instruction in agricultural mechanics as well as facilities for housing the power equipment used in connection with the farming operations at this institution. The present wood frame building is much too small and too crowded. A make-shift frame with sheet metal sides was provided several years ago as a stop-gap to relieve the over-crowding, but this is inadequate for satisfactory instruction. Because of the mechanical

aspects of modern farming, all students of agriculture are required to take considerable work in this field. This necessitates proper facilities which the school just does not have at present.

8. Agricultural Classroom and Laboratory Building - San Luis Obispo

At the present time, that instruction in agriculture involving need for classrooms and laboratory facilities is scattered throughout the buildings on the campus. Very poor laboratories particularly and almost to an equal extent limited classrooms available, makes this an important need which must be met. During good weather, a great deal of the instruction is done outside at the livestock units and on the farm, but in bad weather it is necessary that there be a place for housing this work in order for the instruction not be unduly crowded. For the last several years, the agricultural enrollment has constituted considerably more than half the total at the institution and provisions to take care of this and anticipated growth after the war must be made.

9. Auditorium and Assembly Hall - San Luis Obispo

At present we have no assembly hall large enough to house more than 500 students. To provide for assembling a student body of 1500 to 2500, which we anticipate, will require the construction of an auditorium and assembly hall. The present small auditorium in the air conditioning building will accommodate about 500. The institution outgrew this auditorium soon after the completion of the building. At this time an effort is being made to construct, with the help of the Navy, a large enough dining room in the proposed new Navy mess hall to accommodate somewhat more than this number, but to rely on this type of facility as a permanent place for assemblying students is not to be recommended. It could, at best, only serve for a year or two at the close of the war until something adequate could be provided.

Miscellaneous Items

While there are many more capital improvements that must be made at both San Luis Obispo and San Dimas, the following are a few of the small but more important ones that should be considered for immediate consturction after the war. Most of them are at San Luis Obispo.

10. Isolation Wards for Dairy Cattle and Swine - San Luis Obispo

The rather large number of livestock necessary for instruction at an institution of this kind must be properly cared for when infectious diseases strike. Isolation wards, while they are inexpensive, are fundamental and must be provided.

11. Infirmary - San Luis Obispo

Our experience over many years and more recently in connection with the Naval Flight Preparatory School program, has shown the importance of an adequate infirmary. Because our school population has always been largely housed on the campus, provisions for taking care of student health is a necessity. We have had stop-gap working arrangement with the County Hospital which has never been more than a minimum expediency but there have never been any facilities for taking care of emergency conditions which are apt to arise, nor has there been any quarters where a school nurse could live. Doctors have been secured under contract by the student body but no facilities other than a mere room without equipment has been available as a doctor's office. There are a number of possibilities that may develop after the war included in which would be a conversion of the present old dining hall into an infirmary, providing,of course, the new mess hall, to be jointly financed by the Navy and California Polytechnic, is actually constructed.

12. Water Storage Tank - Voorhis

At the present time the water at the Voorhis Unit is dependent upon the operation of three electric motors without adequate domestic water

storage as a part of this installation. With the construction of a storage tank with a capacity of perhaps 500,000 gallons, it would be possible to have not only a storage supply, which is almost imperative because of the possibilities of fire, but it would also be possible to supply the water needed at a much lower cost. It would be possible to pump the water with a smaller motor in place of the three now used, over a longer period of the day, instead of having to run these heavy motors which are necessary to maintain adequate pressure. A smaller pumping installation is a part of the system which would include a storage tank and pressure would be maintained by gravity from the storage tank.

13. Incinerator - San Luis Obispo

There is no incinerator unit in connection with this institution despite the constant health hazard to both students and livestock brought about because of no adequate place to dispose of refuse and diseased animals. An adequate incinerator must be provided and although the expense is small, it should be considered as an early item after the war.

14. Street Lighting - San Luis Obispo

At the present time there are no street lights on the campus which exposes students to unnecessary hazard. In an institution where the majority of the students live on the campus and hence have occasion to go to and from dormitories and study rooms at night, street lights should be provided. In connection with the extension of utilities which must be done in order to provide the framework on which the future progress of the institution may be made, street lighting should, and must be, included.

15. Central Feed Storage and Warehouse - San Luis Obispo

In order to purchase feed advantageously for the large amount of livestock at the institution, it is necessary that the purchases be made during that time of the year when prices are most reasonable. Likewise

to mix feed efficiently, it is necessary that a central building be provided where feed grinding and mixing can be done and it should be at the same place where the bulk of the feed storage is located. At the present time feed is stored at many out buildings throughout the farming area. The feed must be hauled to a central place for grinding and mixing and then taken out for feeding purposes in small quantitites as it is mixed because there is no place for storing mixed feeds. Adequate storage for livestock feeds produced on the school farm as well as those bought from the outside necessitates this addition.