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REPORT TO THE STATE BOARD OF EDUCATION

ON THE

PROGRESS OF THE CALIFORNIA POLYTECHNIC SCHOOL

SAN LUIS OBISPO, CALIFORNIA

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REPORT TO THE STATE BOARD OF EDUCATION ON THE PROGRESS OF THE CALIFORNIA POLYTECHNIC SCHOOL, SAN LUIS OBISPO, CALIFORNIA - JANUARY, 1935

I. HISTORY

Any report on the California Polytechnic School during the current period must take cognizance of the history of this institution. No school in the country had greater possibilities for real educational service during the last thirty years than did the California Polytechnic School. No institution has suffered more from warring political interests or adulteration of its original principles. Had not the school been founded on sound educational philosophy, it would have long since perished.

The California Polytechnic School was founded and opened in 1903 as the result of the efforts of a few far-sighted individuals who recognized that the future needs of California were for trained men who could work as well as think. The prosperity of the State then, as now, lay in its agriculture and industry. In these fields, there is a place for ten vocationally-trained persons to every one professionally trained, yet the Polytechnic School did not achieve the goal which is its natural heritage by virtue of the actual educational demand.

At the time the institution was established, there was little vocational work in the State, and its first years were strictly of high school level. Many of its graduates continued their education in institutions of higher learning to become agricultural and industrial experts. Many more went into the fields of agriculture and industry as farm owners and managers, plant foremen and skilled workers. The basic functions of the school were followed up to 1917, although the level of instruction was limited to high school age and the scope of training equally limited.

With the passage of the Smith-Hughes Act in 1917 and the gradual spread of vocational agricultural, trade and industrial and home economics training in the high schools, the California Polytechnic School entered a period in

which it groped for a place in the educational field. Following the war a group of ex-service men registered for vocational rehabilitation thus increasing the enrollment, but this apparently decreased the interest of the younger generation, for after the rehabilitation work was ended, the school dropped to a low attendance of 87 pupils.

At that time, the demand for vocationally-trained young men was constantly increasing. Complexities of farming and growth of industries were demanding continually greater training and more skills. In hundreds of communities, local vocational training was not yet established. At the same time, the age level for placement of graduates had advanced sufficiently to justify an increase in the educational level to a vocational level equal to the first two years of college.

Again the institution moved in the wrong direction. Under the continual pressure of the legislature, there was a constant quest for enrollment, and the school opened its doors to any boy over 14 years of age. Parents of unmanageable sons, juvenile courts and charity organizations seized upon the opportunity to place boys in this institution, located as it is in a small city, where the boys could be under close surveillance.

This was probably the most disastrous action which could have been taken. In the minds of educators, boys and parents, the school became an un-official reformatory. This circumstance still prevails so strongly in certain sections of the State today that it will be a matter of years before the California Polytechnic School is again accepted as a purely educational institution.

At the same time, a move was made in another direction which was equally fraught with danger. A purely academic junior college was established, with students accredited to continue their studies in the degree-granting institutions of the State. With no local junior college facilities, the opportunity to educate boys in a junior college at State expense was naturally seized upon by local individuals. Such a situation brought a recommendation

from an investigating body for the abolition of the School as performing largely the functions of a local junior college.

It was under these conditions that drastic and sweeping changes became imperative and were made. First was the abolition of the high school within the California Polytechnic School, which at that time was set up on the same curricula basis as any high school in the State. The work was placed on a vocational status, and while younger students were still admitted, a gradual change was made to encourage attendance of only those boys who had virtually completed their academic high school courses.

The second change was the abolition of the academic junior college, with the reorganization of studies to a vocational type on junior college level. With the farm and shop facilities available and the course offerings conflicting with no other vocational training in the State, the School once more was on its way to the fulfilment of its original functions. The level of instruction had been raised to keep ahead of the demand for graduates, as well as to be in advance of the spread of high school vocational training in the State.

II. THE BUDGET CUT

At the very time when the School was back to its definite and statutory place in the State's educational system, and when it was ready to advance and become of perpetual and valuable service to California, its previous weaknesses were brought to light. The problem type of student, the local junior college element and the failure of the School to fulfill its fundamental functions were emphasized. How far the School had strayed is shown by the fact that in a State with 40,000 boys between the ages of 14 and 20 living on farms, of whom about 70 per cent would go into actual farming, only eight boys were enrolled in the vocational agricultural courses at the California Polytechnic School. This was at a time when the Smith-Hughes vocational work was as yet not available to many thousands.

The fact that the School was fundamentally sound was the only reason

which prevented a worse cut than the 56 per cent reduction imposed. The drastic cut from $352,600.00 for the 1931-32 biennium to $150,000.00 for the current biennium resulted in the discharge of a considerable number of faculty members, office and farm employees. The remaining faculty members, with faith in the future of the School and a clear vision of its possibilities, added to their duties and expanded course offerings to take care of the increasing number of students.

This increase in student enrollment at a time when the depression was at its height, was one of the most encouraging factors. Enrollment at the California Polytechnic School has always been, and will probably always continue to be, from the agricultural communities and the smaller towns. At the very time when agricultural income was at its lowest ebb, interest in the school began to climb. Under the changes in administration and the improvement of the curricula, tremendous interest began to be evidenced, and it seems a very safe assumption that had farming income been at a higher level, the School would have been entirely unable to accommodate the students even on a highly selective basis of vocational ability and recommendation.

With the farming outlook definitely brighter than it has been for more than 10 years, there appears to be little doubt that the School will experience a 50 per cent increase next fall. Reports are being received daily indicating that in communities which had never before evidenced interest in the California Polytechnic School, from one to four students are definitely planning to enter the School either at the beginning of the spring semester, which opens January 7, or at the beginning of the fall semester of 1935.

At the close of registration for the fall semester of 1934, the School had enrolled 236 young men of an average age of 19 years, approximately 95 per cent of whom had completed high school before entering the Polytechnic School. These students come from 39 of the 58 California counties. Of the counties not represented, only five are in agricultural and industrial sections, the

remainder being the mountain counties of smaller population. The spread of interest is shown by the fact that Humboldt and Tehama counties in the north, and Imperial and San Diego counties in the south, have contributed a total of 22 students. The complete registration by counties is shown, with a total of 228 students enrolled from California. In addition, one student is enrolled from Mexico, one from China and the rest from other states.

County	Number of Students	
Alameda	3	
Butte	2	
Colusa	1	
Fresno	11	
Glenn	3	
Humboldt	4	
Imperial	4	
Inyo	1	
Kern	5	
Kings	1	
Lake	2	
Lassen	2	
Los Angeles	~~56~~	69
Mendocino	2	
Merced	4	
Modoc	2	
Monterey	~~1~~	2
Napa	2	
Orange	2	
Riverside	1	
Sacramento	2	
San Bernardino	~~8~~	9
San Diego	9	
San Francisco	~~2~~	3
San Joaquin	6	
San Luis Obispo	~~39~~	43
San Mateo	3	
Santa Barbara	~~6~~	7
Santa Clara	~~9~~	11
Santa Cruz	2	
Solano	3	
Sonoma	4	
Stanislaus	6	
Sutter	1	
Tehama	5	
Tulare	8	
Ventura	4	
Yolo	1	
Yuba	3	
	~~228~~	253
Other Countries and States	8	
TOTAL	~~236~~	261

Of this group, 123 students are enrolled in agricultural subjects and 113 in industrial subjects.

III. THE FACULTY

Vocational training is an intensive process of imparting the correct combination of skills, the knowledge of their application and the theory back of them. Such training requires a close personal relationship between instructor and student, and a painstaking supervision over the laboratory practices which at the California Polytechnic School are of a strictly commercial project type.

There is no individual harder to find than the teacher whose ability includes the correct balance of lecture and practice, of theory and demonstration, of student inspiration and commercial soundness. Again, tribute must be shown to the fundamental principles of the California Polytechnic School, for with the basic changes imposed to put the school back to its original principles, came a necessary change in the personnel. At that time a group of outstanding men were gradually added to replace those who had been the disciplinarians or the academic instructors of the past. That it was possible to get the highest type of men in the vocational field, even at a sacrifice in the salaries they were receiving in their previous positions, is ample proof of the fundamental soundness of the institution. These men were skilled in their profession and thoroughly cognizant of the needs of the agricultural and industrial fields.

With the curtailed budget, the teaching staff was loaded to the limit. At present, eight men are handling a total of 18 major fields and more than 40 specialized minor fields. The balance of the instruction in related subjects is handled by six full-time and part-time instructors.

IV. TYPE OF INSTRUCTION

No other institution in the United States carries out the vocational training on a grade level of the California Polytechnic School with as typical adherence to commercial practices. No other public school in the nation has

as adequate facilities for proper training in the fields covered by the curricula.

The instruction is typical of vocational philosophy--the classroom lecture and discussion established by actual application on a commercial scale. The typical student schedule consists of a four-hour morning program of classroom instruction in the major fields and related subjects, and physical education. The afternoon is spent in developing the skills through actual practice in the agricultural and industrial enterprises carried on.

The agricultural division maintains a 1400-acre diversified farm of which about 800 acres are range land and the balance under cultivation and in campus. The farm is stocked with beef and dairy cattle, sheep, swine and poultry, and with plots and facilities for orchard, landscaping and field and truck crops enterprises.

The meat animals in the foundation herds include 120 purebred Hereford and Shorthorn cattle, 60 purebred Hampshire, Shropshire and Southdown sheep, and 40 head of swine of Duroc-Jersey, Poland-China and Chester-White breeds. Several animals have been gifts to the School from noted breeders interested in perpetuating a fine line of breeding. Among them are the entire Poland-China sow herd of the famous Straloch farm three miles from Davis--one of the best-bred herds in the United States. Several high quality purebred animals have been given to the School at various times by such people as Will Rogers and William Randolph Hearst.

The dairy cattle in the foundation herds include approximately 80 head of purebred Guernseys, Jerseys and Holsteins. Although most of the stock is only two years of age, the School has a herd average of 410 pounds of butterfat per cow, a figure which will be considerably higher this year. The herd includes several State Fair champions and grand champions, as well as the outstanding holstein cow on the Coast.

The poultry flocks are the result of several years of careful breeding and selection for low mortality, high liveability and high quality of egg.

The system of management and pedigree selection on a commercial basis is looked upon by poultrymen throughout the State as the most advanced system yet devised for flock improvement.

The aeronautics department has the most completely-equipped shop for vocational instruction in airplane construction and repair, of any public school of similar instruction level in the United States. Floor space for as many as eight or ten planes, a complete series of engines for test and study, a welding plant for fuselage fabrication, stitchers for wing covering, and a painting department, are some of the features of this shop. A considerable amount of equipment has been donated by the Federal Government. The aeronautics department is licensed by the United States Department of Commerce as an approved repair station. All student work is accredited for Federal licenses and final examinations include passage of the United States Department of Commerce tests for airplane mechanics, engine mechanics and draftsmen.

The electrical industries department has a complete laboratory of switchboard and testing equipment, while most practical instruction in power transmission is obtained through operation of the lighting plant, which supplies all of the power and much of the heat for the campus. Diesel engine and steam plant operation are thus taught in a practical manner through actual use.

These herds, flocks, crop tracts and shop facilities are not for experimental purposes, but for fundamental management and practice by the students. With the exception of the work of two farm-hands employed in keeping up roads and fences and the heavy operations such as plowing and harvesting, every function in keeping up the farm and campus is performed by the students.

All instruction at the California Polytechnic School is of terminal character. The School is not preparatory for other institutions in any sense. The courses are designed to fit the graduate for ownership, or foremanship or managership, in the specified fields of agriculture and industry.

VI. PROJECT OPERATION

Project operation is an additional step in training in which the student has a financial investment as well as responsibility. It is in this field that the California Polytechnic School is unsurpassed in the Nation.

Here are some figures from the current fiscal year:

Meat Animals Department

14 Students raised and marketed 103 sheep valued at $800.60.
33 Students raised and marketed 516 swine valued at $6,377.98.
35 Students raised and marketed or kept for foundation animals 102 head of beef cattle valued at $7,357.91.

Dairy Department

8 Students raised 14 animals valued at $1,183.16. Some of these animals have been sold and others are being taken home for foundation animals in California's future dairy herds.

Poultry Department

20 Student projects in laying hens, brooding and incubating.
200,000 Commercial eggs produced by students in projects.
35,000 Hatching eggs produced by students in projects.
2,900 Chicks hatched, brooded and raised. Of these, 2,200 were individually-pedigreed.
2,000 Laying hens in projects, 600 in trap-nest projects.
4,000 Hatching eggs and 4,000 baby chicks provided for high school Smith-Hughes agriculture projects for the current year.

Horticulture Department

73,200 Flowering plants grown for campus landscaping.
9 Acres of field crops grown for meat animals consumption.
80 Acres of landscape on campus tended by students.
1 Acre of Young berries.
27,400 Plants and shrubs grown by students for sale.
8 Acres miscellaneous truck crops.

Aeronautics Department

7 Aeroplanes completely rebuilt or being overhauled by student labor. These planes are brought in, wrecked, by owners, repaired at cost of materials and returned to owners; or wrecked planes are purchased, rebuilt and sold. Value of work done, $2,000.00.

Electrical Industries Department

16 Campus wiring and electrical repair jobs completed. Total value of $500.00.
Operation of power plant at average value of $20.00 per week.

A revolving project fund supplies loans for the operations of the student. Every project carried through this fund is done under a written contract between the loan agency and the student. Interest is paid on the loan, as well as a share of the profits for the use of such equipment as corrals, barns, milking machines, etc. The meat animals students made a net profit of approximately $2,000.00 during the fiscal year. The dairy students made $577.34, and the poultry students $603.69. These figures are all in addition to the student payroll for labor in the care of non-project animals and birds.

The project fund was established through making a loan from local banks to finance student enterprises. The loans were later repaid as the project fund grew from sub-loans at interest to students and a share of the profits from its use. At the present time, the fund amounts to approximately $15,000.00.

The manner in which this fund performs a real educational service can be illustrated from a meat-animals project. A boy entering the California Polytechnic School fixes as his major interest the production of market swine. He borrows from the project fund for the purchase of feeder pigs, which may be bought from offspring of the School foundation herd, or from some outside source. Additional funds are loaned for the purchase of feed, vaccine if necessary, and finally for transportation to market. When the animals are sold, the fund is repaid the amount of the loan plus interest; and in addition, the fund receives one-third of the profit above expenses. This operation has given the student a financial responsibility, the necessity for close and frequent checking of expense records, and the opportunity to learn far more about the enterprise of raising market swine than would be possible in any other manner. While the example of pork production was chosen, the operation is similar in any other of the agricultural projects.

The project fund use for the industrial fields is done on a group basis rather than on individual loans, for the purchase of wrecked planes, repair supplies, or electrical equipment used in minor repairs.

The quality of the foundation and project stock is very high, teaching the students an appreciation of the best in the nation. The livestock shows and fairs in which Polytechnic animals are in the grand championship class is evidence of this quality.

VII. STUDENT LABOR

Approximately 85 per cent of the students are able to get some employment, either in their project operation, in addition to the project, or as a complete labor job. The foregoing is a typical month's student payroll, for the month of November, 1934:

Employed	Number	Earnings
Cafeteria	11	$236.83
Dairy	15	300.67
Grounds	11	207.83
Janitors	15	183.00
Meat Animals	3	62.00
Barns	5	73.00
Miscellaneous	17	217.00
Federal Funds	32	300.00
S.E.R.A. Funds	20	575.00
	119	$2,155.53

With the exception of cafeteria and janitor work, all of this labor is of a vocational nature, permitting the student to be earning while learning.

VIII. STUDENT PLACEMENT

In this field the record of the California Polytechnic School is decidedly optimistic. Virtually every recommended graduate has been placed in permanent employment, and the demand in certain fields has been greater than the supply. In total figures, there has been a demand for a greater number of recommended graduates than it was possible to fill. In the fields of poultry hatchery management, dairy manufacturing and aeronautics construction, employers have

been turned down for lack of available students.

On the theory that a school of this type has a responsibility for student placement where such is possible, the California Polytechnic has designated two men, one in agriculture and one in industry, as coordinators. These men have full-time duties already, but devote extra hours to contacting prospective employers. That the placement has been high straight through the depression, with employers hiring California Polytechnic School graduates even in the very face of letting off older employees, is ample proof of the substantial nature of the training.

Recommendation for placement is the goal of every student. Each class and course is set up with this objective. There is no set, academic period of training. The slower student may take longer to achieve his goal, but may get the same recommendation as the brighter student. No diploma is given, but a certificate of accomplishment setting forth the recommendation of the department head, is the statement received. This certificate is the best reference for employment or recommendation for success in the graduate's own enterprise, which can be given.

In addition to students who have gone into business for themselves, some of the recent graduates have been employed in creameries, poultry hatcheries and egg-production plants, city park systems, major livestock ranches, stock-yards, as feed salesmen, aeronautics construction plants, U. S. army air corps as mechanics, and various power and communications plants employing a knowledge of electricity.

IX. SERVICE TO THE STATE

In addition to the instructional work, the California Polytechnic School has been developed to a point of tremendous service to the State, particularly in the field of agricultural education in the secondary schools.

In addition to a full-time instructional load, every faculty member serves in an advisory capacity in his particular field to the 7,000 Smith-Hughes

agriculture students in 132 high schools of California.

An average of 30 to 40 letters per week are received by these men seeking latest information and assistance in the educational fields in which California Polytechnic men specialize. Each month, these men prepare a column of timely suggestions for the high school Smith-Hughes students, made available to the latter through the columns of the California Future Farmer magazine, subscribed for by every boy. There is a great demand for bulletins, the first of a series of which has been published and others under way but lacking time and funds for completion.

Another service field is that of radio instruction. This year, through the State Bureau of Agricultural Education, these instructors are carrying on a series of 32 agricultural lessons of 15 minutes each. The lessons are broadcast over a network of the three major National Broadcasting company stations in California and are being heard regularly by thousands of high school boys, in addition to hundreds of thousands of adult listeners.

Still another service is the supply of livestock and poultry for the improvement of quality in the State. Swine, sheep, beef and dairy cattle and poultry hatching eggs or baby chicks are in constant demand by the high school students and the graduates of the California Polytechnic School.

In addition to the services given to teachers and students by mail, radio and personal visits, the School furnishes facilities for the summer session and annual conference of the 219 agricultural teachers of the State, and for the annual convention of the Smith-Hughes vocational agriculture students who are members of the Future Farmers of America.

For the past year and a half the Chief of the Bureau of Agricultural Education, who is also State Adviser of the Future Farmers of California, has acted as Director of the California Polytechnic School and has his headquarters at that institution. It is through this arrangement that the School can render invaluable service to all of the agricultural teachers and vocational

agricultural students in California. All activities of this program are thus centralized.

Both locally and statewide in importance are the facilities for meetings of agricultural agencies. The California Dairy Council, beef cattle associations, swine allotment groups and the Horticultural Commissioners of the State are among the groups which have already used the facilities of the School or will do so within the next few months. A project fair and exhibit in the spring draw more than 2,000 persons from all over the State to improve their knowledge of the correct market types and practices.

X. PHYSICAL PROPERTIES AND IMPROVEMENTS

From the standpoint of taking care of the students, the California Polytechnic School is in excellent condition. Its needs are discussed later.

The School has four modern dormitories, well equipped, and an excellent dining hall. Adequate classroom facilities exist, and a new gymnasium and athletic field take care of the physical education work.

In spite of the curtailed budget, more improvements have been made on the campus through Federal Relief Funds, than for many years previous. Most important was the landscaping of the campus, putting in lawns around every dormitory and some of the other buildings, and planting shrubs and flowers. This has made a great improvement in the appearance of the campus.

In addition, more than a mile of road on the campus was rebuilt and all the roads given a new gravel surface. Concrete sidewalks have been laid, connecting the dormitories with the classroom buildings, and a concrete retaining wall has replaced an unsightly wall adjacent to the gymnasium. A dairy feed room, ten individual hog units, and a platform scale were built and installed. In addition, every campus building was given an exterior coat of paint. Federal funds furnished labor amounting to $25,391.00 and additional material of $2,893.00, while the School budget furnished materials from minor construction and other funds of $9,600.00.

XI. TEACHER TRAINING

For the last four years, the California Polytechnic School has been of invaluable service to the State for training agricultural teachers, both those who are seeking future employment, and those in service.

In contrast to the supply of teachers of general subjects, there is a serious shortage of high school vocational agriculture teachers. This is due to the high standards necessary for these men, and the rigid requirements set up in the selection of those with practical farm background, ability to handle and instruct boys, and the inspirational nature needed to develop rural leadership.

Under the present training plans for prospective teachers, a group of from eight to fourteen, selected following graduation from the University of California, College of Agriculture, or other approved college or university, are first placed in certain designated high schools for the fall semester. Here they teach part time under supervision of the teacher trainer of the Bureau of Agricultural Education, and the local high school agricultural department heads.

For the spring semester, these trainees, known as cadets, are placed at the California Polytechnic School. Here they continue part-time teaching under similar supervision, and in addition get practical experience with the herds, flocks and farm operations at the Polytechnic School. After four years of college, the practical work at the State school reestablishes valuable contact with the skills necessary to instruct in vocational agriculture. The cadet teachers also receive systematic instruction in teaching methods and procedure at the California Polytechnic School.

Teachers in service are also served by the school. During June or July each year, the annual summer session and teachers' conference are held on the

Polytechnic school campus. Members of the California Polytechnic School faculty and the State Bureau of Agricultural Education staff conduct intensive short courses in livestock and dairy management, poultry production and horticulture and agricultural mechanics work. The facilities possible for this training can only be found at the Polytechnic school, and the courses are attended by 75 to 90 per cent of the agriculture teachers in the state each summer period.

In addition, the high school agriculture teachers are in constant communication by mail and personal visitation through the school year.

XII. CHARACTER BUILDING

To assist the graduating student of the Polytechnic school to assume responsibility, the student body and the campus student organizations maintain control over the many functions of the school. Committees of students plan and recommend the conduct of the cooperatively-operated dining hall and the dormitories. Athletics and recreation are in the hands of student committees.

The campus clubs sponsor the annual school fair in the spring, the Homecoming event in the fall, and programs for many visiting groups.

The democratic nature of the Polytechnic School is another element in character-building. Virtually every student is in need of financial assistance to complete the school year. The "rich" boy with money for any luxury is practically unknown, and when such a student does register, the democratic character of the student body quickly brings him to the same responsible and self-reliant level as the rest of the students.

XIII. NEEDS

The needs of the California Polytechnic School may be divided into three fields: Financial needs, the need of a better understanding of its functions

and possibilities on the part of educators and legislators, and the need for a more thorough presentation of its educational facilities to prospective students.

Its financial needs are first to replenish the almost non-existent supply of materials for classroom instruction and laboratory purposes. Under the curtailed budget, virtually no funds remained for the purchase of such necessities. No new books could be provided, shop tools and materials, or laboratory supplies. Next in financial needs is more money to employ faculty members, to lessen the strain on the present staff. These men are now working night and day. Many of them have not had any concurrent vacation or leave of absence for two and three years. The best efficiency cannot be maintained under these conditions. The third financial need is for some additional buildings such as barns for sheep and beef cattle, a new poultry house, and a paint room for the aeronautics department to eliminate a present fire hazard. The livestock buildings are necessary to replace antiquated structures now in use, and to provide facilities for the constantly increasing demand for project animals as the agricultural enrollment increases.

While this financial need is a pressing one, there is even a greater need for a better understanding and appreciation of this school on the part of educators, legislators and the public generally. During the last two years, the School has been visited by a number of persons, including owners and managers of large agricultural and industrial enterprises; educators and parents of present or prospective students.

There has not been a single instance where the visitor has failed to be thoroughly astonished at the facilities for sound training, the quality of instruction or the accommodations for the students. Many persons have come as

skeptics and left as enthusiastic boosters. Their enthusiasm is genuine, for reports of their utterances to acquaintances repeatedly come back to the School.

The School needs the opportunity to thus show itself to every interested agency in the State. It needs to be the meeting place for every available agricultural organization, cooperative association and educational groups. It should be visited by every legislator and every tax-payer. The institution is the oldest in the State teaching agriculture, established 31 years ago; yet its functions and possibilities are virtually unknown except to those who come in frequent contact with it.

The third need is to extend this same possibility of personal visitation to the high school graduate. Every state today has the responsibility of a very crucial social problem--the unemployed youth. Permanent work is open to few below the age of 21 years, and there is a gap of two or three years between high school graduation and employment. At the present time, hundreds of boys are drifting aimlessly. Hundreds more are "going to school" in local institutions, just to be occupied with something. They lack the finances and in many cases the academic aptitude to take proper advantage of junior college, college or university courses. The low cost of matriculation at the California Polytechnic School, averaging only $300.00 per student per year for all expenses, puts this institution in the reach of hundreds who would be greatly benefitted by this type of instruction if they could have its possibilities unfolded to them. Even this low cost can be reduced through project profit and student labor. The average student this year will earn more than one-third of his expenses.

The California Polytechnic School is slowly moving toward its real function in the educational system of the State. Its enrollment is increasing, and the quality of student is incomparably higher than it has ever been before. It has an excellent, loyal faculty. It is perfectly coordinated with the

vocational program of the State. It deserves your friendship, your investigation and your support.

* * * *

Your
VOCATIONAL
OPPORTUNITY

A Bulletin of The California Polytechnic
School at San Luis Obispo, Calif.

BULLETIN OF

THE CALIFORNIA POLYTECHNIC SCHOOL

SAN LUIS OBISPO, CALIF.

The state vocational institute for agriculture, trade and industry.

ADMINISTERED BY

The State Department of Education.

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THE PURPOSE OF YOUR SCHOOL

As a young man living in California, the California Polytechnic school at San Luis Obispo is your school, whether or not you plan to attend. It is the oldest state institution in the fields of vocational agriculture and trade and industrial courses, established and opened in 1903. It is directly administered by the state department of education.

The California Polytechnic school was established 31 years ago to provide "free public instruction in agriculture, trades and industry." Its basic purpose has never changed. The standard of instruction has been constantly raised and the policies of the institution have been altered from time to time. Today, the school offers to the young man of California an opportunity for training in a modern and practical technical institute valued at more than a million dollars in lands, buildings and equipment. If you are qualified to attend, these educational facilities are yours for the asking. There is no fee for tuition.

The purpose of the division of agricultural education is to provide young men with general and specific training of advanced level in farm practices and agricultural sciences, leading to self-enterprise or employment in agricultural industry.

The purpose of the division of industrial education is to give young men the skills and technical information necessary for them to advance after employment into positions in industry on a level that is between the journeyman worker and the college engineering graduate.

YOUR CHOICE OF COURSES

The wide range of course offerings makes it possible for you to specialize in any one of 18 different fields, grouped under six departments. The primary departments in the division of agricultural education are meat animals, dairy, poultry and horticulture. The primary departments in the division of industrial education are aeronautics and electrical industry.

The three special fields in the meat animals department are in the production, management and marketing of beef cattle, sheep and swine. Those in the dairy department are in production and marketing of milk or dairy animals, and dairy manufacturing. Special fields in the poultry department are in commercial egg production, and hatchery operation. The horticulture department offers specialization in truck crops, fruit crops and landscaping and plant propagation.

ADMINISTRATION BUILDING
Administrative and Business Offices Here.



The three special fields in the aeronautics department lead to training of aeronautical draftsmen, airplane engine mechanics and airplane mechanics. The electrical industry department has specific training for automatic industrial control technicians, electrical maintenance men for industrial plants, armature winders and electrical machinery repairmen, power plant and substation operators and communication technicians. In addition to the catalogue offerings, the student may choose almost any field in the electrical industries for specialization.

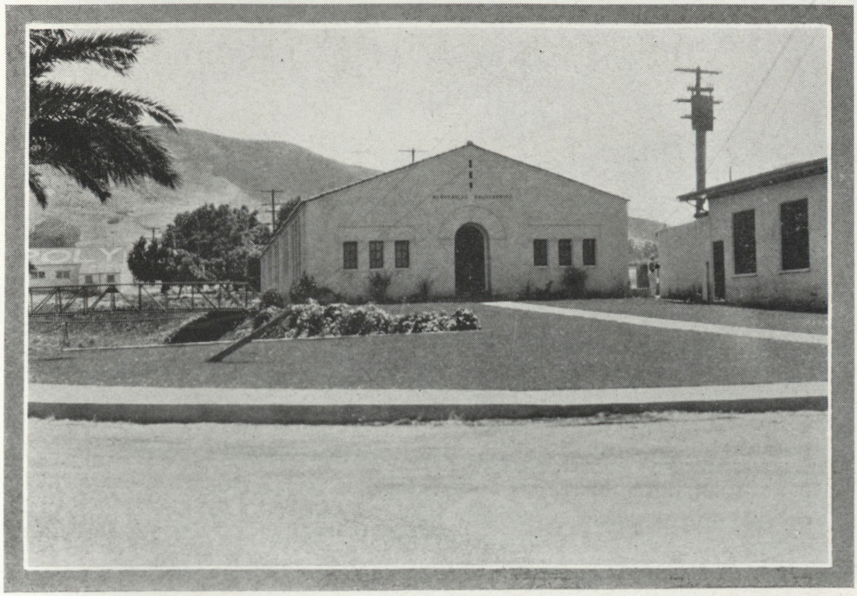
YOUR NECESSARY EDUCATIONAL BACKGROUND

The courses at the California Polytechnic school are divided into lower-division and upper-division levels. Both levels are vocational in character. The lower division courses are designed to bring all students to a standard in skills and knowledge enabling them to enter and profit by the upper division courses.

If your high school curricula and background have adequately prepared you for a major course at the California Polytechnic school, you will normally enter directly in the upper division work and should complete the course in two years. Students desiring to receive training in more than one major field, or take a major and a minor course, should expect to spend three years in the upper division.

If you lack special preparation, it will be necessary for you to complete the year of lower division work before enrolling in the upper division courses. Your status will be determined by your previous school work and entrance examinations. The lower division courses offered are primarily to form a foundation for the vocational majors.

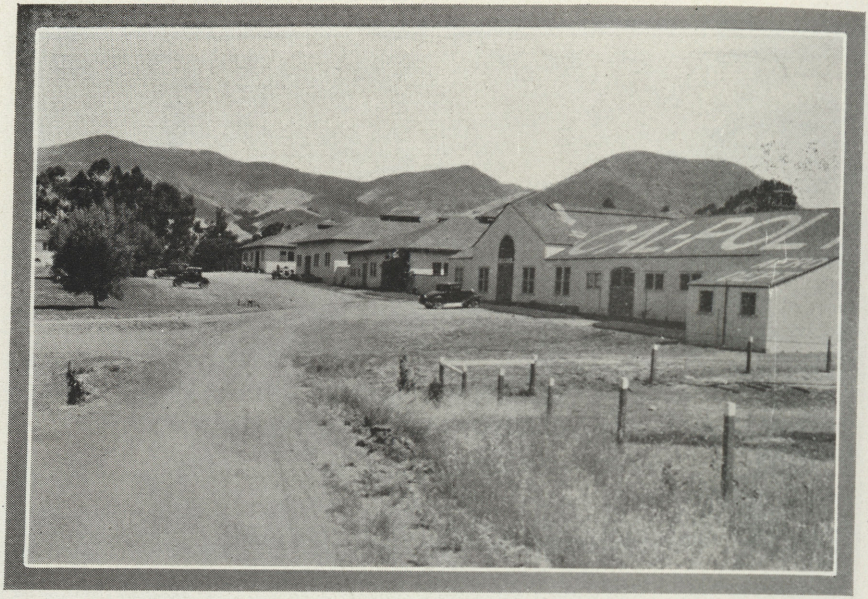
ELECTRICAL INDUSTRY LABORATORY
Power Plant to the Right.



LIVESTOCK BARN
For Young Dairy Projects.



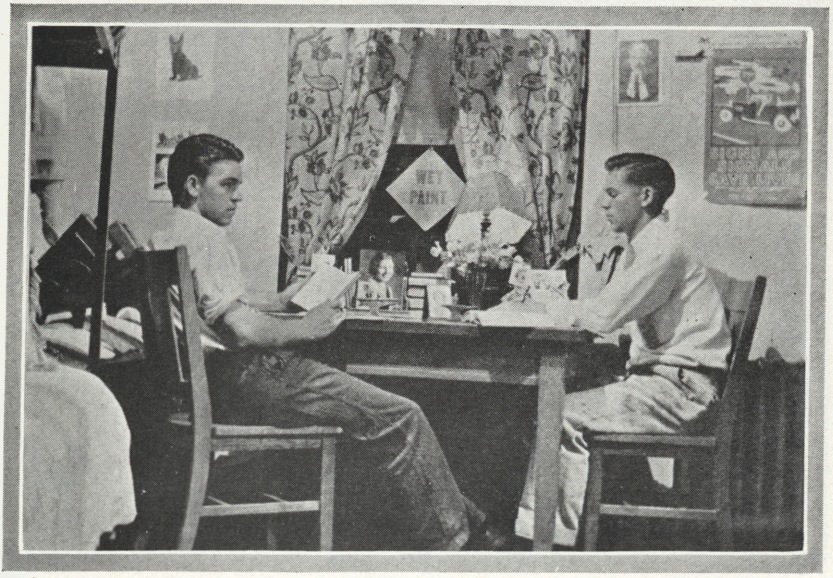
INDUSTRIAL SHOPS
For Aeronautics, Related Subjects.



CHASE HALL DORMITORY
Typical of Four Campus Residences.



A DORMITORY ROOM
Attractive Student Home Surroundings.



Any California high school graduate who has fulfilled the state requirements for high school graduation, is eligible to attend. However, each entering student must in addition show evidence of good character, scholastic ability and genuine interest in a field of agriculture or industry. No fixed scholastic attainment in high school is required.

If you are planning to enter the agricultural courses here, you should have training and aptitude in your high school agriculture and science courses. If you are planning to enter the industrial courses, similar emphasis must be placed on mathematics and industrial courses.

Equally important is your background of experience. Previous agricultural or industrial work will be of material benefit and may balance a deficiency in high school vocational courses in these fields. Your high school preparation in English, history and civics should give you adequate foundation for the major and related subject matter at California Polytechnic.

In addition to enrolling high school graduates, the California Polytechnic school is open to a limited number of students who lack that foundation. If you will have reached your 17th birthday anniversary on or before September 1, 1934; have completed at least two years of high school and give evidence of exceptional practical experience or training equivalent to that of a high school graduate, you are eligible to enroll. Each request for such admission is acted upon individually. If you desire to attend Polytechnic and lack high school graduation requirements, you should give full particulars in requesting admission.

WHY YOU MAY CHOOSE THIS SCHOOL

Almost every college, university or technical institute offers some par-

ELECTRIC LABORATORY EQUIPMENT
Students Learn Many Operations.



ticular advantages to its students. Various institutions have different appeals to students seeking instruction in general and specific fields. The following are some of the particular advantages of the California Polytechnic school which may appeal to you.

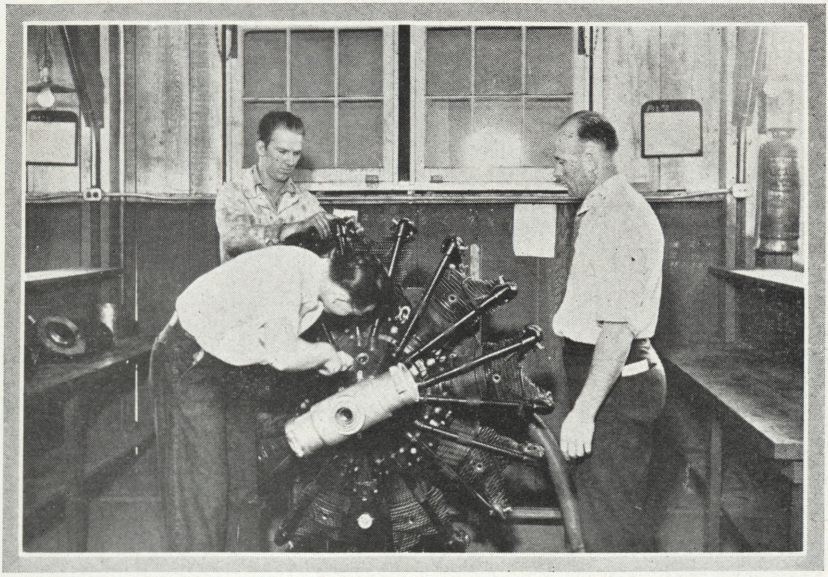
Of primary interest is the quality of instruction. Every faculty member in the major field has not only had years of teaching experience, but also a considerable period of actual participation in the commercial field. This has given them a thorough understanding of the practical, money-making phases of the course as well as the technical knowledge.

Of equal importance is the student project fund, a revolving fund which supplies capital for student-owned enterprises. Any recommended student conducting an enterprise during the school year may borrow from this fund at a nominal rate of interest, with the project itself as security. Profits are divided between the fund and the student on the basis of contracts made when the enterprise is started. Through careful management, the fund has been steadily growing. No other institution of statewide scope has such a revolving fund.

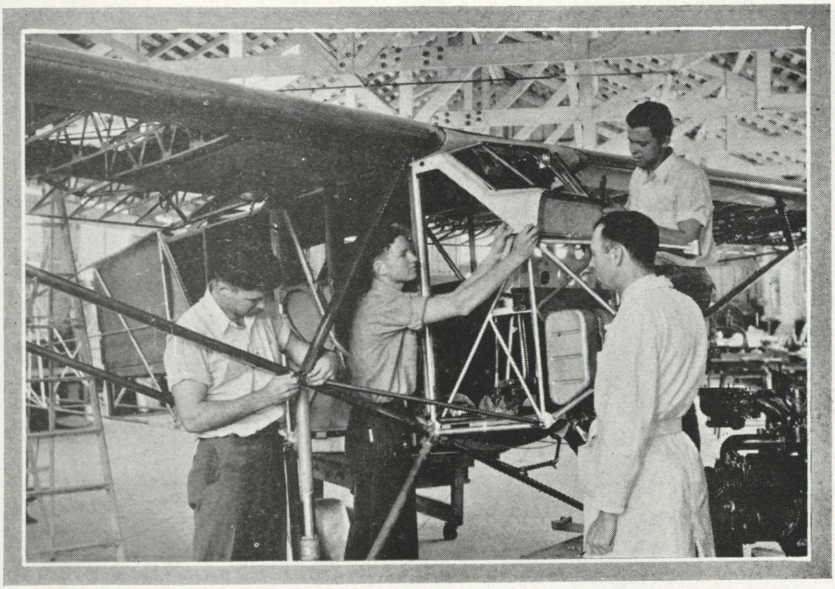
A third advantage is the possibility of specialization in fields not found in the catalog offerings. Being directly administered, the Polytechnic school may set up its own courses and standards to the best interest of the student. Thus if sufficient students desire special training in any particular field, a class may be set up at once for them. Some of the fields in which special work may be established are the training of inspectors for agricultural commissions, Diesel engine operators, printers, farm cost accountants and similar special vocations.

Completeness of training is another distinct advantage. The aeronautics

AIRPLANE MOTOR TRAINING
Students Learn to Time Engines.

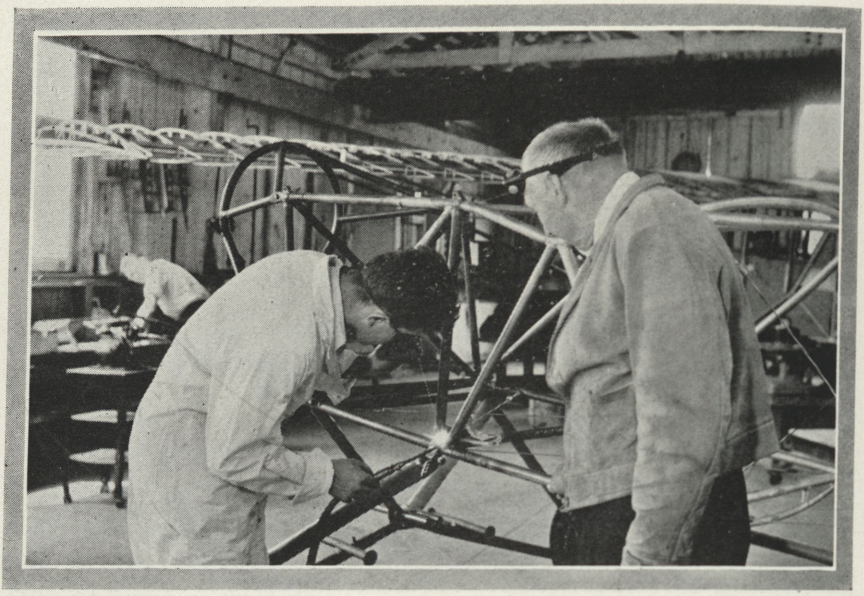


AERO FUSELAGE REPAIR
Complete Rebuilding Practiced.



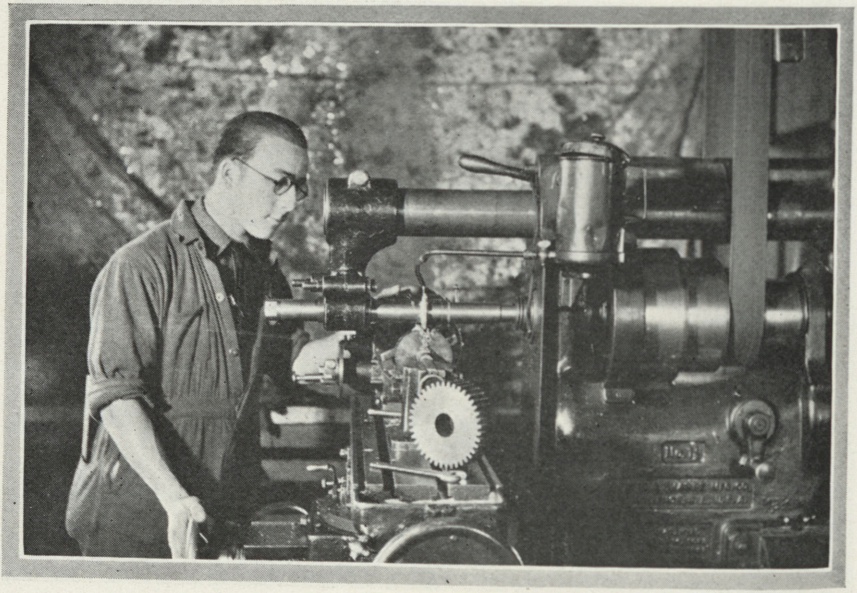
AERO WELDING TRAINING

Necessary for U. S. D. C. License.



MACHINE SHOP PRACTICE

Serves all Industrial Students.



BEEF CATTLE PROJECT
Student Builds Own Foundation Herd.



department at California Polytechnic is the only one in the west in which the student gets in addition to his other training, complete foundation in machine shop, aero welding and forge work. The student who completes the California Polytechnic school course is trained to fabricate parts as well as make the repairs and adjustments. The aero shop occupies 11,000 square feet of floor space and provides adequate space for working on three to four repair jobs at one time. The other equipment such as instruments, motors, sheet-metal equipment, covering equipment and hand tools is the most complete in the west.

The electrical industry equipment is as complete. Various tools and instruments ordinarily kept in glass cases for students to inspect in the average institution are in daily use and practice in the electrical industry department at Califorina Polytechnic.

Another outstanding advantage is the fact that every course offered has a direct relation to the major interest of the student. The young man who has selected a vocation and seeks to fit himself as rapidly as possible for that field ordinarily does not desire a variety of general, academic courses. At the California Polytechnic school, you will not be required to spend hours each day in non-related course material.

These are some of the factors which may be of interest to you in selecting your future educational institution.

WHERE YOU WILL LIVE

The most desirable student residence is in the campus dormitories, and you will be required to live in one of these buildings except upon especial ruling after enrollment. The only exceptions made are students who have

DAIRY CATTLE ENTERPRISE
Purebred Family Raised for Home Farm.



employment off the campus, or those living in the San Luis Obispo district with relatives.

There are four modern dormitories of stucco construction. Each is equipped with showers and comfortable recreation rooms. Student rooms each hold two persons. The rooms are equipped with double-decked iron beds, mattresses, study table, dresser and other facilities. Beyond these essentials, students furnish and decorate their rooms according to their own tastes. Each boy will need his own blankets, bed linen and towels.

While you will find a dormitory superintendent in charge of each building, the major responsibility will rest with you as a student in how you conduct yourself and spend your time on and off the California Polytechnic school campus.

As a campus resident, you will eat in the school dining hall adjacent to the dormitory group. Like the dormitories, the dining hall is conducted as a student cooperative project on a non-profit basis. Menus are planned for the growing young man with the purpose of providing a healthful and attractive diet at the minimum cost to the student.

WHAT IT WILL COST YOU

This is one of your most perplexing questions, yet a problem which must be faced squarely. Virtually your only expenses will be for lodging and clothing—expenses which must be met wherever you may be.

Financial records kept by students during the last two years show that an expenditure of $300 per year will provide you with your room, board, campus clothing and a moderate amount of recreation. The cost for textbooks and supplies varies in the different major courses but in no instance

SMALL FRUIT CULTURE
One of Many Horticulture Fields.



is it more than $15 to $25 per year. Student body membership is recommended but is not compulsory. It costs $7 per year.

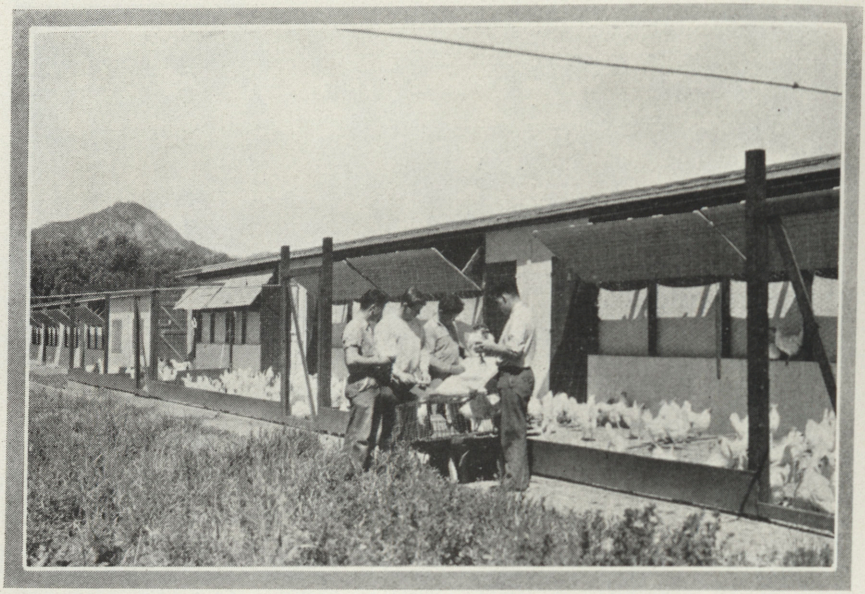
Expenses which should be included in the cost for a year are, room approximately $6 per month, board approximately $21.50 per month, personal laundry $1.50 per month, campus clothing $20 per year and $25 per year for recreation. The student who brings his own car, furnishes his room beyond the essentials or frequently returns to his home a considerable distance away for week-end trips or vacations, will of course spend considerably in excess of the average figure.

No student should consider enrolling who does not have assurance of a fixed allowance for his education. While a considerable amount of part-time employment is available, and some profit may be expected from project operation, this should be considered as the exception rather than the rule. Student labor must be given to advanced students of proved ability, while low commodity prices make project profit uncertain. Students who are able to complete part or most of the year with their own finances are given every opportunity to complete the year with the aid of student labor. No entering student, however, should definitely plan on this income.

The entering student should have at least $70 for room and board deposits, expenses for the first month and student body fee.

Deposits required are $15 for dormitory room and board and $5 for laundry. All deposits are refunded at the end of the year, or may be applied on the last month's expenses. Fees payable upon registration are $5 for medical service, $7 for student body membership, $2 for towel and locker service and $5 for breakage. The latter amount is also refunded if there are no charges for breakage or lost tools. In addition, the entering student must pay approximately $27.50 for the first month's room and board.

SECTION OF POULTRY UNIT
Selecting Birds for Flock Mating.



WHAT YOU WILL DO

Your day's program at the California Polytechnic school will include adequate time for classroom lecture and recitation, laboratory practice including project operation, physical education and recreation. In most of the courses, lecture and recitation periods are scheduled in the morning and laboratory periods in the afternoon.

Rising bells in the dormitories start the day, and breakfast is served in the dining hall in adequate time to allow the student to be prepared for his first class. An activities period is provided each day for physical education, athletics, band, club meetings and other functions.

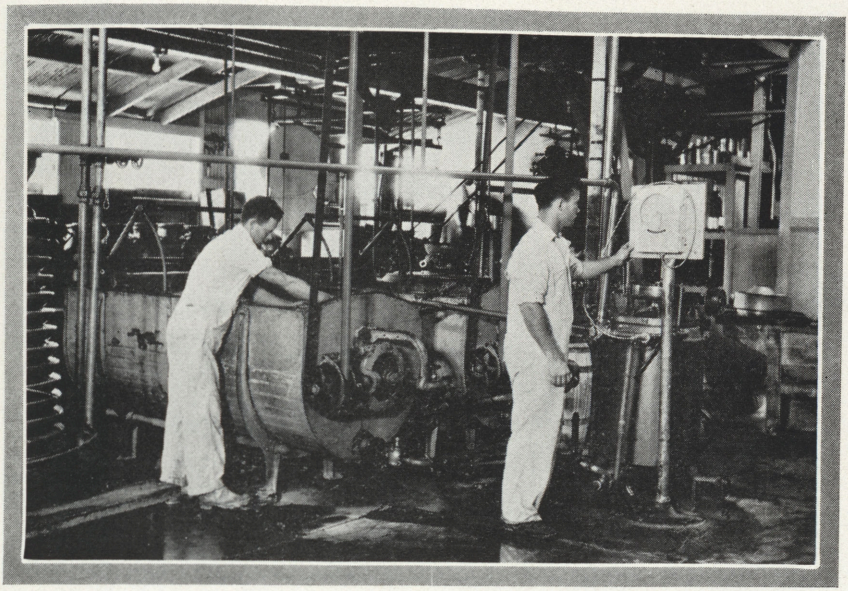
Following luncheon comes the laboratory schedule, and this is closed in adequate time to permit practice for athletics contests, part-time work or study. This time is also frequently used for sports such as tennis, golf or handball; trips to town or room clean-up.

The student body conducts a health service, employing two physicians at a fixed rate per student per year. One physician is on the campus an hour each day for consultation and treatment of minor injuries and illness. In case of hospitalization, low rates are provided for the student group. One of the physicians is also the athletics teams doctor and accompanies the squads on trips as well as attending campus contests.

YOUR CAMPUS SURROUNDINGS

The California Polytechnic school campus will appeal to you. It is outside of the San Luis Obispo city limits and forms a community of its own. Vine-covered buildings and an increasing number of green lawns make it an attractive area.

DAIRY MANUFACTURING TRAINING
Two Local Creameries Furnish Labs.



FARM MACHINERY REPAIR
Complete Training Offered.



CLASSROOM BUILDING
Typical of Campus Structures.



SUCCESSFUL GRADUATE
Employed in 50,000 Bird Enterprise.



MAKING GOOD ON THE JOB
Telephone Plant Uses Trained Graduate.



The campus proper with its major buildings occupies about 85 acres. The rest of the 1400 acres is taken up with the farm area, devoted to raising truck crops, grain, field crops including barley and alfalfa, and to range land for the beef cattle and sheep herds.

Laboratory equipment in the aeronautics department includes many series of motors, types of propellors and examples of wing construction. Annual projects include a number of ships brought in for rebuilding. In the electrical industry department, equipment includes all types of electrical machinery and the school-operated power plant. Projects include various wiring and repair jobs on the campus.

Laboratory equipment in the agriculture division includes purebred breeding herds of 85 head of beef cattle, 90 dairy cattle, 100 sheep, and 40 swine; a number of excellent horses, 3000 high-producing birds in the poultry plant, greenhouses, lath-houses and many acres of ground for plant propagation and growing of crops and small fruits.

The agriculture and industry of California furnish additional laboratory facilities. The various fairs and livestock shows provide opportunity for the agriculture students to exhibit and compare the results of their project work. Trips to livestock, dairy and poultry farms are taken at intervals. Horticulture students visit parks, orchard and truck crop enterprises. The aeronautics students make an annual trip to engine and fuselage plants and commercial airports; and students in the electrical industry department visit various commercial enterprises.

Laboratory equipment for the dairy manufacturing students is provided through the cooperation of two local creamery plants. Students work part of the day in these plants under school and plant manager supervision. The

STUDENT BAND ORGANIZATION
Free Music Training Offered.



recommendation of the plant manager is a valuable aid to placement of graduates in dairy manufacturing.

Student projects in the agricultural fields depend upon price ranges and the ability of the student to successfully manage and market the product. At present, individual meat animals students are raising up to a carload of lambs or barrows, and from one to six beef steers. Dairy students have from one to five dairy animals as projects, and poultry students care for as many as 300 hens in laying flocks. Horticulture student projects vary with the individual desires. These projects are an integral part of the student training—not a separate, commercial enterprise.

YOUR CAMPUS ACTIVITIES

Your campus life will give you an opportunity for as many extra-curricular activities as your time will permit. If you enjoy music, you will find an outlet for this avocation in the band, orchestra or glee club. If you have dramatic ability, the programs presented at student assemblies and club meetings provide ample participation.

In the field of intercollegiate athletics, California Polytechnic has five varsity sports: football, basketball, baseball, track and tennis. When talent is available, a golf team is also organized. Intercollegiate competition is provided through junior colleges, state teachers' colleges and private schools. California Polytechnic is in the Central Coast junior college conference.

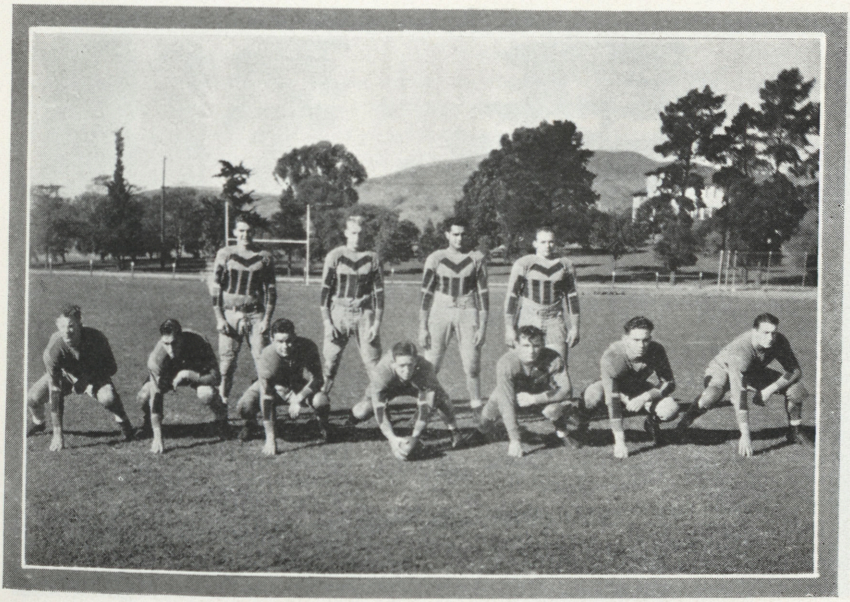
Varsity football last year was marked by a team which was undefeated, untied and unscored-upon throughout the season. Poly placed second in the conference in basketball, lost the track trophy by four points and lost in a playoff series for the baseball championship. The tennis squad had no regular schedule but met opponents in a number of tournaments.

Intramural sports include boxing, wrestling, handball, tennis and basketball, with competition between departments. In addition to athletics and music, campus organizations provide opportunity for considerable activity. Groups in the division of industrial education include the Aero club and the Polyphase club. The agriculture students have a chapter of the national organization, the Future Farmers of America. Among the important school

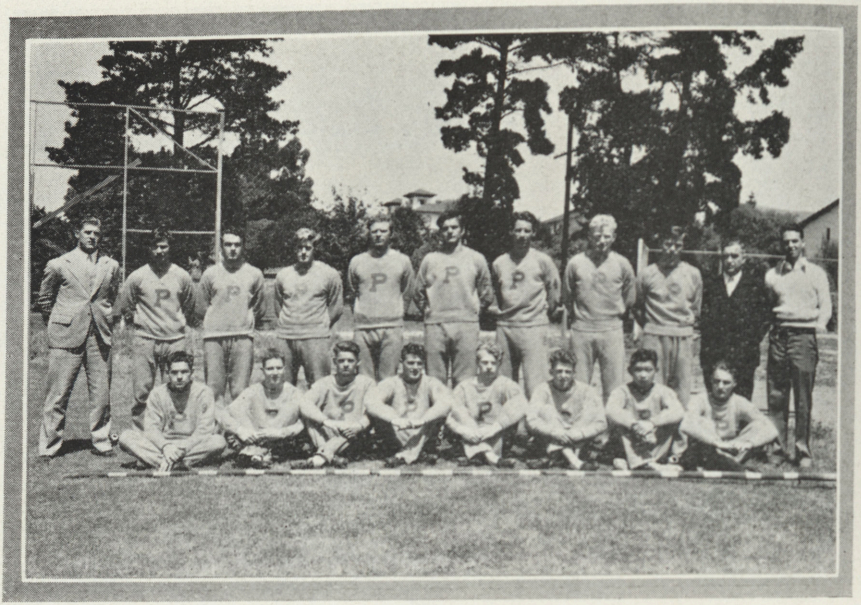
STUDENT AFFAIRS COUNCIL
Students Make, Enforce Own Regulations.



UNDEFEATED FOOTBALL ELEVEN
No Team Reached Their 10-yard Line.



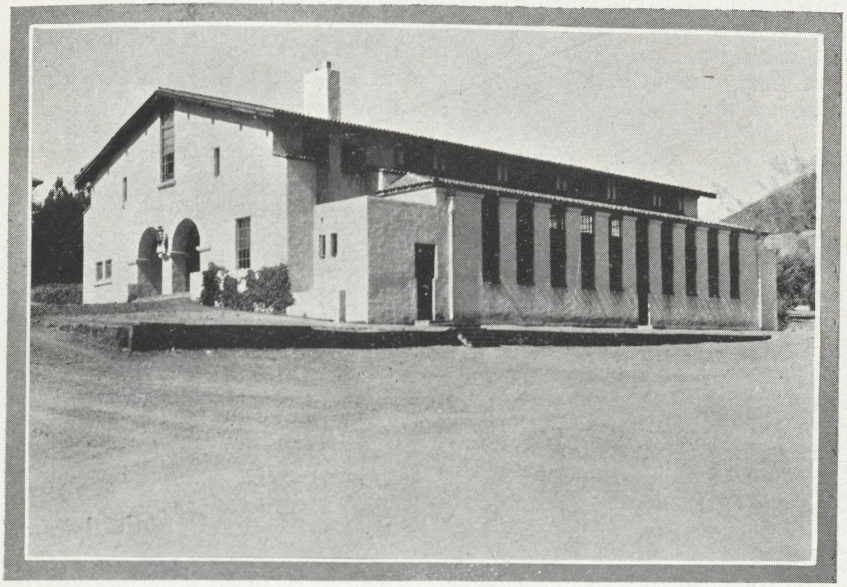
SUCCESSFUL TRACK SQUAD
Second in Conference Meet.



POLYTECHNIC BASEBALL SQUAD
Close in Championship Race.



NEW GYMNASIUM BUILDING
One of the Finest in the State.



events are the annual Homecoming, Christmas party, May Day picnic and the Poly Royal agricultural show.

Other campus clubs are the Block "P" society for lettermen, the Poly "Y" club and dormitory clubs.

YOUR OPPORTUNITIES UPON GRADUATION

During normal times, in the great primary fields of agriculture and industry, there is a marked demand for young men whose education has combined the technical knowledge of commercial practices with the necessary skills of the actual operation. There is a distinct field between the man who can perform the labor without the executive capacity, and the man with the executive capacity but lacking the training necessary to perform the practices.

It is in this field that the California Polytechnic school designs to train its students. Because employment either in self-enterprise or for others is the goal of the graduate, the school employs two men who each devote part of their time to contacting prospective employers in the fields of agricultural and industrial operations.

Among the students placed in the agricultural field are those in livestock enterprises, creamery plants, hatcheries, poultry breeding flocks, nurseries, livestock yards and feeding plants and many in their own enterprises. Among those placed in the industrial field are students who have taken positions with telephone and X-ray concerns, in industrial welding, power plant operation, airports, airplane engine plants, and in the United States army aviation corps. In the aeronautics department, graduation is based upon passage of the United States department of commerce license exami-

nations, given by a D. C. representative. In addition, the department of commerce man visits the school plant each month, and student work counts towards license requirements.

With the placement men constantly seeking employment for recommended graduates, your opportunities for jobs are improved over the graduate without such assistance, and in proportion to the business conditions of the times.

YOUR GRADUATION CERTIFICATE

The California Polytechnic school does not grant degrees. Instead, the student upon satisfactory completion of his course will receive a certificate of completion. This will indicate that the student has met the requirements in his major field and has received passing grades in the required number of units.

In addition to this certificate of completion is the certificate of accomplishment. The latter is a recommendation for placement in the field or fields in which the student has given evidence of outstanding ability.

The certification of accomplishment is an individual award based upon the scope and degree of perfection shown by the student. It may offer a recommendation in one or several vocational fields in which the student has shown particular ability.

Students who do not go into self-enterprise frequently enroll for an additional period of training known as supervised commercial practice, The student is placed in a commercial enterprise in his major field, receiving such salary as the job may pay. He remains under the supervision of the school through its placement men. At the completion of the year or when entering permanent employment, the owner, foreman or manager of the enterprise in which he has been employed also signs the certificate of accomplishment as additional recommendation.

HOW TO ENROLL

If you are a high school graduate, it is not necessary to send a transcript of record with your enrollment application. If you have had less than the required units for high school graduation, you should send a transcript of record from the school or schools attended.

Registration is now open for the fall semester, and resident registration will begin on the campus, Friday, August 10. First classes will start August 14 and it is essential that all entering students be on hand prior to the final date of registration. Limited facilities make it necessary to enroll only the number of students who can be adequately accommodated in the class schedule and dormitory quarters. Further applications will be placed upon file and taken up in the order of their receipt.

It is not necessary to send any funds with application for enrollment by mail, but all deposits and fees must be paid before the student is admitted to class instruction. A late registration fee of $2.00 will be charged for all students enrolling after 5 o'clock, August 31.

Detailed information concerning each course is available in folder form. Please use the accompanying blank in requesting such information mailed to you. If you are interested in more than one course, you may indicate your desire to receive two or more of these pamphlets.

Vocational Agriculture

In California Secondary Schools

BULLETIN NO. 1

A Sheep Manual For California Future Farmers



A FUTURE FARMER PROJECT FLOCK

PREPARED BY

J. I. Thompson, Livestock Specialist for the Bureau of Agricultural Education, State Department of Education.

SPONSORED BY

The Bureau of Agricultural Education of the California State Department of Education, and the California Polytechnic School, San Luis Obispo, California.

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FOREWORD

The Bureau of Agricultural Education of the California State Department of Education recognizes the importance of the sheep industry in California agriculture. In sponsoring the publication of this bulletin, the Bureau recognizes a debt to a widespread farm enterprise; and hopes to perform a service by helping to better train those future sheepmen of the state. The advice and suggestions contained herein, disseminated to the Future Farmers of America in California through their chapters and advisers, are given in the desire to increase the efficiency of the coming generation of wool and mutton producers.

Sheep projects are becoming increasingly important. In 1932-33, when prices were most discouraging, 192 high school vocational agriculture students owned 4158 head of sheep, producing 45,900 pounds of lambs, 2500 pounds of wool and 532 head of breeding stock. Last year, considerable increase was shown. These figures show a definite field for a sheep manual.

The author, Mr. J. I. Thompson, livestock specialist for the Bureau, says: "The purpose of this manual is to furnish to California Future Farmers fundamental information on sheep production and management, in the hope that it will be useful in the establishment and development of high class flocks.

"The raising of sheep in California can be profitable and enjoyable, and is one of the most practical ways of using the grass, grain and hay grown so abundantly in this state.

"There has been no attempt to make this pamphlet a complete reference on all phases of sheep husbandry. The suggested references will furnish much additional valuable information. And I want you to know that my good friend and yours, Professor Robert F. Miller, Sheep Specialist, College of Agriculture, University of California, has approved this material and has helped select and arrange it."

We heartily second Mr. Thompson's thanks and acknowledgment to Professor Miller.

It is the desire of the Bureau to perform similar services in other branches of the agricultural industry. We hope this bulletin meets a real need and fills it.

J. A. McPHEE,
Bureau Chief and State F. F. A. Adviser.

VIERLING KERSEY,
State Superintendent of Public Instruction.

A SHEEP MANUAL FOR CALIFORNIA F. F. A. MEMBERS

Outlook for sheep raising in California and other western states. Two distinct kinds of sheep raising are found in California and the other ten western states. Until about 1915 nearly all of the production was on the range, and while it is still much the larger and more important part of the industry, the production on farms has increased immensely. Prior to 1917 the relatively low price of grain had not shown the economical advantages of mutton and wool sheep as a quick source of income for the medium to small farms or ranches, where considerable amounts of pasture, stubble, forage crops and roughages were available.

The low labor requirement had also been overlooked. The higher prices for sheep and sheep products about 1917, due to a large decrease in numbers and several other reasons, caused a renewed interest in the business. Numbers increased slightly until after the war, then decreased somewhat until 1923. Following this, a gradual yearly increase set in and continued until 1932, when the total was 45 per cent greater than it was nine years before. For the entire United States the number of ewes, not counting lambs, has decreased but very little, but in the last two years the total in the eleven western states has decreased about one million, including a drop of about 200,000 in California.

Of special importance to the California outlook is the fact that Tennessee, Kentucky, Virginia and Missouri have learned to produce early spring lambs and are furnishing plenty of competition for lambs from California that reach the central western markets in April and May. But there has been a decrease in the total number of sheep in the entire country in the last two years, most of it in the eleven western states, and the proportion of ewe lambs to older ewes is the lowest that it has been for many years.

Since wool prices have moved up, about 155% from the low spot, prices of pelts advanced accordingly, with the result that fat lambs have been selling at from one cent to four cents a pound higher than hogs.

Because sheep make such excellent use of alfalfa and many other crops grown on typical California farms and at a low labor cost, and are so well adapted to the arid west and since supplies are not burdensome, the sheep business will surely continue to be one of the major livestock enterprises of this state for many, many years.

In 1933, California ranked fifth in total sheep population, but in spite of this large number, we ship in about three times as many as we ship out. Some of those shipped in are for immediate slaughter, others are feeders and the remainder are ewes for replacements in breeding flocks. If the people of a few other states should change their meat-eating habits to correspond with California, the demand would exceed the supply. The average annual consumption of lamb and mutton for the entire country is only 7.1 pounds per person, but for California it is 16 pounds.

Only a few years ago, 75% of all sheep production was west of the Mississippi river, but 68% of the consumption was east of it. Our home market is rapidly developing into our best market, but large shipments of spring lambs will probably go east for many years, due to the heavy surplus of milk-fat lambs in April and May. In a typical year this number is 450,000 to 500,000.

Requirements for sheep raising. Most of the regions of the western United States are suitable for sheep raising so far as soil and climate are concerned, but some small areas are not especially desirable. Extreme summer temperatures, such as are found in the Imperial Valley in California, are not suitable for rapid and economic growth of lambs, but in this same valley a great many are dropped and fattened during the winter months and a large number are shipped in as feeders and fattened, principally on alfalfa pasture.

Pasture and feed. Extensive grazing areas, affording a great variety of feeds, are desirable. Sheep like best the short, fine grasses, but can and do consume considerable amounts of coarse feeds and brush. When they are raised under farm conditions, perhaps the most important item is sufficient pasture suitable for them. Unless desirable grazing is available for from six to nine months of the year, the profits from the sale of market lambs and wool will not be encouraging.

Pasture may be native grass, or some sown crop.

Alfalfa and ladino clover are excellent but there is danger of bloat from alfalfa and care must be exercised to prevent excessive losses. In some areas no trouble is encountered while in others, losses from bloat, particularly on alfalfa that is growing rapidly, are often very heavy. Sudan grass is being grown more extensively each year, for it is safe and has an enormous carrying capacity. Sudan may be harmful after it has been frosted or frozen, but so far as I know, losses from this cause have not been heavy. But since Sudan is low in protein, growing lambs do much better on it when allowed a small amount of additional protein, such as cottonseed meal.

Stubble fields, vineyards, orchards, cut over hay fields, provide suitable grazing at various times of the year. Some orchards, especially peach and olive, can seldom be used, for sheep like the bark of these trees as well as they do most grases. Perhaps walnut and almond orchards are utilized most for sheep, after the trees are four or five years old. In some regions citrus groves are pastured part of the time. Root crops furnish excellent sheep feed, but the cost of growing them usually prohibits their substitution for pasture, except in the fitting of sheep for show.

Buildings—fences. Some natural shade and running water are very convenient and valuable. Where no natural shade exists, an artificial one should be provided for the summer months.

Such a shade may be cheaply constructed by setting fence posts about eight feet apart, three rows, and whatever length is required for the number of sheep. Connect the posts at the top with two by six's, lay old boards or woven wire across them, and use straw, weeds or brush for a covering. If the straw is green when put on, it will be less inclined to blow off than if put on dry. A shed that is dry and free from draughts is all that is needed in most parts of California for winter use.

Adequate fencing is important, preferably boards around the smaller corrals and woven wire for the pastures. Let me suggest that you figure out with your agricultural mechanics teacher whether or not 39-inch woven

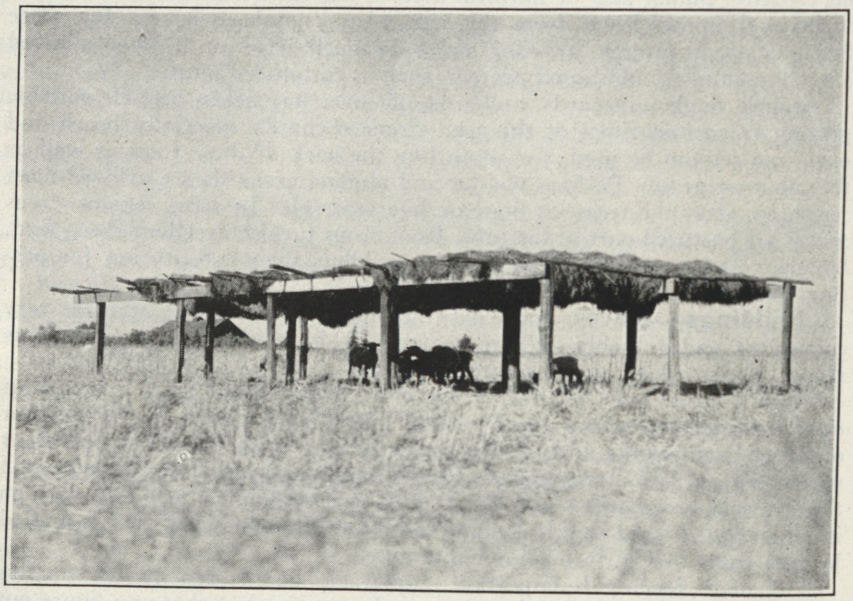
wire is not perhaps the cheapest and most efficient sheep fence, rather than 24-inch woven wire and two or three barbed wires. Sufficient lots and pastures should be provided so that sheep of various ages, sex and condition may be kept separate whenever necessary for the most economical results. Since labor costs must be kept as low as possible, adequate equipment is very important, if each individual is to secure maximum returns for his labor.

The labor requirement in sheep production is low compared to other classes of livestock of equal value, but if the gates are faulty; corrals, cutting chutes, and similar equipment are not available, it may require two men to do one man's work, or require one man to work twice as many hours as he should to get things done.

WHO SHOULD RAISE SHEEP

As previously stated, some permanent pasture is necessary. If irrigated land is available and not too costly on which Sudan, ladino or similar forage can be grown, this will be found valuable. Some nearby stubble areas, properly fenced, are very useful. A supply of hay, preferably alfalfa, is needed for winter feeding.

Most regions principally occupied with vines, trees and truck crops, where much of the land is not fenced, are not especially adapted to sheep production, although a few may be handled along irrigation ditches, and on adjacent land not suitable for the above crops. Locating a sheep enterprise in a region where it is not a regular business has some awkward angles. Sheep shearers may be hard to find, and especially at just the time of year most needed and the dog problem is often a serious one. Local stores may not carry needed supplies such as wool sacks, twine, sheep shears, etc. But if the



CHEAP, EFFICIENT SHEEP SHADE

region is well adapted to sheep production, these difficulties can be overcome.

Returns. When lambs are 7 cents per pound and wool 30 cents, the gross return from ewes of breeding age may range from $7.00 to $12.00, depending on the percentage of lambs raised, and the pounds of wool produced per ewe.

Ewes of the mutton or down breeds should produce from 100% to 150% of lambs under farm conditions, and while the wool yield will vary with the breed, 10 pounds is not too much to expect from some of the down breeds in a farm flock. California markets prefer fat lambs weighing from 65 pounds to 80 pounds and will take a few up to 90 pounds. These weights should be easily obtained in from 4 to 5 months on the farm, without creep feeding the lambs, if pasture is abundant and the ewes are good milkers. If you know how much pasture land is required to carry one cow in your locality, figure that the same area will carry five ewes. For the months when no pasture is available, figure the same amount of feed for five or six ewes that would be required to keep one good milk cow in the proper condition. If the ewes lamb at the beginning of the no-pasture period, more feed than this may be needed to produce a good milk flow.

STARTING WITH SHEEP

Time. It is usually easier to buy ewes during the summer months in California, any time after the lambs have been weaned and before the breeding season starts. But since the number required by a Future Farmer boy is small, suppose we set November 1 as the time to start, for by that time most of the ewes that are to produce market lambs have been bred and this will eliminate the necessity of buying a ram the first year.

More important than the number and kind with which a start is made, is the fact that the greatest single factor leading to success or failure of the sheep project is the boy himself. Careful feeding and management, doing the right thing at the right time, is the biggest item.

Most boys with little or no experience should perhaps begin with not more than four or five grade ewes, say three or four years old. If you are aiming at a permanent project, pasture and sheds should be available ultimately for at least forty ewes. This number is perhaps the proper unit, and from there up the number may be two or more times this unit.

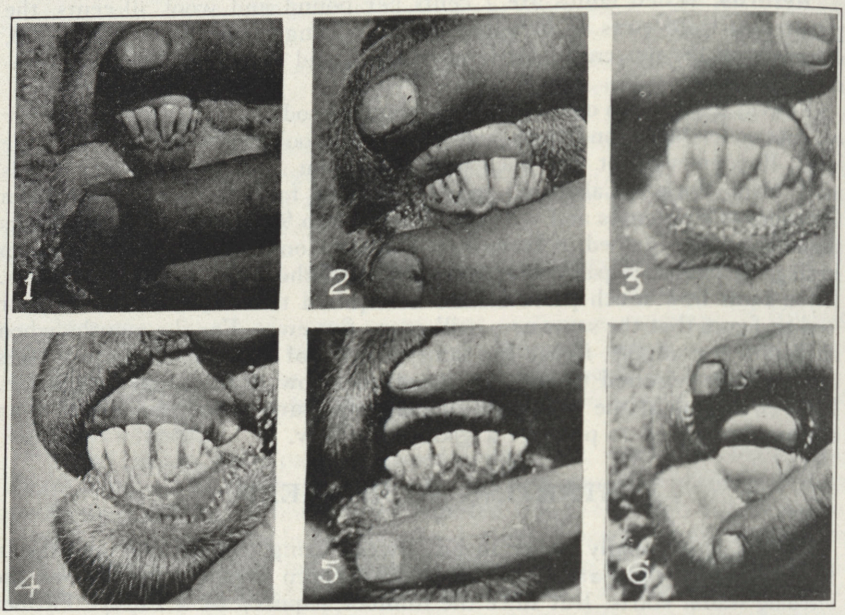
These grade ewes, probably of Rambouillet breeding, should be healthy, strong, have level tops, sound udders and teats; be uniform in type, and carry a fleece of reasonable density and fineness and be in good, thrifty condition. They should be bred to a good purebred mutton ram.

Teeth. Examine the teeth carefully, especially if you suspect that some of the ewes are more than four years old. If the front teeth are in good condition, it is reasonably safe to assume that the others are. If the front ones are broken, it is probably better business to let some one else take the risk on that individual.

When you are buying young ewes or a ram, be sure that the teeth hit the pad on the upper jaw. Many miss it entirely. If the lower jaw is too short, it is called "under-shot," if too long, "over-shot." Such a sheep is not so good a grazer as one with a normal mouth.

Udder. Should be soft and pliable, no hard lumps in it, and the halves should be about the same size. There should be no hard cores in the teats,

DETERMINING THE AGE OF SHEEP BY THE TEETH



(1) Lamb showing four pairs of temporary incisors.
(2) One-year-old showing one pair of permanent incisors.
(3) Two-year-old showing two pairs of permanent incisors.
(4) Three-year-old showing three pairs of permanent incisors.
(5) Four-year-old showing four pairs of permanent incisors.
(6) Teeth have all dropped out. This usually happens at 7 or 8 years of age. The sheep is then known as a "gummer." (Cut courtesy U. of C.)

and the size should be uniform. Careless shearers sometimes cut a teat off, and a ewe so injured can raise only one lamb.

Fleece. The entire body, particularly the belly, should be well covered with a reasonably dense fleece, of medium fineness. Many grade ewes show very coarse wool, particularly about the hind quarters. A year's growth should weigh at least 8 pounds and be not less than 2½ inches long. It should be bright, reasonably free from kemp and black fibers, and the crimp or waves should be numerous and regular from the skin out to the tip. The yolk or grease should be evenly distributed, not clotted or bunched in any particular spot.

Purebreds. If you have had some experience with sheep perhaps you can buy some good purebred ewes at a reasonable price, that will make it possible to show both the ewes and their lambs in the breeding classes, provided, of course, that they are registered and that the ram used is of the same breed and registered.

But it is well to keep in mind that the raising and selling of purebreds requires more capital, wider experience in care and feeding, the expenditure of some money for advertising and the establishment of a reputation for efficiency and reliability before many sales can be made at current values.

Most of the really successful purebred breeders produced market lambs

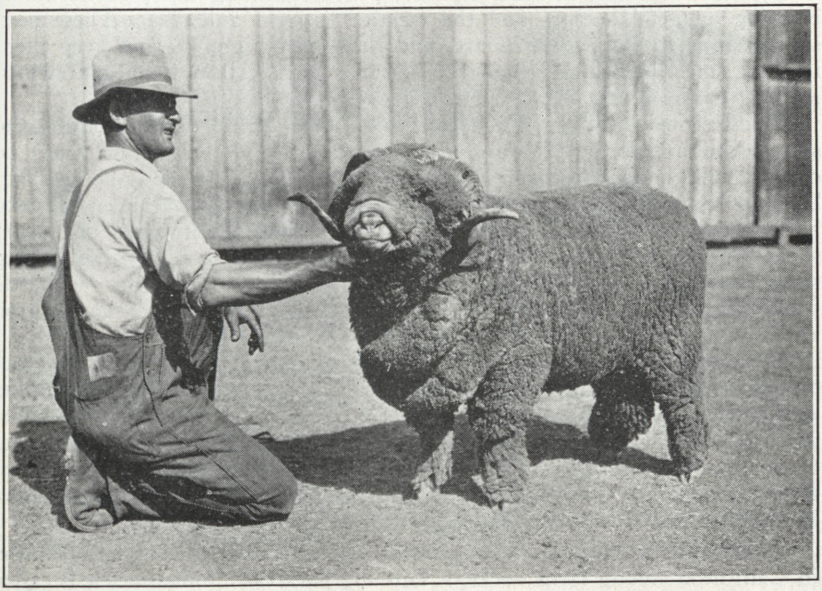
for quite a period and slowly graduated into the purebred business and perhaps that is the course which most Future Farmers should follow. I am sure that one of the most promising fields of endeavor in California, for boys who expect to produce breeding sheep is to develop and carry a flock of purebred but unregistered ewes, mate them with purebred registered rams of the correct type and sell the rams to the range men who produce most of our market lambs.

*There are many text books, bulletins and circulars on Sheep Production that describe the various breeds in detail, so this phase will be omitted from this pamphlet.

The breeds commonly found in California are: Fine Wool—Rambouillets, and a few Merinos in one or two sections. Medium Wool—Hampshire, Suffolk, Southdown, Shropshire and a few Dorsets. Long Wool—Romney, and two breeds of miscellaneous type but perhaps correctly classed as medium wool, Corriedale and Romeldale.

If you decide to raise purebreds, think quite a while before you adopt any other breed than the one or ones most numerous in your region. Of one thing I am certain, it is easier, much easier, to sell all of the good Hampshires you produce in a region where Hampshires are very plentiful than it is where there are only a few. Buyers get the habit of going to the regions where they can see and compare several groups in a short time and where they can find plenty to supply their needs without driving too many miles.

*NOTE: University of California Circular 49 by Robert F. Miller. Sheep Management, Kleinheinz. Breeds of Livestock, Vaughan. Productive Sheep Husbandry, Coffey.



Rambouillet Ram, Bullard's "California Model" 817331. Champion Portland 1933. Bred and shown by Frank Bullard, Woodland, California.

LAMBING TIME

If the ewes are not extremely old, have had good pasture and plenty of exercise, if the ram did his work satisfactorily and the equipment for handling the ewes is efficient, the percentage of lambs saved at lambing time and raised to weaning age is determined very largely by the efficiency of the boy or man doing the sheepherding.

The important thing is to know what to do and then get it done at the right time and in the proper manner.

Buildings, pens. A clean, dry shed or barn, tight on at least three sides, with a good roof is needed. One or more corrals should adjoin the building and if you can keep them from getting very muddy, it will save you a lot of grief.

Avoid driving or crowding the ewes through narrow doors.

Assuming that they are to lamb soon after December 1, keep them exercising a reasonable amount up till lambing day, and limit the hay or grain fed to avoid lambing paralysis.

If the corrals and pens have previously been used by any livestock, clean them thoroughly. Spray the boards with some creosote solution, plenty strong, say 5%. Sprinkle lime on the floor of the pens, and around the fences in the corrals where the sunshine does not hit.

Navel ill, white scours, sore mouths are three common troubles that will be greatly lessened by this procedure.

Ewes that are heavy with lamb should be kept away from cattle, horses and especially hogs. An old sow considers a young lamb a very juicy, tender meal.

Each ewe should be in a separate pen at lambing time, unless she is running on good pasture and the weather is mild and clear. These pens should be about four feet square, and three feet high. Do not keep them in these small pens more than three or four days. Allow lamb and ewe to get out for exercise.

Medicinal supplies. Each Future Farmer should check carefully the supplies he may need at lambing time, and either get them or find where he can get them quickly. Here is a suggested list: One or two long-necked rubber nipples and two long-necked pint or quart bottles. One eight-ounce bottle castor oil, one pound vaseline, two pounds epsom salts, one quart sheep dip, one box soap flakes, one botle milk of magnesia, one box baking soda, eight ounces tincture iodine, two ounces boric acid or one bottle pyoktanin, one pair tweezers, one 4-ounce metal syringe, one package cotton and two or three rolls of cotton gauze.

The uses for these items will be mentioned in connection with the trouble where needed. Avoid as many sudden changes in feed or in the handling of the ewe as possible. You will perhaps begin penning the ewe in the lambing pen at night, two or three nights before you think she is due. Previous to this, trim the wool and dirty tags from around the rump and hind quarters, and from the flanks and udder, so that the new-born lamb will have less trouble in locating the lunch counter.

Lambing paralysis. The greatest single trouble causing severe losses in California among farm flocks, is lambing paralysis. Sometimes it is called preparturient paralysis, and also *Pregnancy Disease of Sheep. Ewes, heavy

*NOTE: Ref. Bulletin 261 North Dakota Exp. Sta., Fargo, North Dakota.

in lamb, are the ones affected, and losses are generally greatest among those carrying twins. Formerly veterinarians believed that only ewes that were excessively fat were affected, but that belief is no longer held. The trouble is generally more severe following poor feed years. When green grass is available in abundance for two or three weeks before lambing, little difficulty is encountered. Most authorities agree that much of the loss can be avoided by compelling the ewes to take plenty of exercise and by avoiding sudden changes in the feed and especially by not being too liberal with the alfalfa hay. If ewes are in good condition, it is safest to not give them any grain.

If you encounter this trouble, here is a typical performance. A ewe quite heavy in lamb, does not come into the barn at feeding time, but stays out in the corral, perhaps standing with her head drooping, or lying down. When you make her get up, or help her, she is very unsteady on her legs. Perhaps she walks to the barn, but steps high with the fore legs, or walks in a circle. Or after walking a short distance, she lies down or falls down. Perhaps at first she lies with her head around by her side, but as she gets worse, she stretches out prone on the ground. She grinds her teeth, perhaps her head and ears twitch, and the legs may be kept constantly in motion.

Her rate of breathing increases rapidly and in two or three days she dies. Occasionally a ewe that lambs soon after the trouble begins will recover rapidly, but most of them die.

Some breeders believe that a mineral mixture containing Glauber Salts and enough common salt to induce the ewes to eat the mixture has some preventive value. But green grass, if available, and plenty of exercise ac-



Hampshire Ram, a real sire and show ram. First at Chicago, 1928. Bred and owned by Straloch Farm, Davis, California.

companied by light feeding, when grass is not available, are the best preventives.

No one has found anything of much benefit after ewes are unable to walk.

Lambing indications. The udder is generally quite distended and the teats fill with milk. You may notice a sagging away of the hip muscles, the parts are enlarged, and the ewe is restless, continually getting up and lying down. Some ewes attempt to claim the lambs belonging to other ewes.

In normal birth, the head and front legs of the lamb are first presented, with both feet forward under the lamb's chin. Leave the ewe alone if she is making reasonable progress. As a rule very few need any assistance.

Have a barley sack ready, break any enclosing membranes that may still be intact about the lamb's nose, wipe away the phlegm from the nostrils, and if it does not start to breathe at once, rub it vigorously with a barley sack. A normal, husky lamb should be on its feet, hunting for nourishment in fifteen or twenty minutes. Strip each teat two or three times to remove the wax that seals it at the end. If the lamb has not nursed within a half hour and is too weak to stand alone, back the ewe into a corner, hold her with your knee against her neck and shoulder, and lift the lamb up so that it can nurse. Sometimes it is necessary to squirt some milk into its moutn to get it started. Continue assisting the lamb to nurse until it is strong enough to go it alone.

Lambing difficulty. If the ewe has been straining for some time with no results, some assistance may be needed.

Examine her to see if the head, with the front feet under the chin, is presented, If so, steadily draw the lamb's legs in the direction of the udder, making lambing easier. Do not let the head turn back.

Yearling ewes, lambing for the first time, generally need the most help. If either or both feet, or the head are not forward, after coating your hand with vaseline, gently push the lamb back, get the front legs and head in proper position. Then birth should occur easily.

Occasionally the hind quarters are presented first. If only one lamb is present, it is sometimes possible to turn it around to a normal position. But you must be careful or you will do more harm than good. If it seems preferable to deliver the lamb hind legs first, try to accomplish this quickly or the lamb may smother. Take it by the hind legs and swing it rapidly in a circle. This may expel from its nostrils and throat the fluids often forced into it because of the reverse presentation.

If it is necessary to assist a ewe about to lamb twins, be sure not to get the two lambs confused. Pulling on one leg of each limb at the same time may lead to complications that will be fatal to both lambs and ewe.

If any internal tissues are torn during the attempt to render assistance to the ewe, she will probably die from blood poisoning.

Feeding and management after lambing. If lambing has occurred in December or January, some grass is often available in many parts of California.

Perhaps the ideal time to have ewes lamb would be just before grass was available, so that as it becomes stronger and more abundant, the ewe would increase her milk flow about as needed by the lamb. But of course rains are so variable that this cannot be done.

However, if you have good grass for the ewes and lambs after the latter

are a few days old, that is the place for them. If the weather is quite cold or rains are heavy, some shelter is beneficial.

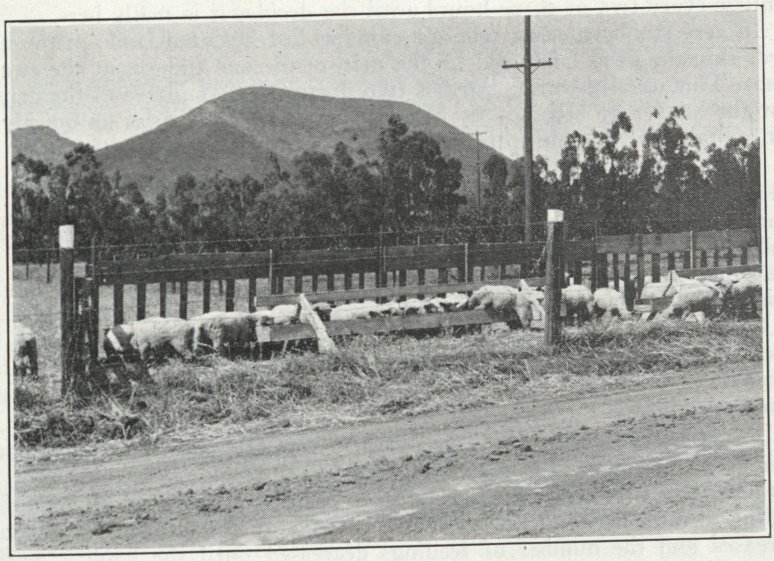
If grass is scarce, or if there is none, the ewes must be fed. Alfalfa hay, fed generously, after the ewe has recovered from the effects of lambing, and the lambs are nursing regularly, is all that is needed for most ewes on farms.

Perhaps a few old ewes may need a handful of grain each day until pasture is good. Oats, or a mixture of equal parts barley, oats and bran is fine. Cost may compel the use of various other feeds or combinations. If the young lambs must be kept around the sheds for some time, see to it that both pens and corrals are clean, and get the lambs out into the sunshine, if there is any.

Ewes, approaching lambing, will drink quite a lot of water, unless the weather is very cold, hence a generous supply of water in a clean trough or bucket should be available for each ewe all of the time. After lambing they will need plenty of salt. Put ground salt or a block in a box about one foot from the ground where each ewe can help herself at any time.

All of the ewes can run together after the lambs are several days old, although it is best to keep the twin lambs in a separate group to permit extra care and feeding if needed, and they should not be so crowded that the younger lambs are handicapped. If the lambs are dropped in December or January, and you wish to hurry them along for market or for show, you can build a creep and feed the lambs in it.

A "creep" is just a pen, into which the old ewes cannot go, but the lambs can. Most Future Farmer boys with just a few lambs feed a mixture of barley, two parts, oats one, and alfalfa meal one, Feed this in a trough inside the creep. Keep the trough clean and feed as much as the lambs will eat readily in two feedings each day.



TYPICAL CREEP FOR GRAIN-FEEDING LAMBS

But bear in mind that you need to get the greatest possible growth and fleshing from the mother's milk. It is not only the best, but usually the cheapest, and if the ewe is to milk well, pasture——good, green palatable pasture—is most valuable. If your lambs are to be dropped in December, perhaps you can irrigate a field of plain old foxtail for use in January and February. If not, can you fall-sow some barley, or oats or rye, so it will be available soon after Christmas?

For later pasture you may grow alfalfa or ladino clover, or sudan grass, but none of these will be of much use in December or January.

Young lamb trouble. Weak lambs, chilled lambs. In addition to the previous suggestions for handling weak lambs, further attention may be needed for the weak ones that become chilled.

Wrapping them in woolen cloths and placing them in a room by a stove or heater is usually sufficient in most parts of California. Hold them up to nurse every hour, or feed them a few teaspoonsful of milk until they can stand alone. Some advocate dipping the lamb in hot water, as warm as the elbow can bear; then remove, rub dry, and wrap them up in cloths for a couple of hours.

Triplets. Occasionally a ewe will drop three lambs at one time, or one side of the udder may not produce any milk, and that ewe may have twins. In either case, you have an extra lamb on your hands. If a good milking ewe lambs a single lamb about the same time it is often possible to give one of these triplets or twins to such a ewe.

The procedure is about the same as with a ewe that refuses to claim her own lamb. There are various practices to follow but perhaps the most universal procedure is to smear some of the ewe's milk on the lamb you want her to adopt and on her nose. Tie her with a halter, or put here in a stanchion. Some people drive a stake by each of her flanks to lessen her chances of kicking the lamb away, and to keep her from lying down. Assist the lamb to nurse every two or three hours until she decides it is really hers.

In very stubborn cases, where a ewe has lost her own lamb, many shepherds skin the dead lamb and tie the pelt on the one they want the ewe to adopt. This usually works, but has two drawbacks. It increases the danger that the lamb may become "fly blown" and if the pelt dries up quickly, is lost, or taken off too abruptly, the ewe may disown the lamb.

Orphan lambs. If a ewe dies, or there is no mother for one of the twins or triplets, a boy can get worthwhile experience if he raises the orphans by hand. Many sheep projects have been started with nothing but orphan lambs. Such lambs in a large flock are called "bummers" because they often learn to nurse any ewe in the bunch whenever there is an opportunity.

Some breeders raise the orphans on goats, but they can be hand fed successfully if reasonable care is given to a few details. A California State Fair Grand Champion wether, that answered to the name of "Skeezix" was raised on a bottle.

A new-born orphan should have about two tablespoonsful of fresh cow's milk every two hours for the first day or two. If he received none of his mother's milk,would give 1 teaspoonful of castor oil, one hour after the first feeding of milk. In the next few days the amount of milk can be gradually increased and the number of feedings decreased until the lamb is getting four feeds of one-half pint each of whole cow's milk. This is plenty for the

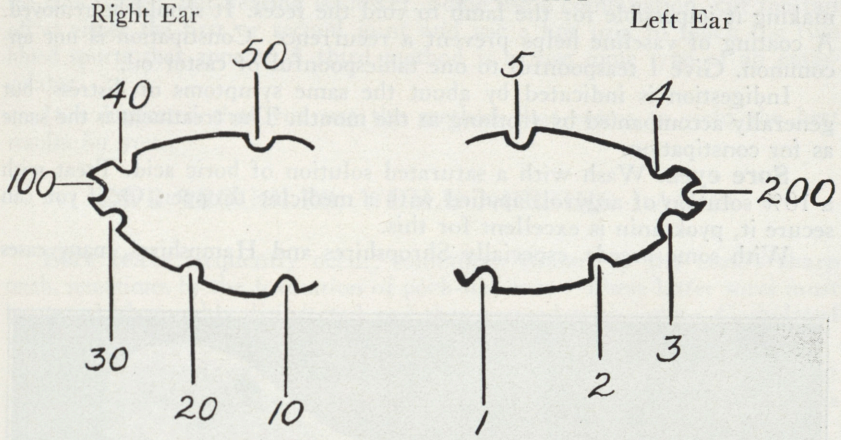
first three weeks. The milk should be fresh, warmed to blood temperature, and can be fed from any long-necked bottle. Swan-bill nipples can generally be secured at the drug store. All utensils must be kept clean.

By this time the orphan will be nibbling at the hay and will soon be ready to eat grain. Oats and bran, equal parts, are first choice.

The milk allowance should be gradually increased until he takes a pint at each feeding, the times reduced from four to three. This should take him up to two months of age. After that, a gradual increase to a quart twice a day should be ample. Wean at four and one-half to five months, the same as the others.

Ear notching. When the lambs are old enough to nurse readily, they should be ear notched. There are many systems, but for those who have not adopted any, the following is submitted.

EAR-NOTCHING CHART



This notching may be done with a harness punch, but a regular ear notcher is more satisfactory. To get Number 6, use four and two. To get Number 8, use five and three. A notch in the extreme point of the right ear is 100, in the extreme point of the left ear 200.

Purebred lambs should be given an ear tag before they are weaned, in addition to the ear notches.

Young lamb troubles. Various difficulties will be encountered with young lambs from time to time but only a few of them can be discussed here. Each discussion must be brief. For more complete descriptions see Bulletins.*

Navel ill. Contagion may appear whenever old sheds and corrals formerly occupied by sheep are used. The first thing is prevention. Clean and disinfect all quarters thoroughly, before lambing begins. The germ enters the body through the navel cord soon after birth. The lamb gets dumpy and loses its appetite. Stiffness later appears in the leg joints and they become enlarged. Severe diarrhea follows and usually a little later, the patient dies.

TREATMENT. Dip the navel cord of all new-born lambs in a solution of

*Farmers' Bulletin 1330, Parasites and Parasitic Diseases of Sheep, U. S. D. A. Farmers' Bulletin 1150, Diseases of Sheep, U. S. D. A. Circular 138, Prevention of Disease in Young Lambs, Montana Experiment Station, Bozeman, Mont.

tincture of iodine, immediately after lambing. Some shepherds use a mixture of glycerine 18 ounces, tincture of iodine 1 ounce, and carbolic acid 1 ounce.

White scours. This is another serious trouble that can be minimized or almost entirely prevented by cleaning and disinfecting, as previously described, before the ewes are brought in. Should it break out, separate the affected ones from the others, reclean and disinfect everything. Those badly infected might better be killed. Some recommend using ¼ ounce baking soda, 1 ounce sulphate of magnesia and a pinch of ginger in flaxseed gruel. Follow this in about four hours with 2 ounces of raw linseed oil.

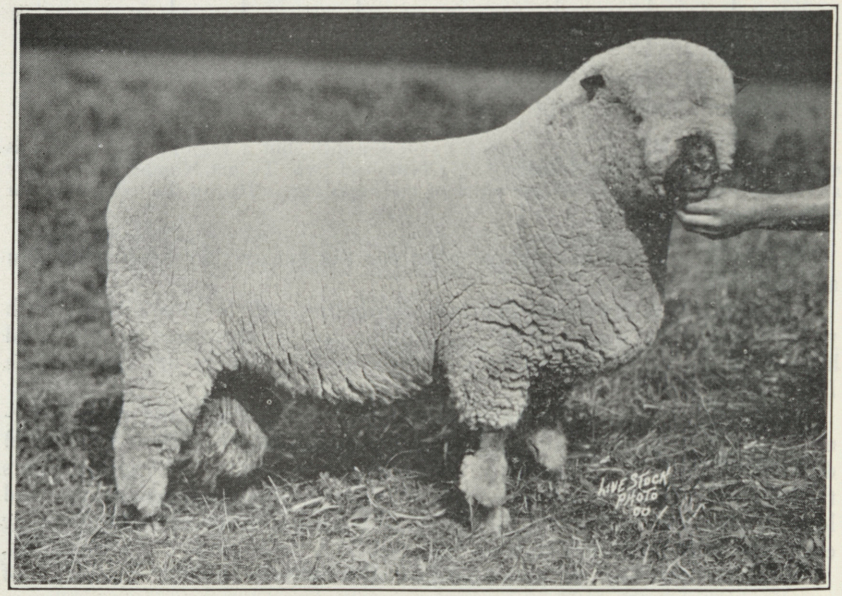
Diarrhea. Usually the result of too much milk. Reduce ewe's feed, or keep off of grass for a few days. Milk ewe or let another lamb nurse her. A tablespoonful of milk of magnesia should be given to the lamb. Some advocate giving a teaspoonful of castor oil first.

Constipation—Pinning. Pinning sometimes bothers lambs for the first week or ten days. The feces, quite gummy, collects beneath the tail, making it impossible for the lamb to void the feces. It should be removed. A coating of vaseline helps prevent a recurrence. Constipation is not uncommon. Give 1 teaspoonful to one tablespoonful of castor oil.

Indigestion is indicated by about the same symptoms of distress, but generally accompanied by frothing at the mouth. The treatment is the same as for constipation.

Sore eyes. Wash with a saturated solution of boric acid. Treat with a 10% solution of argyrol, applied with a medicine dropper. Or if you can secure it, pyoktanin is excellent for this.

With some breeds, especially Shropshires and Hampshires, many cases



Shropshire Ram. McKerrows—5479—621549. Champion at Illinois 1928, Wisconsin 1929, Michigan 1930. Bred and owned by George McKerrow and Sons, Pewaukee, Wisconsin.

of sore eyes are due to turned in eyelids. This may be corrected by cutting a notch out of the lids, or stitching them back with needle and thread. Some prefer to fasten them in place with adhesive tape.

Docking—Castrating. Can be done most satisfactorily when lambs are about two weeks old. Have an assistant hold the lamb, its head up, back against his breast. He holds the right front and hind leg with his right hand, the left ones with his left hand. Cut off the lower one-third of the scrotum. Push back the membranes covering the testicle, grasp the cord at the upper end of the testicle, and draw this out, together with the testicle. Remove the other one in the same manner. Disinfect the wound with sheep dip or apply iodine. If after a few days, pus develops in the wound, open it to permit drainage, and apply plenty of tincture of iodine, with a syringe.

Docking may be done at the same time. There are various methods. erhaps a butcher knife still finds the most use, although many California range outfits use a hot iron to burn them off. There is less bleeding when the iron is used, but healing is slower. Some use a combination, cut the tail off at either the first or second joint and use a hot iron to touch the two blood spurts that appear. A third method is to use some type of an emasculator.

It is suggested that you use the method that seems to yield the best results for you.

EWE TROUBLES, WHILE NURSING LAMBS

Sore teats frequently occur, sometimes caused by the lamb's sharp teeth, sometimes by the formation of pock-like sores. These latter sores must be opened, thoroughly disinfected and then treated with iodine. Carbolated vaseline will usually remedy the first trouble.

If the **ewe's udder** is swollen, and she seems to be in pain, milk her out and paint the swollen area with tincture of iodine each day, until it becomes normal.

Occasionally a **pus pocket** is found. Open it for drainage, and disinfect thoroughly each day. Sometimes the milk from infected udders is poisonous. If the lambs are especially valuable, it might pay to feed them by hand until the udder is normal.

Blue Bag (Mammitis) is causing serious losses in many sections of this state during each lambing season. Perhaps it begins as a caked udder, or garget. A severe bruise may be the starter, or the lamb may not take all of the milk, but there is considerable evidence that the most general cause is indigestion from some intestinal disorder. Anyhow it is very perplexing and costly. The ewe goes off feed, stands around by herself, walks little and is often lame. Examination of the udder shows that it is badly inflamed, severely swollen and the milk stringy.

In a few days the udder is extremely hard and produces no milk. One or both quarters turn almost black, or a deep, dark blue, hence the name. Usually the heaviest milking ewes are affected. As soon as trouble appears, put the ewe in a small, warm, dry stall. Bathe the udder with a hot Epsom salts solution (1 pound of salts to 1 gallon of water) and massage it gently but abundantly. This should be repeated four or five times a day, and after each treatment, strip the teats for some time, removing any milk that is

available. Apply that oldest of ointments, two parts lard and one of turpentine, thoroughly mixed together.

Some shepherds use lanolin, also used by dairymen, which can be secured at the drug store.

The ewe should be permitted some exercise if she starts to recover, but should be fed very lightly on hay, no grain. Perhaps a drench of Epsom salts administered to the ewe when the trougle first starts will help to hasten the recovery. Occasionally one side of the udder sloughs off. The lamb should be hand fed as soon as the trouble appears, and not permitted to nurse.

Wool maggots. Produced by a small black fly that lays its eggs in the wool wherever filth and manure accumulate. If the temperature is moderate, the eggs hatch in a few hours, the maggots burrow into the skin, and sometimes into the flesh. The wound has a very repulsive appearance.

Of course the sheep should be kept tagged so that there is little chance for the eggs to find a lodging place, but in actual practice this cannot be done. Ewe lambs that soil the wool on the inside of the thighs are very promising victims, A lamb so affected, is restless, jumps up and lies down rapidly, will attempt to gnaw the affected spot, and later may be found lying in some remote corner.

Treatment consists of clipping the wool from the affected area, and a little more, in order to be sure none is left uncovered. Scrape away as many maggots as you can with the back of the shears. Commercial chloroform may now be applied to kill the maggots, but it is somewhat expensive and inclined to burn the skin and flesh. A solution for treating this trouble, known as Pinetrol, is handled by the California Wool Growers association. Mr. Wing recommends that commercial benzol be applied first, to kill the maggots, and the Pinetrol applied immediately afterward. Some growers use a mixture of one pint pine tar, ½ pint gasoline, ¼ pint turpentine and two quarts crankcase oil.

Whenever sheep are on succulent pasture, the rear quarters should be tagged often, or at least whenever any manure accumulates. This is much less work than getting rid of the maggots.

There are some other troubles that may affect the flock but only three will be mentioned.

FOOT ROT—EXTERNAL PARASITES—INTERNAL PARASITES

Foot-rot is becoming much more prevalent in California than it was a few years ago. It is an infection caused by a specific organism.*

Symptoms: First a slight lameness is noted. If you catch the ewe, you will find that the foot is warm, later the lameness is severe, and if in both front feet, the ewe will often attempt to walk on her knees. The horn of the hoof is undermined and the foot deformed. You will learn to recognize it by the gray, cheesy, dead tissue and the foul odor. Wet, poorly drained ground helps to harbor and spread the disease. In such a place, it may live from one season to the next.

There are several treatments. Here is one. Trim away all of the affected

*Foot Rot in Sheep—Bull. 254, Montant Ext. Service, Bozeman, Montana. Foot Rot in Sheep—Howarth J. A. Veterinary Medicine 25 (5), 186-188-1930.

parts of the hoof, wash the feet clean, and stand the sheep in a saturated solution of copper sulphate for two or three minutes. Repeat the treatment in ten days. Professor Robert Miller recommends the foot-rot remedy—Tartar Emetic as prepared by Dr. Howarth of the University of California and sold by the California Wool Growers association.

Ticks and lice. These are the two common external parasites found in this state. Can be eliminated by dipping, using any standard coal tar, nicotine or arsenical dip, according to directions. After the ewes are sheared in the spring, lice and more especially ticks may move on to the lambs, so this is a good time to dip. For lice, repeat dipping in twelve or fourteen days and for ticks at about 21 days.

Foot or leg lice are often found on rams, mostly on those of the mutton type breeds, seldom on ewes. As the name indicates, they are generally found on the lower parts of the legs, up to the knees and hocks, sometimes higher. Treatment consists of standing the sheep in a 3% solution of coal tar dip up to their bellies for a couple of minutes at ten-day intervals until they are eradicated.

Internal parasites. Stomach worms, liver fluke, lung worm and tape worm, are the four found in California but not in all sections. Therefore, instead of using space to discuss each of these, several references are listed at the bottom of the page.* If you have reason to believe that any of them are found in your region, write for one or more of the suggested publications and read it carefully.

*Sheep Production in California—Circular 49, U. C., Berkeley, R. F. Miller. Liver Fluke and Stomach Worm in Sheep, U. C. Circular 17, 1928, Freebour, S. B. Parasites and Parasitic Disease of Sheep—U. S. Dept. Farmers' Bulletin 1330-1928, Hall, M. C.



Romney Ram. Brownell's Kind. Bred and owned by Brownell Ranch, Woodland, California.

Do not let this formidable list of troubles scare you. Knowing that they exist, if you learn to recognize most of them when they appear, or better, so manage your sheep that most of them never do appear, you will find sheep raising interesting and generally profitable—for those who know how.

GENERAL MANAGEMENT UNTIL WEANING TIME

If pasture is available, it is the most satisfactory and economical feed for ewes and lambs. If it is abundant and fresh, the writer believes ewe lambs intended for breeding make more satisfactory growth on good pasture alone than when they are fed grain in addition to the pasture. It is desirable to have more than one field, so that the sheep can be moved when the grass becomes soiled or deficient. Fresh, clean water should be available at all time for both lambs and ewes, and there should be blocks of salt in boxes before them all of the time. When the weather is definitely warm, say in April, the ewes should be sheared, and following that is a good time to dip all of the flock.

Most of the shearing in California is done by professional crews, and each year a larger percentage is done with machines. The important thing is not the method but the skill and care of the shearers. The sheep should be off feed for at least twelve hours previous to shearing time. A small pen with a floor that can be kept clean should be available for the shearer and another small pen adjacent to it for catching the sheep. Still another pen or room should be provided into which the fleeces can be thrown as soon as they are tied. The floor of this pen should be clean or covered with a canvas.

Shade, sufficient for all of the flock, should be available after the middle of March. If there are no trees, a shade should be built.

The lambs should be weaned at from 4 to 5 months of age. There are various practices, but if the ewes are separated from the lambs, placed in a dry lot, furnished plenty of fresh, clean drinking water and fed only a very small amount of hay, they will soon dry up and can then go back on pasture. It may be desirable to partly milk out some of the heavier-milking ewes, but some people insits that it is better to leave them alone.

One of the most vexing troubles occurring in California during the spring pasture season is eye and ear trouble caused by foxtail and other sharp grasses. Whenever this grass starts to dry up, trouble begins. The eyes should be watched daily, the ears examined perhaps once each week.

When a beard gets into a lamb's or a sheep's eye, it may travel around back of the eyeball, or may penetrate the surrounding tissues. A white scum forms over the eye and complete blindness may result. The lambs will cause the most trouble if they are woolly faced. You will soon learn to spot the ones that are having trouble and should catch them at once and remove the beard or beards from their eyes. A pair of blunt-pointed tweezers are needed for this. After removing the stickers, put a few drops of pyoktanin in the eye with a medicine dropper. Perhaps once each week, all of the sheep, but especially the lambs, should be driven to the barn. Catch each one, examine the ears, eyes, mouth and the grooves below the eyes. At the height of the season, you will find plenty of stickers to remove.

In the Sacramento and San Joaquin valleys it is the regular practice to shear lambs in June in order to get rid of these same stickers that have often completely filled the wool on the lower part of the body, penetrating to or into the skin and causing the lamb considerable irritation. Lambs intended

for showing in September should not be sheared. A very few do shear wethers.

HANDLING LAMBS INTENDED FOR THE SPRING SHOW

Since the base date for the San Francisco Show is December 1st, the sooner after that date that the lambs are dropped the easier it should be to get them ready to show. If the ewes are heavy milkers and grass is abundant, the lambs might get fat enough without additional grain, but can hardly be expected to do so.

In recent years there has been little if any December green grass and last year, 1933, there was very little more in January. It is probably best to plan to creep feed the lambs. They will be ready to eat a little grain any time after they are from 8 to 16 days old. So you should have a creep ready by that time.

Be sure the trough is not o high or wide that the lambs cannot readily reach it.

The ration you use will be influenced by the price of various feeds, The following one is fine if the prices are in proportion to the price of lambs:

Rolled barley two parts, oats one part, bran one part. During the last thirty days, add one part linseed meal. Unless the pasture is good, it may pay to feed the ewes some alfalfa hay to increase the milk flow.

About six weeks before show time, block each lamb once. Three weeks later, trim the feet, if necessary, and block a second time. The lambs may be weaned just before time to leave for the show.

Ram and ewe lambs that are to be fitted for the State Fair should not



Southdown Wether Lamb. Grand Champion, Chicago International. Bred and shown by University of California.

be dropped until January 1, or later. It is suggested that they need not be creep fed if the grass is good. They will perhaps be weaned by the middle or last of May, and the ones not to be fitted should be provided with fresh pasture. By July 1, ram lambs should be separated from the ewe lambs. Soon after June 1, those lambs going to the State Fair should be started on grain, and since in many parts of the state the days are then quite warm, they should be kept in the barn in the day time and turned on pasture at night. Out of the following feed list you will perhaps find the right combination for the various lambs at different times of the fitting period. Rolled or ground barley, oats, bran, linseed oil meal or cake, dried beet pulp, molasses, alfalfa hay, carrots, beets, alfalfa meal, green alfalfa, cabbage.

Since the lambs will vary enormously in condition, no one ration can be set down that will be satisfactory for all of them. But if you start the grain ration with perhaps 14% or 15% of protein and gradually widen it out to only 10%, if the lambs fail to fatten fast enough, you will not be far off.

A common mixture used, with variations, in California is: Barley 50 lbs., oats 25 lbs., bran 25 lbs., linseed oil cake 10%.

Start them with not more than ¼ lb. per day and increase the amount gradually for at least two weeks. Then feed as much of this mixture as the lambs will readily clean up morning and night. Some green alfalfa can be fed at noon. If the lambs are not taking on flesh fast enough, feed the roots after the grain. Carrots and beets should be chopped into small slices. Either of these are satisfactory for ewe lambs but beets should not be fed to rams or wethers for they sometimes cause urinary calculi.

Toward the end of the fitting period, if the gains are slow, some cane molasses may be sprinkled over the grain. Molasses is not only a good feed but it will often induce the lambs to eat more.

The feet should be examined occasionally and if the toes are long or the sides of the hoof are turned under, they should be trimmed.



EQUIPMENT FOR BLOCKING

Blocking. Mutton sheep should be blocked. Study the flocks of the various breeds that are exhibited at the fairs and learn what is the particular style for the breed in which you are most interested. For example, Hampshires are blocked flat on the back, with a rather pronounced edge. Shropshires more rounded, and Southdowns even more so. Most shepherds leave very little wool on wethers, especially on the back.

It is very difficult to describe the blocking process, but here is an attempt. Put the sheep in a stanchion, or tie it firmly with a halter. Have it stand on a level floor, or one very slightly higher at the front. Decide what are the particularly strong and weak points of the individual victim and block accordingly. The idea is not that you are going to fool someone, but that you want to present the animal in the most attractive manner. Overalls are correct for wear at home when working with sheep, but you would not wear them at your sister's dancing party. For the market wether, medium depth and width of body, a full hind quarter and smooth, compact appearance is the aim.

Almost no two shepherds follow the same routine. You may find one that suits you better than the one put down here. Remember this is just one sample.

Dampen the wool, using a fiber brush. If many burs and stickers are present, curry for awhile with a round spring curry comb, stroking with the wool. Re-dampen the fleece and rough it up with a wool card, the idea being to straighten out all of the fibers.

Now you are ready to use the shears. Hold them flat, at right angles to the backbone. Do the cutting with the forward blade, keeping the back one stationary, except for the advancement forward for a new cut. In this manner, flatten the back from shoulder to rump. Do not cut too deep at first, until you learn to do it smoothly.

Rough up the wool over the clipped area, and smooth it off again with the shears.

Repeat this until the back looks pretty good. Then trim off the sides in proportion to the back, being careful to make the sheep look like a sheep, not like a box. Don't take too much off of the belly. Round off the hind quarters and breast, smooth off the legs, and finally finish up the head and neck. This latter is the hardest, but try to give all of the lambs a uniform appearance about the head, if they are of the same breed.

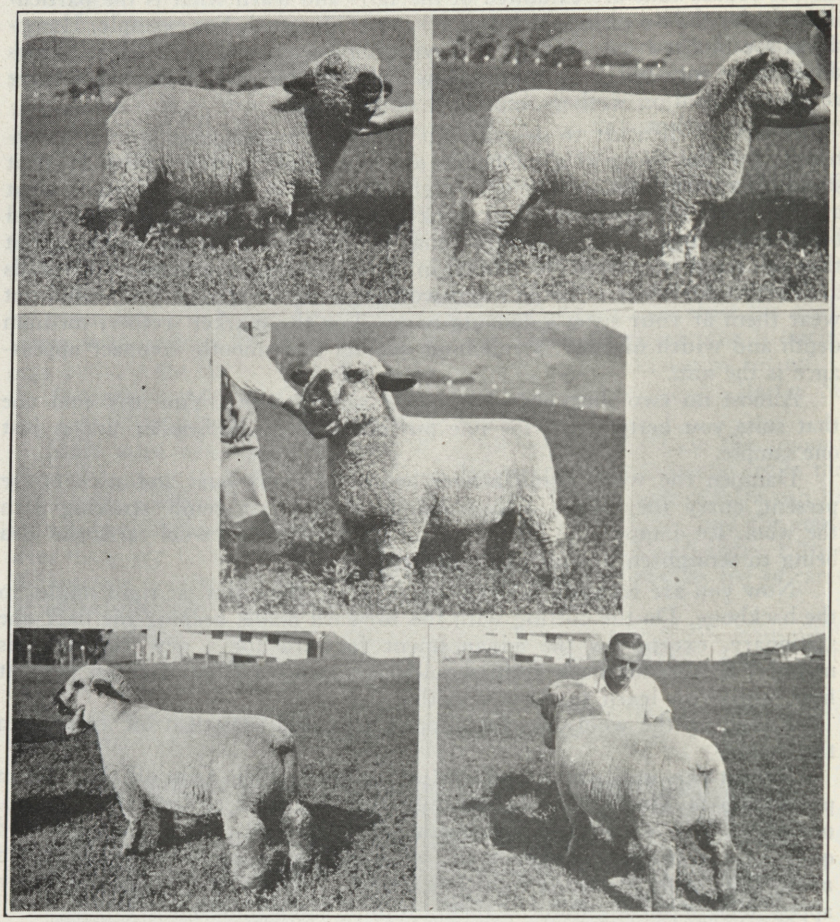
This constitutes the "once over." Decide whether or not you have cut too much or too little in some places, and in a few days repeat the process all over again. After you have become quite expert, perhaps three blockings before you go to the fair, and one freshening up after you arrive there, will be sufficient. The shears must be sharp and especially at the points. Do not grind the points off for blocking as hand shearers do.

Don't get the wool too wet. After you have learned what to do and how to do it, it's just a case of practice and then more practice after that.

About the worst thing you can do is to wash the sheep within a month of show time. This will remove all of the grease from the wool and cause it to look and feel like cotton.

If there is considerable dirt and some stickers in the fleece after the first blocking, secure a good woolen rag and scrub the sheep very vigorously with this, using very soapy water, but keep the rag squeezed out enough so that the soap and water do not penetrate very far toward the sheep's skin.

ILLUSTRATING STEPS IN BLOCKING



The upper left-hand picture shows the lamb before blocking. The upper right shows the same lamb after the first trimming. The center picture shows the lamb after the second time over. The lower left-hand picture shows the result of the third operation, and the lower right the completely blocked lamb.

If you have had very little experience along this line, practice on something not in the show string.

The ewe lambs not intended for showing should grow nicely without grain if a good variety of pasture is provided. Purebred ram lambs that are to be sold for breeding may benefit considerably if you feed from one-half to one pound of grain each day in addition to good pasture.

COOPERATIVE ASSOCIATIONS

A very considerable number of sheepmen are members of the California Wool Growers association. The headquarters are 595 Mission Street, San

Francisco, California. The secretary is W. P. Wing. This is purely a service organization. They do not buy or sell sheep or wool, but do handle supplies of special interest to sheep raisers. A weekly paper is issued containing valuable information for growers. The subscription price for F. F. A. members is 50 cents per year.

One of the outstanding activities of this association is the annual ram sale. It is held at the State Fair grounds, Sacramento, generally the latter part of May or the first week in June.

One thousand or more rams of the various breeds, common to this state, and a few ewes, are sold at auction. This event should be placed on your calendar.

At the same address is a cooperative wool marketing organization, a separate concern but sponsored by many of the same individuals. It is the California Wool Marketing Corporation. The manager is James Kershaw, 595 Mission Street, San Francisco.

They are members of the National Wool Marketing Corporation which in 1933 handled 25% of the nation's wool.

If you have not found a satisfactory method of marketing your wool, it is suggested that you correspond with the above mentioned concern.

HANDLING THE WOOL CLIP

If you have provided the shearer with a satisfactory place for shearing, you should also have on hand enough paper twine to tie each fleece. Then you should secure enough wool sacks to hold all of the fleeces. Unless you are an exceptional tramper, you will seldom get over 220 pounds of wool or 30 to 40 fleeces from mutton sheep, into one sack.

The fleece should be rolled up, after the tags have been thrown out, with the flesh side out and tied securely with paper twine. If you have no wool sacks on hand at shearing time, the wool should be stored in a clean place and covered with a canvas. If you have quite a little wool, a frame to hold the sack is desirable. Should you need one, your agricultural mechanics teacher can perhaps help you build it. If he has no plans, ask him to write to the California Polytechnic School, and specifications will be forwarded.

BREEDING SEASON

After the lambs are weaned you will generally have some pasture or stubble that will be desirable for the ewes until the approach of the next breeding season. If you hope to get lambs about December 1, the ram should be with the ewes not later than July 1, for the gestation period for sheep is 147 days or about five months. If possible put the ewes on green feed not later than June 15, the idea being to have them gaining rapidly in condition by July 1.

For many regions in California, sudan grass is excellent for this purpose. If some of the ewes are quite thin and do not start to gain rapidly, it might pay to feed them a litle grain, but good pasture is usually sufficient. This practice is called "flushing."

Does this pay? Year after year I have seen the following result, lot 1 on Sudan at breeding time and lot 5 on barley stubble with almost no green feed in it. The result next spring, lot 1, 150% to 165% of strong, vigorous,

live lambs dropped, lot 5, 90% to 100% live lambs, not so vigorous, many weak ones. Next year, lot 1 on stubble and lot 5 on Sudan, and the results just as expected, lot 5, 150% to 165% strong, husky lambs, lot 1 around 100% fair lambs, many weak ones.

If you do not know whether or not the ram is a sure breeder, catch him each morning and paint his brisket with green coloring, green ocre mixed in crankcase oil. He will then mark the ewes as bred. After 18 days change the color to red. If you find all the ewes that had green on them now being remarked with red, you perhaps need another ram.

In small fields on a farm, one ram can handle fifty ewes; in large bunches three rams for each 100 ewes is safer.

In central and southern California except along the coast, most breeders shear the ewes in the fall. Perhaps more are sheared in August than any other one month.

Systems of breeding. If you plan to start a sheep project or already have one in operation, the system of breeding should be given careful planning. Will the production of purebreds, of grades or of crossbreds seem to offer the best returns under your conditions? Perhaps we should first define these three.

An animal is considered to be a *purebred* when both of its parents are of the same breed, are registered or eligible to be registered by a recognized breed association. When two purebred animals of different breeds are mated, the resulting offspring is a *crossbred*. When a purebred animal and one of mixed breeding are mated, the resulting offspring is a *grade*. Much of the improvement in livestock is due to the use of and the influence of purebreds. Generation after generation of careful selection and aim toward a definite goal has eliminated many undesirable characters. As a result purebreds can be expected to produce offspring more uniform in all respects than those from animals of mixed breeding. Purebreds respond more readily to good feeding and care, but it is also well to remember that if the proper care and feeding are not provided, they can deteriorate very rapidly. Purebred breeding can and should represent the highest type of livestock improvement, but very few people have the personal atributes, the training, experience and often the means to succeed in this business. Some people get the notion that the multiplication of animals is breed improvement, but they are mistaken. A real purebred livestock breeder is one who makes each generation as good or a little better than the previous one. There is a notion very prevalent in California, that so long as an animal has purebred parents it is bound to be a good one. but unfortunately this is not always the case. Purebred breeders must always be on the alert, and sell for market consumption all animals that do not meet the breed's standards.

To be a successful purebred breeder, a person must not only know first how to produce the best market animals, but in addition to this, his location must be right and he must be a good salesman. Advertising is absolutely necessary and the establishment of a reputation for honesty and dependability is essential. Careful, accurate records must be kept, and the animals fully developed. All of this costs money, often times much more money than does the production of market animals.

It is important to keep in mind that only a relatively few are outstanding successes as purebred breeders and that most of these were first successful producers of market animals.

Most of the successful range and farm production in California is bound

to be based largely on grade flocks. In the sheep business the most promising field is certainly the production of early market lambs. For this a good, grade ewe, reasonably large, smooth, with a good fleece, is and will surely continue to be the base. Of course purebred rams will be used in increasing numbers.

The production of rams for use by range men is an attractive field, for while they should be purebred, and purebred registered rams should always be used as their sires, the registration of the ewes need not be maintained. This will reduce the cost, much of the record-keeping and many other items.

Another field that is very promising is the production of ewes for replacement in the flocks where market lambs are the product of direct crossbreeding, usually mutton rams on ewes of Rambouillet breeding. The lambs from such a cross are seldom suitable for retention in the flock as breeding ewes, especially as to their wool production. Many range men follow the commendable practice of marketing all of their crossbred lambs, and when additional ewes are needed, buying the type that seems to best suit their conditions.

Methods of breeding. There are three common breeding methods, inbreeding, linebreeding and outbreeding. You can find these described and discussed at length in many text books.* As a general proposition when you are dealing with a small number of sheep it is advisable to secure a new ram every two years to avoid inbreeding. The new ram might be bred along much the same lines as his predecessor, but the chance for selection of ewes in a small flock that would justify close breeding is too limited to mean anything.

*See "Producing Livestock," by Edwards, Carroll, Kammlade, Nevens and Snapp.

PUBLICATIONS RECOMMENDED FOR FURTHER STUDY

Bulletins and Circulars:

576 F. Breeds of Sheep for the Farm.

810 F. Equipment for Farm Sheep Raising.

840 F. Farm Sheep Raising for Beginners.

1051 F. Sheep on Irrigated Farms in the North West.

1199 F. Judging Sheep.

Cir. 49—Sheep Production in California. By Robert F. Miller, U. of C., Davis, Calif.

Bul. 473—Economic Aspects of the Sheep Industry. By E. C. Voorhies, U. C., Berkeley.

Bul. 200—The Use of Cottonseed Meal, Hulls, Molasses in Fattening Sheep. New Mexico Agricultural Experiment Station, State College, N. M.

Bul. 194—Fattening Range Lambs in Idaho. University of Idaho, Moscow, Idaho.

Bul. 238—Lamb Fattening Experiments in Utah. Utah Agricultural Experiment Station, Logan, Utah.

Cir. 81—Ladino Clover. University of California, Berkeley.

Bul. 253—Arthritis in Lambs.
Bul. 285—Foot Rot in Sheep.
Cir. 142—Intestinal Worms in Sheep
Cir. 138—Prevention of Disease in Young Lambs.
} Montana Experiment Station, Bozeman, Montana.

Bul. 261—Pregnancy Disease of Sheep. North Dakota Agricultural Experiment Station, Fargo, N. D.

Polyarthritis of Sheep. Dr. J. A. Howarth, University of California, Davis, Calif.

Books:

Sheep Management, Breeds and Judging—Kleinheinz.

Productive Sheep Husbandery—Coffey.

Range Sheep and Wool—Hultz and Hill.

Western Livestock Management—Potter.

Breeds of Livestock in America—Vaughan.

Types and Market Classes of Livestock—Vaughan.

Livestock Husbandry on Range and Pasture—Sampson.

Western Grazing Grounds—Barnes.

Dairy Department Supplement

1934 Bulletin, the California Polytechnic School San Luis Obispo, Calif.

DAIRY PRODUCTION

The dairy industry is the most important agricultural enterprise in the United States. Last year it returned approximately 25 per cent of the total gross income. It appears that it will continue to hold a position of prime importance in the farming business. It has been the usual history of nations that as they get older they turn more from grain farming to livestock raising and dairying in order to keep up the fertility of the soil. The dairy cow is one of our most efficient producers of human food. Dairying is a conservative business that has always offered much employment to the well-trained worker.

The dairy production course at the California Polytechnic school gives such training and information as will enable students to become good dairy farmers or to hold such related jobs as farm managers, herdsmen, field men, cow testers, etc. What dairy workers need to know and be able to do is given careful consideration in making up the contents of the course.

During this vacation two dairy students are employed at the Adohr Stock Farms where nearly 2000 cows are milked. Three other students are employed with leading commercial dairies of the state. Five students are handling the school dairy this summer. One student is doing cow testing work in San Luis Obispo county. Many of the other students returned to home farms.

FOUNDATION NECESSARY

Unless students have had a particularly thorough training in agricultural departments of schools or considerable practical experience on a farm or both, they are required to take about one year of general agriculture before starting to specialize in dairying. This is for the purpose of giving everyone a good opportunity to decide in what phase of agriculture he is most interested and perhaps best fitted. It is also for the purpose of giving a rather broad agricultural training. The trend seems to be more toward diversification on California farms.

The first year of the upper division of the course is spent in a thorough study of feeds and feeding and the factors that affect milk production. Training is also given in the selection and judging of dairy cattle. Laboratory work is

conducted at the school dairy and on the farm in order that everyone can learn how the skills are performed and be able to do them.

PROJECT OPERATION

Every student is encouraged to start some sort of a production project during this year. At the present time dairy students own over thirty registered dairy animals that are kept at the school dairy. About fifteen of these animals are now in milk and giving returns that help pay for the animals and school expenses. These milking projects are handled on a contract basis; the school receiving 20 per cent of the returns from the butterfat sales to pay the cost of keeping up the equipment and marketing the products. Some of the cows are paid for before the boys leave school and are taken home for foundations of herds. On the outstanding milk cow project of the past year one student who bought two registered Jersey heifers received a net income from them of $100. At the end of the school year he was offered a profit of $100 on the two heifers bringing his total earnings to $200. Some of the poorest projects barely broke even but they all gave splendid experience and training.

A few of the students are handling calf-raising projects. Several heifers have been raised that will soon be or are now in production. Several bulls have been raised and later exhibited at the State Fair and sold for herd sires. One student created quite a sensation at the last California State Fair when he won the junior championship with his Guernsey bull showing in competition with all the old breeders. He later sold this bull at a nice profit.

The second year of the upper division course in dairying is of course more advanced in every way. A study is made of animal breeding and physiology, herd management and record keeping and the handling and judging of dairy products. The entire school herd is used for practice work rather than the individual project.

Visits are made to leading dairy herds of the state in order to study the various breeding programs and methods of feeding and management.

The last year of the course may be spent on the home farm or some other commercial dairy but still under school supervision. Upon the statisfactory completion of this course a certificate of accomplishment is given in addition to the certificate of completion that is given at the end of the previous year. These certificates of accomplishment state the exact skills which the students can do well and when they are

signed by the superintendents or owners of the ranches in addition to school authorities they are valuable recommendations for jobs.

PLANT AND EQUIPMENT

The school farm of over 1400 acres and a high-class purebred herd of 100 Jerseys, Guernseys and Holsteins is splendid equipment with which to get training and experience in dairy production. At the present time the herd is averaging over 35 pounds of butterfat per cow per month. Over 60 per cent of them are first-calf heifers. It is estimated that the herd will average over 450 pounds of butterfat per cow for this year. About eight students milked the herd during the past school year for which they were paid an average of $15.00 per month. Wages are paid according to the amount of butterfat the cows produce which gives an added interest and incentive to good work. The herd is Federal-accredited for tuberculosis and has been pronounced free from contagious abortion by the state department of agriculture.

It is anticipated that there will soon be a revival in interest and demand for healthy, typey, high-producing purebred dairy catle. This herd is now supplying considerable foundation stock for projects throughout the state.

The dairy herd has an income of over $600.00 per month, a considerable percentage of which is paid to students for labor. The entire school is supplied with dairy products and the surplus sold to local creameries. Last year a price of forty cents per pound of butterfat was received.

A show herd has been taken to the California State Fair each year. Last year several first prizes and one junior championship were won. Such an activity is splendid experience and gives a good opportunity to become acquainted with leading dairymen and agricultural authorities.

RELATED SUBJECT MATTER

Only a part of the time of the dairy student is taken up with his major field. In addition, he has an opportunity to acquire all of the book-keeping and farm accounting practices necessary for a manager or foreman employed on a large-scale enterprise, or a man in the dairy industry for himself.

Another related course is that in agricultural mechanics. In this study, the student learns the operation and repair of all types of farm machinery typical of the dairy major in which he is enrolled. He learns to adjust and operate the common types of tractors, gas motors and electric motors. He learns farm carpentry and black-smithing, including horse-

shoeing. He learns forge work and the common welding operations necessary; leather and sheet-metal work of a type which can be put to use on the average dairy enterprise.

Another field of related subject matter includes retail marketing, under which is grouped business letter writing, advertising and retail selling. This course is developed from the standpoint of the practical dairyman or plant manager.

The growing of crops necessary in the production of dairy animals is taken up within the major courses. However, additional agricultural science is given to provide a thorough foundation of understanding in soil management, disease control, irrigation practices, necessary bacteriology and genetics and similar fields. Other subject matter includes political science, physical education and English. Music is optional.

DAIRY MANUFACTURING

The same course in general agriculture is required for dairy manufacturing students as for those specializing in dairy production. It is considered essential to get somewhat of a broad knowledge of agriculture and take the related work.

The first year of the upper division course in dairy manufacturing is identical with that for the production section. Successful creamery workers need to be familiar with dairy cattle and have a thorough knowledge as to how good dairy products are produced.

The second year of the upper division course in dairy manufacturing starts with a classroom and laboratory study of dairy bacteriology and the manufacture of butter, cheese and ice-cream and the handling of market milk. During the spring semester a considerable percentage of time is spent in the local plants of the Golden State and Challenge companies getting actual factory experience in the manufacturing and handling of products. Upon the satisfactory completion of this year, an effort is made to place students with manufacturing or retailing concerns. Among the students who completed the work this year in manufacturing one is employed at the Golden State plant at Santa Barbara.

The related work that is given with dairy manufacturing is identical with that given for the other agricultural courses. It is discussed in detail under the dairy production course.

This course outline is intended to give a general picture of the facilities and studies in this branch of agriculture. Any specific questions will be promptly answered. Address your communications to the Dairy Department, California Polytechnic School, San Luis Obispo, Calif.

Horticultural Department Supplement

1934 Bulletin, the California Polytechnic School San Luis Obispo, Calif.

In the horticulture department the student has a choice of three courses, Deciduous Fruits, Truck Crops, and Landscape Gardening. The work in each course is given in such a manner that the student may fit himself for either production in his own enterprise or as a manager. The courses, however, are not for the development of managers, but rather for the development of producers.

In each course the student is expected to carry on a project. This may be either a productive or non-productive project.

Each course takes up quite an extensive study of soils, plant physiology, plant propagation; insect, fungus and bacterial pests of plants and their controls; fertilizers and their application; plant nomenclature; optimum growing conditions for plants; climatic and geographic situations and other details kindred to plant production. Each of these subjects will be taken up in relation to the course the student is taking.

LABORATORY FACILITIES

The class schedules are arranged so that most of the classroom work is in the morning and the laboratory work is in the afternoon. Almost all of the laboratory work is done out of doors, the even climate of San Luis Obispo making this possible. The whole campus and farm are used as a laboratory.

No one text book is used in any of the courses. The library provides a number of up-to-date reference books and all class work is taken from these. The department also subscribes to numerous weekly and monthly publications dealing with the various subjects.

The climate and soil types are ideal for laboratory study in horticulture. The climate is cool enough to grow the most particular vegetables and yet warm enough to grow the tropical fruits. During the last two years only three frosts have been recorded on the trial grounds with the freezing temperature only lasting for a few hours. With this temperature condition existing it is possible for students to plant almost every day in the year. The highest temperature seldom gets above ninety degrees during the summer, making it possible to grow the most delicately-colored flowers or the most tender plants without danger of sunburn.

COURSE SUBJECT MATTER

In addition to the necessary background studies there are certain phases in each subject upon which particular stress is laid. In Deciduous Fruits some of these subjects are climatic conditions governing the production of the various fruits grown in California, the use of cover crops, their types and methods of growing, pruning types and methods, production and methods of handling green and dried fruits; market conditions, and variety studies.

In Landscape Gardening the phases that are particularly stressed are theory of design, landscape and architectural styles, landscape effect and composition, planting design; buildings and topography in relation to design; making of lawns; planting, pruning and care of trees and shrubs; extensive study of plant nomenclature, propagation of annual and perennial plants and general maintenance practices.

All students in the horticulture division are given a thorough course in nursery management as part of their regular work. This nursery practice takes in all the common nursery work and terms. The student learns to carry seeds from the time they are planted until they are set out in the open ground ready to bloom. He is expected to make cuttings of shrubs, trees and vines and do general propagation work as is carried on in the large nurseries. He is able to plant seeds in the glass house or open ground and is expected to care for them. He does all the spotting and potting that is done in our own nursery. He is expected to do budding and grafting.

RELATED SUBJECT MATTER

In the related subjects one that is of great importance to the horticulture student is Farm Mechanics. In this study the student learns the operation and repair of all the farm machinery necessary to carry on horticultural enterprises. He learns to adjust and operate the common types of tractors, gas motors and electric motors. He learns farm carpentry and blacksmithing, including horse-shoeing. He learns forge work and welding, both by forge and with acetylene. He learns leather and sheet-metal work of a type that can be put to use on the average farm. He learns to handle horses and horse-drawn tools as well as tractors and tractor-drawn tools. He learns to handle operations from planting to harvest.

Only a part of the time of the horticulture student is taken up with his major field. In addition he has an opportunity to acquire all of the book-keeping and farm accounting practices necessary for a manager or foreman employed on a large scale enterprise ,or in business for himself.

Another field of related subject matter includes retail marketing, under which is grouped business letter writing, advertising and retail selling. This course is developed from the standpoint of the owner and manager of an enterprise. Public speaking also comes under this heading and the student may take this form of work and thus aid himself in becoming a community leader. Other subject matter includes political science, physical education, and English. Music is optional.

The department is well equipped for work in horticulture. This year twelve acres of deciduous fruit trees are to be set out. At present there are five acres of apricots and with the new planting, will make a good-sized orchard. The trees to be set out are apricots, apples, peaches, plums, pears and almonds. This climate is well suited for the growing of these types of deciduous fruits. Students in this course will have an excellent opportunity to start from the bottom and work up. Within thirty miles of the Polytechnic school is one of the best almond-producting sections in the United States. Close by also, is a large green apricot-shipping district, while at Atascadero, fifteen miles away, is a large pear-shipping area. These tracts are frequently visited.

There are fifteen acres set aside for the growing of truck crops, with many more available. All are irrigated. Three acres are under overhead irrigation system, thus giving students a wide variety of irrigation types.

The district around the Polytechnic school is particularly adapted to the growing of winter vegetables, making many profitable projects for students who do not wish to stay for summer crops. This area is particularly noted for its winter lettuce, cauliflower, broccoli and Brussels sprouts; its spring peas and late shipping tomatoes. Truck crops students this past year successfully raised, for commercial production, tomatoes, beets, carrots, peas and cabbage.

The Landscape Gardening course has a five-year plan as a guide in redesigning the campus. No better training could be obtained anywhere to study all phases of landscape work. This past year a major start was made in re-designing the dormitory area, and now that the work is under way the future classes must continue the work. There are eighty-five acres in the immediate campus, enough to work on for years to come. The climate is ideal for this type of work as plants may be set out every month in the year.

The campus contains about two thousand exotics, with more being added each year, so there is ample opportunity for the study of plant material. The boys in the landscape course have complete charge of the maintenance of the campus. No

head gardener is hired. Each year three second-year students in this course are picked out to act as head gardeners and these boys have new students under them as assistants. This training is invaluable for work as head gardeners for large estates.

In connection with the three courses is a complete nursery. The plant includes two 20x60 glass houses and two 30x60 lath houses. All the early flowering plants and vegetables are started in the glass houses. Each student is trained in the care of the glass houses. This includes watering, ventilating, heat and moisture regulation. Each student is likewise expected to take care of the plants in the nursery. This past year the school nursery turned out more than 75,000 annual plants and grew over 20,000 shrubs. The majority of these plants are used on the campus. A large and well-equipped propagation house is included in the equipment. Here students may do spotting and potting and various nursery practices, as well as work during wet weather.

DEPARTMENT ACTIVITIES

The horticulture department engages in many outside activities. The Horticulture club, formed of the students in the department, have devoted themselves to both pleasure and community service. Among the outside activities that have been accomplished are the designing and planting of a garden at the old San Luis Obispo Mission, the care of the shrubbery around the General Hospital, the laying out of plans for the landscaping of the county detention home "Sunny Acres," the supplying of flowering plants for the county courthouse, and budding and grafting and hand-pollinating of fruit trees throughout the town.

The club has organized basketball and baseball teams that have been highly successful in competition with teams from the other departments. In addition to this the club has held many barbecues and picnics throughout the year.

OPPORTUNITIES FOR GRADUATES

The outlook for students graduating in these courses is very bright. At present all graduates are employed, either by large commercial concerns or working for themselves. There are few well-trained men in any of these fields, consequently there is a steady demand for them.

The object of this supplement is to give you a general picture of the work in the horticulture department. Specific questions will be answered in detail. Communicate with the Horticulture Department, California Polytechnic School, San Luis Obispo, Calif.

Electrical Industries Department Supplement

1934 Bulletin, the California Polytechnic School San Luis Obispo, Calif.

OPPORTUNITIES

The electrical industries are demanding young men who have been well trained in the fundamental principles of electrical engineering and who have acquired considerable skill and workmanship in the use of tools and instruments connected with electrical work. They demand men who have been trained to interpret and think in terms of new situations, men who have been taught to analyze and solve problems, not abstract text book problems, but practical problems being met in industry every day. The electrical industries are advancing very rapidly and men are needed who will keep up with the new technical advancement, and recognize opportunities for making applications of these new advancements in a way which will bring about profits to the employer.

The electrical department at the California Polytechnic school offers the student the opportunity to get the necessary technical and practical training that he may advance into a responsible position in his chosen industry. It is the objective of this department to give men the necessary training that they can advance into that gap in the electrical industries between the journeyman worker and the college graduate engineer.

COURSES OFFERED

The following subjects are offered in the electrical department listed with the approximate number of hours required by the average student to complete. The instruction is largely individual. The average student who has completed high school before entering this course will complete it in two years and have an opportunity to specialize in at least one branch of the electrical industries. The student who has not completed high school or who has not had the necessary science or mathematics may require more than two years in order to complete the course as outlined here.

COURSE

	Hours
Electrical class: Theory of direct currents and direct current machinery	180
Electrical class: Theory of alternating currents and alternating current machinery	180
Electrical class: Electrical Safety Orders	40
Electrical class: National Electric Code	40
Electrical class: Rules for Overhead Transmission Construction	40
Electrical experience: Electrical measurements and testing	400
Electrical experience, specialized: Service, installation and repair of equipment, and specialized training	600
Power plant operating class: Including steam, gas and Diesel engines	100
Power plant operating experience: Operating Diesel-electric generating plant	60
Industrial relations class: Problems for the young worker	90
Electrical drafting and design	200
Physical education	200
Elective	370

ELECTIVE SUBJECTS

English	180
Science	250
Mathematics	180
Practical machine shop work	100
Welding, gas or electric	100

The above elective courses are for those students who have not had a good foundation in this work. A student may choose from this elective group or the counselor may recommend that certain of these elective courses be taken. For instance, if a student appears to be weak in English, or mathematics, his counselor will recommend that he take a quarter or a semester of this work.

DESCRIPTION OF COURSES

Electrical class: theory of direct currents and direct current machinery. This class meets five days a week for one hour and takes up the elementary study of electricity and magnetism, electrical circuits, and direct current machinery. A standard text book, used in many of the colleges, is used in this class, supplemented by mimeographed notes by the instructor and problem sets.

Electrical class: theory of alternating currents and alternating current machinery is a continuation of the above course on direct currents, and uses a standard text book and mimeographed notes with problem sets. This class meets five days a week for the second-year electrical students and covers all of the fundamentals of alternating currents and alternating current machinery. On completion of this course, the student is thoroughly familiar with the fundamentals and operating characteristics of induction motors, synchronous motors, transformers, voltage regulators, relays, alternating current distribution systems, the effects of inductance and capacity in alternating current circuits, etc.

The electrical class dealing with the Electrical Safety Orders, National Electric Code, and Rules for Overhead Transmission Construction take up the study of these booklets so that the student on completion of his course will be familiar with standard practice in California in construction and safety as it applies to the electrical industries.

Electrical experience in electrical measurements and general electrical testing is given the first-year students in a well equipped electrical shop and laboratory. This shop is equipped with a miniature sub-station and an electrical power generating plant, a complete twelve-panel switchboard patterned after a commercial sub-station switchboard. In this sub-station a student may obtain a wide variety of operating experiences. There are also various types of electrical motors, generators, and transformers for testing purposes. The students run the characteristic tests on these machines, plot the curves, and in general, by experimental means, determine the characteristics of these machines. The instrument room is well equipped with both alternating and direct current testing instruments so that the student has the opportunity to become thoroughly familiar with the use of the electrical testing instruments used in industry.

Electrical experience is offered to the second year students in the form of construction of special equipment, design and building of small transformers, the service of the electrical equipment on the campus which includes over 400 H. P. in connected motors, repair of motors and transformers, and the installation of any new electri-

cal equipment or wiring as it is required on the campus. There is a well-equipped motor and transformer repair department provided in the electrical shop, as well as the usual machine tools such as lathe, drill press, grinders, etc. In this course the student becomes familiar with the use of commercial catalogs, making up an estimate for a job, and ordering the materials, the cost accounting of completed jobs, and the checking of materials in and out of the stock room.

The power plant operating class meets three hours a week during the student's last year and takes up the fundamentals of steam boilers, steam engines, the operation of steam power plants, the theory of steam cycles and the use of steam tables. In addition to steam work offered in this class, about fourteen weeks are given over to the study of the theory of the internal combustion engine, with special emphasis on the Diesel engine. Under the head of Diesel engines considerable time is given to a study of the mechanical features of various types of commercial Diesel engines with their operating characteristics. A study is also made of the relative costs of power, whether purchased from the power company, generated by the isolated Diesel plant, or generated by the steam plant in which the exhaust steam is used for process work.

Power plant operating experience is given in the school's power generating plant to all of the students taking the power plant operating class. This plant consists of a 120 H. P. Diesel engine directly connected to an alternating current generator, a 50 H. P. gas engine belted to a generator, and a 75 H. P. steam-electric generating unit. The students in this class take their turn operating this plant from eight in the morning until four in the afternoon. In this way the students put in about one day out of every fifteen operating the plant. This plant also furnishes an opportunity for two students to earn their expenses in school by operating from five until eight in the morning, and then from four in the afternoon until eleven at night.

The industrial relations class takes up problems about which the young man entering the industrial work should have some knowledge. These problems will cover such topics as the labor union, the present economic situation, personal budgets, the economics of insurance, industrial accidents, the elements of economics, etc.

Electrical drafting and design include the fundamentals of mechanical drawing, more complicated wiring diagrams, and some elementary problems in the design of special equipment such as relays, special transformers, etc.

Under the head of physical education the student may go out for the standard sports such as football, basketball, track, baseball, etc., or he may obtain corrective physical exercises in the gymnasium. In connection with physical education, one hour a week is given over to lectures in hygiene.

The English course is designed to give the student a better reading, writing, and speaking use of the English language. The science course parallels somewhat the work offered in a high school course in physics, but throughout the whole course the student's objective in electrical work is kept in view, and the course organized accordingly. A mathematics course is offered to those students who have not had high school mathematics, including trigonometry. The objective of this course is to give the student the necessary mathematics to carry on his electrical work.

Practical machine shop work is offered in a well-equipped machine shop that will accommodate about twenty students at one

time on the machine tools. This shop is equipped with sixteen lathes, ranging in size from a small bench lathe to a lathe that will swing twenty-eight inches, three shapers, two milling machines, three drill presses, one planer, and an automatic tool grinder. The student has an opportunity to obtain a variety of machine shop experiences in this shop. The welding department is equipped to handle about twenty-students at one time in general acetylene or electric welding.

OPPORTUNITIES TO SPECIALIZE

The electrical department has equipment and instructors especially qualified to give specialized training in the following main branches of electrical work: Armature winding and electrical machinery repair; automatic industrial control equipment; maintenance of electrical equipment in industrial plants; power plant and sub-station operation; communications work; work with the public service corporations; inside wiring and general contracting.

Since much of the instruction in the electric department is individual and both of the instructors have had wide practical experience, a student may specialize in almost any of the various electrical industries. In addition to the well-equipped laboratory there is an excellent library of technical books, to assist the student who wishes to take up special work.

ENTRANCE REQUIREMENTS

It is recommended that a student complete the usual high school course before entering the electrical industries department of the California Polytechnic school. However, any student who has completed two years of high school work or who is over seventeen years of age, may take up this work provided he has the aptitude and ability to profit by the instruction. Under the present industrial conditions, it is found to be much easier to place the young man after he is twenty years of age than before. Also it takes a more mature mind to grasp the type of electrical work offered in this course. For these reasons it is recommended that the student complete his high school training before entering the electrical department of this school.

PLACEMENT

On completion of his formal training in this school every effort is made to place the student immediately in the type of work for which he has been trained. The school provides a coordinator who spends part of his time making industrial contacts which have a twofold purpose. First, the coordinator brings back from the industrial world information which will be of value to the electrical instructors in training the students to fit into the industrial situation, and second, the coordinator through these industrial contacts is able to help the student get located in the type of job for which he is trained. The past record of placement of students from this department has been very satisfactory, and even under the present industrial stress many of the electrical students have been placed during the last year. It is the object of the training in the electrical department to prepare the student to enter industry. When he has reached that stage of training that he is qualified to hold down a job, he is placed as soon as a job can be found for him.

Poultry Department Supplement

1934 Bulletin, the California Polytechnic School San Luis Obispo, Calif.

The Poultry courses at the California Polytechnic school offer two major fields of training, one in Commercial Poultry and Egg Production, and one in Hatchery Management. The course in Commercial Production fits the young man to go into the poultry business for himself on his own ranch or qualifies him to secure a position on one of the leading ranches of the state. It offers him both technical knowledge and practical experience in the many commercial problems of the industry. Those who wish to start a hatchery in connection with their commercial plant or breeding farm will find that the work offered in Hatchery Management will give them the proper experience and training.

The Poultry course is so arranged that the student spends approximately one-third of his time on poultry subjects and two-thirds on related subjects such as Farm Business Management and Agricultural Mechanics. In Agricultural Mechanics, for instance, you will be repairing poultry equipment, building feeders, nests, fences, etc.

WHAT THE POULTRY COURSE INCLUDES

The class schedules at the Polytehcnic are so arranged that most of the classroom work is in the morning and the laboratory and project work in the afternoon. The class work includes all problems that the poultryman is confronted with in the operation of a successful plant. No one text book is used but the students are encouraged to buy one or more of the standard general poultry books. The school library has most of the modern and leading books on all phases of poultry husbandry. The students are encouraged to assemble quite a complete bulletin library of their own on all phases of poultry work. All of the leading poultry magazines come to the school library each month which are very valuable in class work to keep the student informed on all modern trends of the industry.

The class work includes such subjects as feeding chicks, feeding growing stock, and various rations for laying hens. The student is taught how to balance a poultry ration in the most economical way to secure the most profitable results. He spends considerable time on the study of the various poultry feeds and how to use them to the best advantage considering their feed quality in relation to price. The student studies the various types of poultry houses and their advantages for

various climatic conditions, localities, and comparative costs of construction. Discussion of types of roosting, watering systems, nests and feeders make it possible for him to choose his equipment wisely.

The class study includes the diagnosis, prevention, cure and control of all of the many common poultry diseases and parasites. This subject is considered from the sanitation, disease resistance, feeding and management factors. The course offers work in brooding in which you compare the brooding of chicks in battery brooders, floor brooding in confinement, and floor brooding with yards. A comparison of brooding with various types of brooders such as gas, electric and hot water, and the conditions under which they should be used, is made. The course will include a study of record keeping and an analysis of various costs of production.

The classroom work includes the selection of a breed of poultry and for which uses it is best adapted. It includes a study of the anatomy, physiology and various parts of the fowl. You will become familiar with the digestive, reproductive, circulatory, and respiratory systems of the fowl. The course includes many other problems of management of a commercial poultry plant.

The entire poultry plant of about 3000 birds is operated by the students affording them an ideal opportunity for commercial experience and project practice work. Occasionally project work is done during laboratory periods but usually the laboratory periods are devoted to practice work in grading and candling eggs, post-mortem work pullorum blood-testing, or dressing poultry for market. Other laboratory enterprises are judging, culling and grading a flock; vaccinating, caponizing, mating up a breeding pen and other phases that are required in a well managed poultry plant.

HOW THE PLANT IS EQUIPPED

The school plant is a commercial sized unit of 2000 to 3000 layers and facilities to brood 4000 to 5000 chicks. It is operated as a commercial plant and each student who has complete responsibility of a unit as a project is a definite part of the entire plant. This gives the student an opportunity to familiarize himself with the operation of the whole plant and to be a part of it instead of having small, entirely independent projects. The plant is exceptionally well equipped for instruction since most units are equipped with different feeding, watering and nesting devices. It is arranged this way so that you have an opportunity to determine for yourself which type you prefer after using each. Some laying hens are kept on open range, others in a house with a dirt

yard, others in a house with a concrete yard. Then there are birds which are continually kept in confinement as well as one house of individual laying cages. This affords you an opportunity to compare various types of management.

The school plant has nine brooder houses 16x18 feet. They are all equipped for either gas or electric brooding and have water piped to each room. Some of these houses have wire sun porches, others are used without any yard. The brooding equipment consists of a variety of both commercial and shop made feeding and watering devices. There are also several makes and sizes of gas and electric brooders. The plant also has incubating equipment to hatch its own chicks.

The projects are of commercial size and productive. In most cases the laying hen projects consist of one unit of 200 or more birds. The student takes over the entire responsibility and care of this project under supervision and keeps accurate records of all transactions. In most cases, the birds are owned by the school project fund (a revolving fund to finance all projects) and are loaned or rented by the students on a share basis. During the last two years the students have made a labor income from laying hen projects of $10 to $15 per month, but of course this varies according to the productivity of the pen and the market conditions. Besides the commercial egg production projects, there are pen breeding, and trapnest pullet projects. In the case of brooding projects the student buys the chicks and feed and other items from an approved source and raises the pullets or meat birds. The project is financed through the project fund and the account is settled at the close of the project. When the student finishes his course he may make arrangements to take his pullets from the well-bred school stock home with him. Other available projects are in meat bird producing, fattening birds, and incubating.

The products of the poultry projects are cooperatively sold to the school cafeteria or faculty; as hatching eggs, and in other available markets. The school plant is developing a very worthwhile strain of Leghorn birds through the projects and in this way is serving a definite need in the industry in California. Students are carrying on a very extensive program of pedigree breeding in an effort to develop birds with high production of large eggs of good quality. Emphasis is placed on high family performance instead of individual records. Only those families that show a low pullet mortality are used as breeders. This should develop in a few years a very desirable laying strain of birds for students to take home with them. Last year, more than 2200 individually pedigreed chicks were produced. To carry on this program it is neces-

sary that no stock is brought into the plant from outside sources making it impossible for students to bring in birds.

In addition to the labor income possible from projects, there is occasionally a little work available at the plant after school and on Saturdays. This work is seasonal and very irregular and cannot be depended on as a source of income.

YOUR OCCUPATION AFTER GRADUATION

After satisfactory completion of two years of work in poultry, the student will receive a Certificate of Completion. Those students who have had sufficient experience and have shown superior ability will receive in addition a Certificate of Accomplishment or recommendation in either Laying Flock Management, Brooding, Growing Young Stock, or Marketing Poultry Products. Some students of course may receive a Certificate in more than one phase of the work. Those students who wish advanced training may spend another year and earn a Certificate in Poultry Breeding, Poultry Plant Management or Hatchery Management. Some of the advanced work will consist of supervised practice work on commercial poultry plants.

Several of the students who have finished the poultry course at the California Polytechnic school have gone in business for themselves and now own and manage a profitable business. Others have secured positions in leading poultry plants or breeding farms. We are constantly in contact with leading poultry ranches and make every effort to secure positions for those graduating students who show outstanding ability.

EXTRA CURRICULAR ACTIVITIES

In addition to the Future Farmer chapter activities in which all students are participants, the poultry students have other interesting and worthwhile activities. The Poultry Club, which includes all poultry students, meets once a month. Its purpose is to bring in outside speakers, discuss poultry problems and discuss new research findings. The club also has such functions as increasing the demand for poultry products and improving market conditions. Frequently the students take part in and give talks at Poultry Association meetings and Farm Center meetings. The club also conducts a poultry and egg show during the Poly Royal.

This course outline is designed to give a general picture of the facilities and studies in this branch of agriculture. Any specific questions will be promptly answered. Address your communication to the Poultry Department, California Polytechnic school, San Luis Obispo, Calif.

Meat Animals Department Supplement

1934 Bulletin, the California Polytechnic School San Luis Obispo, Calif.

The courses in the Meat Animals department at the California Polytechnic school are designed to meet the needs of young men who desire training in livestock management, either for general ranch or commercial production of beef cattle, sheep or swine; purebred herd management, or to enter the commercial livestock field.

In general, the courses cover the study of types, breeds and market classes of livestock; feeds and feeding, care and management of feed-lot and purebred herds, pedigree and herd record books, range management, fitting and showing of fat stock and breeding animals, and general livestock practices.

There are three major fields within the department, being the production, management and marketing of beef cattle, sheep and swine. You may select any one, or all three of these, for your upper-division work.

PLANT AND EQUIPMENT

The Polytechnic school ranch provides the pasture and range facilities for the laboratory work in the Meat Animals department. This consists of 1400 acres of land, four hundred acres under cultivation, eighty-five acres in the campus and the rest in range land. The laboratory facilities are provided through the herds and the buildings and equipment.

In the foundation beef cattle herd owned by the school are sixty purebred Herefords and twenty-five purebred Shorthorns including some of the finest breeding in the state. The beef cattle equipment consists of livestock barns, feeding sheds, corrals, pastures and all the equipment found on a modern livestock ranch.

In the foundation swine herd are two major breeds of hogs, Duroc Jerseys and Poland Chinas. The present breeding herd numbers forty sows. Facilities include a central farrowing house unit, twelve feeder units with a capacity of two hundred and forty pigs, and twelve new double-unit movable farrowing houses set aside for breeding projects.

The sheed herd consists of three breeds, Rambouillets, Hampshires and Southdowns in sufficient numbers to provide adequate practice for students desiring to major in sheep production and management.

Each student majoring in one of the fields of beef, sheep or swine husbandry is required to perform and become skilled in all the jobs necessary in the care and management of the herd or flock.

PROJECT OPERATION

Each upper-division student is required to carry a project in the major field which he selects. He may bring a limited number of head of livestock with him from home and carry the animals as a project while attending school, if he so desires. Beef cattle must be tuberculin and abortion-tested bebore being admitted to the school farm, as the entire bovine herd is Federal accredited. Swine must have been double-treated for cholera before being brought on to the premises. Sheep will be admitted if disease-free.

Students who do not have livestock from their previous projects or purchases may secure market or breeding animals from the school herd or may purchase them elsewhere after attending school. Recommended students may secure a loan from the project fund at a nominal rate of interest to carry on this practical field. The project fund loan also furnishes feed at cost to the student projects, and the fund is reimbursed for all expenses when the stock is sold. This gives every student the opprtunity of becoming familiar with the ways and means of handling and feeding livestock, whether or not he has finances of his own for project operation. The opportunity to purchase breeding stock from the school herd or other purebred herds in the state through the project fund is also an incentive to start with proper foundation animals.

Projects vary in size from one to ten steers and up to 10 head of breeding cows, in the beef cattle majors. In swine, from five to fifty feeder pigs or one to five sows are the average projects. In sheep, from five to fifty lambs and ten to twenty head of breeding ewes are common as projects.

During the last year, students in the meat animals department raised or fed out for market eighty-six head of beef catle, four hundred and thirty head of swine and sixty-seven head of sheep in projects. Students received net returns of $10,540 in sales and $1400 additional in prize money from livestock shows.

DEPARTMENT ACTIVITIES

Students in the Meat Animals department take active participation in the three major livestock shows of the state. Here they compete against the west's leading adult livestock breeders and feeders in the open division, or against students of equal age in high school continuation or part-time work, or junior college students. During the last year, the project animals raised, owned and exhibited by the students won six grand championships, ten championships and more than 100 first to fourth places in the various exhibits. One of the out-

standing accomplishments was the winning of the grand champion steer, barrow and pen of barrows classes in the open division at the 1933 Great Western Livestock show at Los Angeles.

Another important activity is the Poly Royal agricultural show. This event takes place normally the week prior to the Interstate Junior show at South San Francisco. Student projects both in market and breeding classes are put on display before approximately 2000 persons from all parts of the state, and are entered in local competition.

A number of round-ups each year on stock ranches in the county find the Meat Animals students invited to take part in the roping, branding and castrating; dehorning, vaccinating and tattooing. This gives the students practice and observation in methods as carried on at some of the best ranches in the state.

In addition to showing their own stock at the livestock exhibits, many Polytechnic school students are called upon to assist herdsmen from the leading ranches of the western states. This gives the students practice and experience with outstanding showmen, and frequently leads to ultimate employment of the graduate.

RELATED SUBJECT MATTER

Only a part of the time of the Meat Animals student is taken up with his major field. In addition, he has an opportunity to acquire all of the book-keeping and farm accounting practices necessary for a manager or foreman employed on a large-scale enterprise; or a man in the livestock vocation for himself.

Another related course is that in agricultural mechanics. In this study, the student learns the operation and repair of all types of farm machinery typical of the livestock major in which he is enrolled. He learns to adjust and operate the common types of tractors, gas motors and electric motors. He learns farm carpentry and black-smithing, including horse-shoeing. He learns forge work and the common welding operations necessary, leather and sheet-metal work of a type which can be put to use on the average farm.

Another field of related subject matter includes retail marketing, under which is grouped business letter writing, advertising and retail selling. This course is developed from the standpoint of the practical farmer or farm manager.

The growing of crops necessary in the production of meat animals is taken up within the major courses. However, additional agricultural science is given to provide a thorough foundation of understanding in soil management, disease con-

trol, irrigation practices, necessary bacteriology and genetics and similar fields. Other subject matter includes political science, physical education and English. Music is optional.

CERTIFICATION OF ACCOMPLISHMENT

The two years of upper-division work lead to a certificate of completion for all students meeting the requirements, and to certificates of accomplishment for recommended students. This certificate is the recommendation of the department that the student is qualified to undertake employment in a field or several fields of meat animals enterprises.

Certificates of accomplishment are given in Livestock Feeding, Commercial Cattle Production, General Range Management, Beef Cattle Herdsman, Market Feeding of Swine, Swine Herdsman, Fitting and Showing of Purebred Swine, Feed Lot Management of Sheep, and Range and Purebred Herd Management.

The number of projects that have been successfully completed by a student, in addition to the abilities demonstrated in working with the school herds and flocks, do much to determine the ability of the student to qualify for such a job.

RECOMMENDATION AND PLACEMENT

Students who have completed their major courses and have secured or been placed in employment frequently register for an additional year of supervision. In such cases, the certificate of accomplishment is not awarded until the following year, when the signature of the livestock plant owner, manager or foreman is added to the certificate as further recommendation of ability.

The department has available the services of a part-time placement man who is in constant contact with the livestock and stockyards industries of the state. The placement man is on the lookout through the year for possible positions for Polytechnic school graduates, and is frequently called upon to place a graduate at the end of a school year or during the year. The latter is possible in case of advanced or highly recommended students. For example, two students were permanently placed on one of the major market lamb ranches of the state in time to help with the feeding and marketing of the spring crop of lambs.

This course outline is designed to give a general picture of the facilities and studies in this branch of agriculture. Any specific questions will be promptly answered. Address your communication to the Meat Animals Department, California Polytechnic School, San Luis Obispo, Calif.

CALIFORNIA

Practice Project Record Book

FOR USE IN TEACHING

Project Record Keeping and Accounting in High School Departments of Vocational Agriculture

Name of Pupil.....

Kind of Project.....

Net Profit or Loss $..... Labor Income $.....

Total Production.....
(Lbs., bu., or doz.)

Cost of Production per Unit $.....
(Lbs., bu., doz., etc.)

Grade Received .....

This practice record form has been prepared for classroom use as a device for teaching Project Record Keeping. It is **not** intended for use in keeping records of an actual project.

A Teacher's Manual to supplement the Practice Record is also available with complete instructions for each of the problems listed herein.

PREPARED BY

CALIFORNIA STATE DEPARTMENT OF EDUCATION
BUREAU OF AGRICULTURAL EDUCATION

PRICES

Practice Project Record Book.....5c each
Teacher's Manual.....No Charge

PUBLISHED AND FOR SALE BY

THE CALIFORNIA ASSOCIATION
FUTURE FARMERS OF AMERICA

POULTRY PROJECT RECORD

From the following diary, make the correct entries in your practice record book and determine:

(1) The **net profit.**

(2) The **total labor income.**

(3) The **net cost** for each **dozen eggs produced.**

Enter self labor at 15c per hour and other labor at 25c per hour.

Diary Record of Activities, Expenses and Receipts

Based on Project Record of Paul Baranek, San Juan Union High, Fair Oaks

Courtesy of A. L. Price, Instructor.

September 1, 1931. I am starting my project this year with 65 S. C. W. L. pullets raised as part of last year's project, and which I value at $1 apiece; 1 pound of Epsom salts valued at 5c; and 1 quart of BK worth 50c.

In addition to this flock of birds, I expect to raise 100 additional pullets for next year. I will house the laying flock in a part of our poultry house which I have already partitioned off, and will pay my father for the use of this house at the rate of $2 per month when my project is completed.

I will keep track of the value of the manure produced and spread the manure on the garden when I clean the dropping boards. I will pay my father for all the labor he does on my project above the value of the manure produced by my birds.

September 1. Purchased one 100 lb. sack mash @ $1.80 and one 100 lb. sack scratch @ $1.35.

September 12. Cleaned dropping boards and entered self labor to date 7 hrs.

September 15. Bought 1 sack scratch @ $1.35. Chore labor—2 hours self.

Septembr 30. Sold 99 dozen medium eggs, @ 14c. My brother takes these eggs to Sacramento or Lake Tahoe every few days, and I will make entries about every two weeks. Feeding and care—4 hours self labor. Total egg production for the month 1193. All hens healthy.

October 1. Bought two sacks of mash @ $1.80. I feed about 3½ pounds of green Ladino clover daily to my birds. It takes me an average of 5 minutes each day to cut this feed and give it to them. No charge other than my labor will be made for this feed as it would be wasted if I didn't use it. I will keep this labor separate and enter it at the end of the year so I can figure feed costs more easily.

October 15. Bought 1 sack mash @ $1.80; 1 sack scratch @ $1.45. Feeding and care, self labor, 4½ hours.

October 30. Sold 92 dozen mixed eggs @ 15c. Feeding and care, self labor, 3 hours. Total production for month 1110. No hens died or culled.

November 15. Bought 2 sacks mash @ $1.80; 1 sack scratch @ $1.50. Self labor, 3½ hours.

November 30. Sold 95 dozen mixed eggs during month @ 23c. Self labor gathering eggs, cleaning house, feeding, etc., 10 hours. Seven hours of this time was spent during the last three months gathering eggs. Mr. Price just called my attention to this, and hereafter it will be entered with other labor. Total production for month, 1137.

December 1. Bought 1 sack (100 lbs.) mash @ $1.85. Sold 2 cull hens, 6 pounds @ 20c per pound.

December 15. Bought 1 sack mash @ $1.95. Sold 43 dozen mixed eggs @ 22c. Bought 1 sack scratch @ $1.75.

December 30. Sold 48 dozen mixed eggs @ 22c. Self labor, 3 hours. Dad's labor, 6 hours. Total production for month, 1095. Two hens culled.

January 15, 1932. Bought 2 sacks of mash @ $1.90. 1 sack scratch @ $1.60.

January 30. Sold 98 dozen mixed eggs @ 22c; sold 3 cull hens, 8 lbs. @ 20c. Self labor, 11½ hours. Total production 1177. 3 hens culled.

February 15. Sold 54 doz. mixed eggs @ 15c; bought 2 sacks mash @ $1.75.
February 29. Sold 55 doz. mixed eggs @ 15c. Bought 2 sacks mash @ $1.75. 1 sack scratch @ $1.55. Production for month 1305; no hens culled or died. Dad has been taking care of my birds during this month. Haven't been feeling well.
March 1. Went to pospital for an operation.
March 7. Home again. Paid Dad for 24 hours labor @ 25c. Bought 6 pullets from Dad @ $1 apiece. These are White Leghorns the same as the rest of my flock. Bought 2 sacks scratch @ $1.55; 1 sack mash @ $1.75.
March 15. Sold 59 dozen eggs @ 14c.
March 30. Bought 2 sacks mash @ $1.70. Sold 58 dozen eggs @ 14c. Sold 1 3 lb. cull hen for 15c per pound. Total production for month, 1400. Self labor, 6 hours.
April 1. Collecting eggs, December, January and March, 6½ hrs. Mr. Price visited my project today and called my attention to this item again.
April 15. Bought 1 sack mash @ $1.70; 1 sack scratch @ $1.55. Sold 61 dozen mixed eggs @ 13c.
April 30. Bought 2 sacks mash @ $1.70. Sold 58 dozen eggs at 12c. Self labor fixing roosts, feeding and gathering eggs, 15 hours. Total production for month, 1438.
May 15. Bought 1½ sacks mash @ $1.75. Sold 60 dozen eggs @ 12c.
May 20. Paid Dad for 190 pounds oyster shell and bought 100 pounds at a store @ 60c per cwt.
May 30. Sold 59 dozen eggs @ 11c. Bought 1 sack scratch @ $1.55, 2 sacks mash @ $1.70. Self labor during May, 18 hours. Total production for month, 1437.
June 5. Found one hen dead this morning.
June 12. I will be at Lake Tahoe helping my brother until August 1 and Dad will take care of my birds and keep records while I'm away. Sold 49 dozen eggs @ 11c. Self labor, 9 hours. Another hen died today.
June 30. Bought 1 sack mash @ $1.65, 1 sack scratch @ $1.35. Sold 50 doz. mixed eggs @ 14c. Father's labor, 8 hours. Total production, 1166.
July 7. Bought 2 sacks mash @ $1.65.
July 15. Sold 42 dozen eggs @ 15c.
July 30. Bought 2 sacks mash @ $1.60. Sold 42 dozen eggs at 16c. Bought 2½ pounds nicotine sulfate @ 10c. Father's labor, 16 hours. Total production for July, 997.
August 2. Bought 2 sacks mash @ $1.60.
August 7. Sold 19 dozen eggs @ 16c.
August 12. Sold 16 dozen eggs @ 16c.
August 15. Self labor, feeding, care, etc., 8½ hours.
August 30. Self labor, feeding, care, etc., 9 hours.
August 31. Total production for August, 705.
Paid father $24.00 rent for poultry house.
Total labor for cutting green feed for birds, 36 hours self labor.
Will figure the interest on my investment @ 6 per cent.
I figure that my birds have produced 2500 pounds of droppings during the year, valued at $5.56 per ton.
At the close of my project, I have on hand 63 S. C. W. L. hens valued at 75c each; 50 pounds mash worth $1.60 per cwt.; and 21 dozen eggs which are worth 16c per dozen.

Paul's project goals, set up in his project plan were as follows. How close did he come to meeting them?

	Goal	Actual Accomplishment
1. Labor income per hour self labor	25c.	
2. Total net cost per hen	$3.00	
3. Total net cost per dozen eggs	14c	
4. Feed cost per hen	$1.50	
5. Total hours labor (self and other) per hen	3	
6. Yearly egg production per hen	200	

PROJECT OPERATION

Include in the Project Operation such information as will be of particular use in analyzing project results, but which may not be properly included in other records in this book. This record should supply supplementary information about the project.

Date

PROJECT INVENTORY

(Courtesy of W. T. Spanton, Western Regional Agent, Federal Board Vocational Education.)

1. INVENTORIES. More serious mistakes are probably made in the inventories than in any other part of project records. For this reason it is recommended that only "FOUNDATION STOCK" for livestock, poultry and dairy projects should be entered in the opening inventory, and that all buildings and equipment used, even though actually owned by the boy, be not inventoried, but that they be listed on the form below under the heading of "BUILDINGS AND EQUIPMENT—(Not Inventoried)" where their value and rental or charge for their use can be recorded and later entered as a Miscellaneous charge on pages 8-9 of the record book. Under average conditions where there would be a normal depreciation in value on buildings and equipment, there would be no serious objection to entering them in the opening inventory. However, there are many instances where these items, if inventoried, may show an actual increase in value, or the boy may sell certain pieces of equipment for more than their opening inventory value. This would not only result in no charge being made against the project for the use of these items, but in addition their increase in value or the profit resulting from their sale would ordinarily be credited to the project, which practice is seriously questionable when determining true costs of production and labor income.

By "FOUNDATION STOCK" is meant sows and gilts, ewes and bucks, dairy cows and bulls, beef cows and bulls for breeding purposes, and producing poultry flocks actually owned by the boy at the time the project is started; the products, offspring or increase of which is to be regarded as the "MAIN PRODUCT" that is being produced for home use or market. If additional purchases of "FOUNDATION STOCK" are made after the project is started, the purchase price should be entered on page 7 as an "additional investment" in the enterprise, and added with the opening inventory. If additional purchases of "MAIN PRODUCT" are made after the project is started, such as the purchase of pigs or shotes that are to be fattened out together with spring pigs farrowed by sows owned by the boy when the project was started, their cost should be recorded on pages 8-9 as a direct "Miscellaneous Charge." It will simplify matters greatly if all feed, fertilizers, seed and other similar supplies on hand at the beginning of the project be not inventoried in the opening inventory, but that their value be entered as a direct charge against the project on pages 8-9 under the heading of "Miscellaneous Expenses," since it is expected that they will be used up shortly any way. Similarly, the value of any "MAIN PRODUCT" such as pigs, beef calves, hatching eggs (soon to be converted into Main Product) or day old chicks which may be on hand at the time the project is started should not be listed in the opening inventory, but their value should be listed as a direct charge against the project on pages 8-9 of the record book under the heading of "Miscellaneous Expenses." All feed, fertilizers, seed and other supplies together with "FOUNDATION STOCK" and any "MAIN PRODUCT" still on hand when the project is completed, should be entered in the closing inventory if it has not been sold, lost, used at home or disposed of otherwise. Only the increase or decrease in value of "FOUNDATION STOCK" (and buildings and equipment if inventoried) should be entered in the last two columns of the inventory page. If and whenever buildings and equipment ARE inventoried, their depreciation in value should be added together with total decreases in value of "FOUNDATION STOCK," and then under no circumstances should rent or charge for their use be made against the project, since that would result in a double charge being made for the use of these items.

2. BUILDINGS AND EQUIPMENT—NOT INVENTORIED. Since the normal rate of depreciation for different kinds of farm buildings and equipment vary considerably, the rental rate or charge for their use will also vary in the same degree. This particular form will make it more convenient for these variations to be given proper consideration since each type of building and each different kind of equipment used can be listed separately and the total charge for their use can easily be determined by multiplying the rate of charge to be made by the total value. The sums of all individual charges should then be entered as a miscellaneous expense on pages 8-9 of the practice project record book.

The form given below is for your use in tabulating buildings and equipment not inventoried.

Date		KIND OF BUILDING OR EQUIPMENT	Value	Rate of Charge for Use	Length of Time Used	Total Charge for Use
		TOTAL CHARGES...				

Total Charges to be transferred to page 9 under "Misc. Expense" when the Project is closed.

PROJECT INVENTORY

(Courtesy of W. T. Spanton, Western Regional Agent, Federal Board Vocational Education.)

DATE	DESCRIPTION OF ITEMS	BEGINNING OF PROJECT			CLOSE OF PROJECT			FOUNDATION STOCK	
		Amount or Number	Price or Value Per Unit	Total Value	Amount or Number	Price or Value Per Unit	Total Value	Increase In Value	Decrease In Value
(1) Total Beginning Inventory Value.....$									

DATE	DESCRIPTION OF ITEMS	ADDITIONAL INVESTMENTS							
		Amount or Number	Price or Value Per Unit	Total Value					
(2) Total Additional Investments.....$									
(3) Total Beginning Inventory and Additional Investments (1) plus (2).....$									
(4) Total Closing Inventory.....							$		
(5) Totals of all increases (column 1) and decreases (column 2) on foundation stock (and on equipment if inventoried).....								$	$

PROJECT EXPENSES OR DEBITS

DATE		DESCRIPTION OF ITEMS	OVERHEAD		OPERATING AND MISCELLANEOUS EXPENSES OR DEBITS			
					Amount	Price Per Unit	Total Value	
		Total						

PROJECT EXPENSES OR DEBITS

DATE		DESCRIPTION OF ITEMS	OVERHEAD		OPERATING AND MISCELLANEOUS EXPENSES OR DEBITS			
					Amount	Price Per Unit	Total Value	
		Brought Forward						

PROJECT RECEIPTS OR CREDITS

DATE	DESCRIPTION OF ITEM	MAIN PROJECT			BY-PRODUCTS & MISCELLANEOUS RECEIPTS OR CREDITS		
		Amount	Price Per Unit	Total Value	Amount	Price Per Unit	Total Value
	Total						

PROJECT RECEIPTS OR CREDITS

DATE	DESCRIPTION OF ITEM	MAIN PROJECT			BY-PRODUCTS & MISCELLANEOUS RECEIPTS OR CREDITS		
		Amount	Price Per Unit	Total Value	Amount	Price Per Unit	Total Value
	Brought Forward						
	Total						

PROJECT LABOR RECORD

The purpose of this record is to show the amount of work done on the project by pupil, other hired help, horse, or machine. The charges for this labor should be entered under "operating expense" on pages 8-9, indicating kind, amount, value or cost. Transfer your charges regularly or if you prefer, as of August 31, 1932, in the problem.

Month	Date	DESCRIPTION OF ITEM	PUPIL		OTHERS		HORSE		MACHINE			
			Hr.	Value	Hr.	Cost	Hr.	Cost	Hr.	Cost	Hr.	Cost
		Total										

PROJECT SUMMARY

Permanent School Record for the Year 193...-193...

1. Name .....

2. Kind and Size of Project .....

3. Total Yield of Main Product ..... Number ..... Amount .....

RECEIPTS OR CREDITS

4. Total value of—(a) Main Product ..... See pages 10-11 .. $.....

   (b) By-Products and Misc. Credits. See pages 10-11 .. $.....

5. Total Closing Inventory ..... See page 7 .. $.....

6. Total Project Receipts or Credits ..... (Items 4a, 4b, 5) ..... $.....

EXPENSES OR DEBITS

7. Total Project Expenses—(a) Overhead ..... See pages 8-9 .. $.....

   (b) Operating and Misc. Exp. See pages 8-9 .. $.....

8. Total Opening Inventory and Additional Investments .... See page 7 .. $.....

9. Total Project Expenses or Debits (Items 7a plus 7b plus 8) ..... $.....

10. Total Net Profit or Loss (Items 6-9) ..... $.....

11. Total Hours Pupil Labor ..... See page 12 .. ..

12. Total Value Pupil Labor @ ..... $.....

13. Total Pupil Labor Income (Items 10 plus 12) ..... $.....

DETERMINING COST OF PRODUCTION OF THE MAIN PRODUCT

A. Total Project Expenses—

Item 7a ..... $.....

Item 7b ..... $.....

Item 5, col. 2, p. 7 ... $.....

Total ..... $.....

B. Total Project Credits to be Deducted—

Item 4b ..... $.....

Item 5, column 1, p. 7 .. $.....

Total Value of **unused** feed and supplies, see p. 7 Closing Inventory .. $.....

Total ..... $.....

14. Total Net Cost of Production of Main Product (A-B) ..... $.....

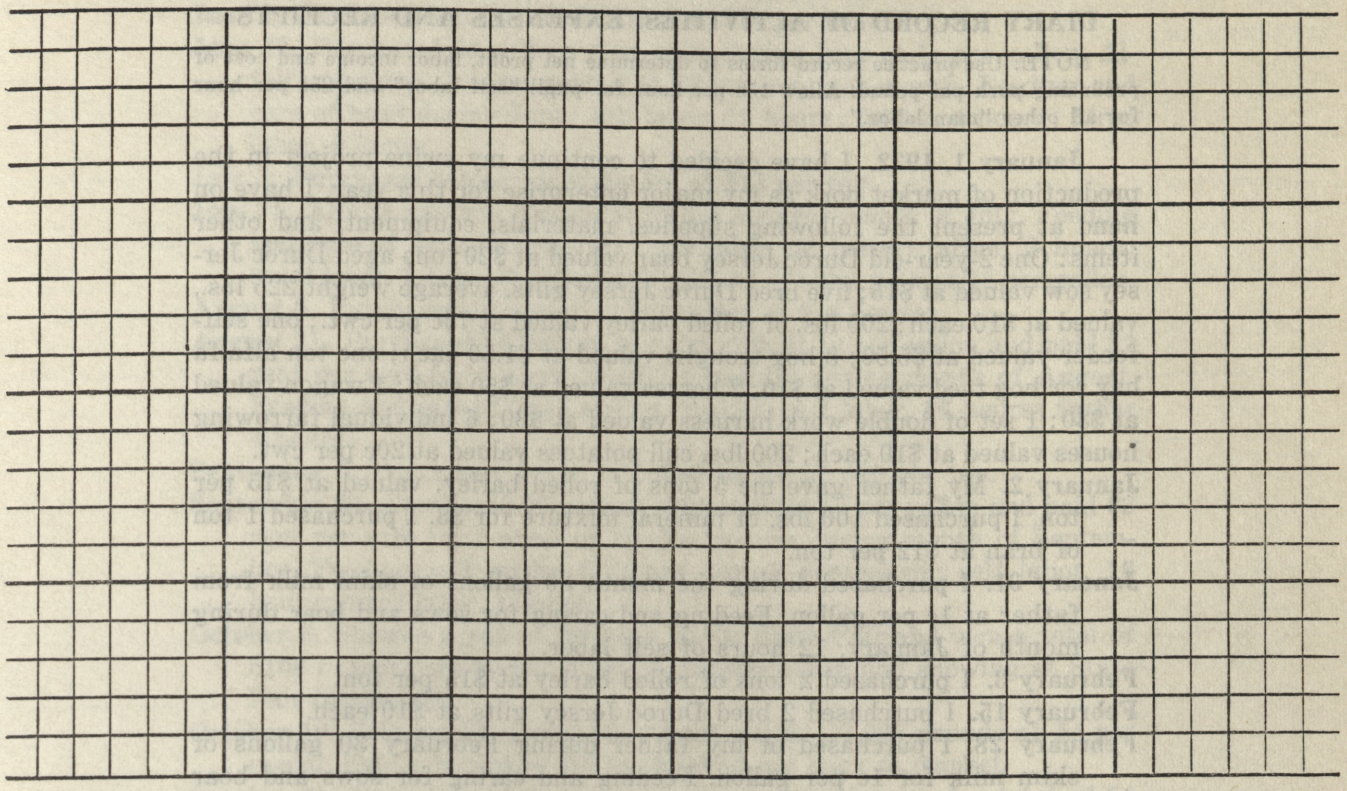
15. Total Net Cost of Production, per Unit of Production (Item 14 divided by Item 3) ..... $.....

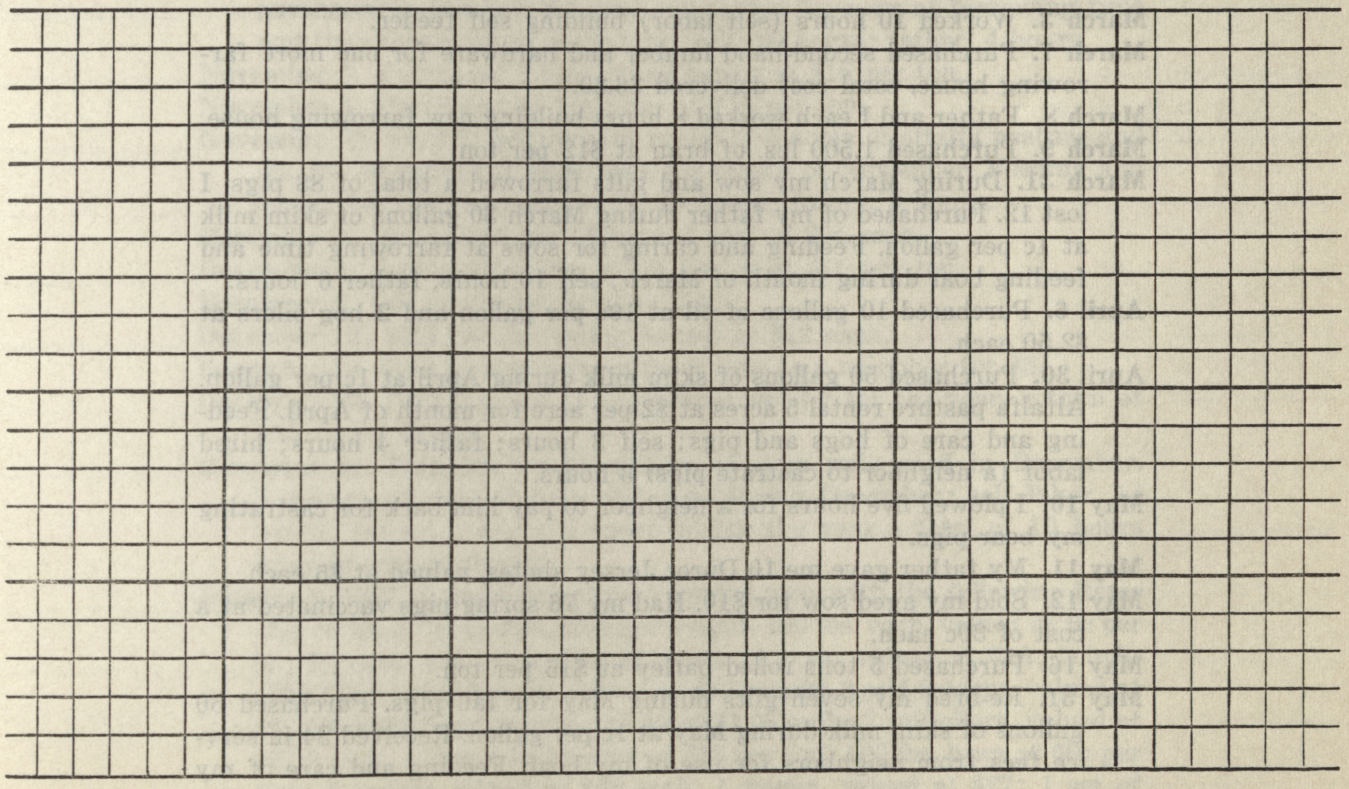
DAILY EGG PRODUCTION RECORD

Breed..... .....193..... to.....193.....

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Total eggs laid												
No. hens 1st of month												
No. hens died												
No. hens sold or culled												
No. hens added												
Average No. hens												
Average eggs per hen												
% production by flock for month												

PRODUCTION AND MARKET PRICE GRAPHS





SWINE PROJECT RECORD*

(Producing Market Pork.)

DIARY RECORD OF ACTIVITIES, EXPENSES AND RECEIPTS

NOTE: Use practice record forms to determine net profit, labor income and cost of producing pork per pound. Allow 15c per hour for pupil "self labor" and 25c per hour for all other "man labor."

January 1, 1932. I have decided to continue my swine project in the production of market pork as my major enterprise for this year. I have on hand at present the following supplies, materials, equipment, and other items: One 2-year-old Duroc Jersey boar valued at $20; one aged Duroc Jersey sow valued at $15; five bred Duroc Jersey gilts, average weight 225 lbs., valued at $10 each; 200 lbs. of rolled barley valued at 75c per cwt.; one self-feeder valued at $5.50; 8 hog troughs valued at $1.50 each; one ton alfalfa hay for hog feed valued at $10; 2 horses valued at $50 each; 1 wagon valued at $30; 1 set of double work harness valued at $30; 6 individual farrowing houses valued at $10 each; 200 lbs. cull potatoes valued at 20c per cwt.

January 2. My father gave me 5 tons of rolled barley, valued at $15 per ton. I purchased 100 lbs. of mineral mixture for $3. I purchased 1 ton of bran at $12 per ton.

January 31. I purchased during the month 30 gallons of skim milk from father at 1c per gallon. Feeding and caring for sows and boar during month of January, 12 hours of self labor.

February 3. I purchased 2 tons of rolled barley at $15 per ton.

February 15. I purchased 2 bred Duroc Jersey gilts at $10 each.

February 28. I purchased of my father during February 30 gallons of skim milk for 1c per gallon. Feeding and caring for sows and boar during month of February, 10 hours self labor.

March 2. My father gave me lumber and hardware for one self feeder, valued at $4.

March 3. Worked 10 hours (self labor) building self feeder.

March 7. Purchased second-hand lumber and hardware for one more farrowing house, total cost delivered $6.80.

March 8. Father and I each worked 8 hours building new farrowing house.

March 9. Purchased 1,500 lbs. of bran at $12 per ton.

March 31. During March my sow and gilts farrowed a total of 88 pigs. I lost 12. Purchased of my father during March 30 gallons of skim milk at 1c per gallon. Feeding and caring for sows at farrowing time and feeding boar during month of March; self 10 hours, father 6 hours.

April 6. Purchased 10 gallons of oil at 10c per gallon and 2 hog oilers at $2.50 each.

April 30. Purchased 50 gallons of skim milk during April at 1c per gallon. Alfalfa pasture rental 5 acres at $2 per acre for month of April. Feeding and care of hogs and pigs; self 8 hours; father 4 hours; hired labor (a neighbor to castrate pigs) 3 hours.

May 10. I plowed five hours for a neighbor to pay him back for castrating my boar pigs.

May 11. My father gave me 10 Duroc Jersey shotes, valued at $5 each.

May 12. Sold my aged sow for $10. Had my 76 spring pigs vaccinated at a cost of 30c each.

May 16. Purchased 5 tons rolled barley at $15 per ton.

May 31. Re-bred my seven gilts during May for fall pigs. Purchased 50 gallons of skim milk during May at 1c per gallon. Received $4 in service fees from neighbors for use of my boar. Feeding and care of my

* Taken from "Practice Project Record Book," The French-Bray Printing Co., Washington, D. C., courtesy W. T. Spanton.

hogs during May, 16 hours self labor. Rented 5 acres alfalfa pasture for month of May from my father for $2 per acre.

June 1. Purhased 5 tons rolled barley at $15 per ton.

June 30. Purchased 50 gallons skim milk during June at 1c per gallon. Alfalfa pasture—5 acres rented at $2 per acre per month. Feeding and care of hogs during June: self labor, 12 hours; father, 4 hours; hired labor, 3 hours.

July 3. Purchased 5 tons rolled barley at $15 per ton.

July 31. Alfalfa pasture, 5 acres at $2 per acre for month of July. Feeding and care of hogs during July: self labor, 16 hours; father, 2 hours; hired labor, 1 hour. Purchased 50 gallons of skim milk at 1c per gallon.

August 6. Purchased 10 tons of rolled barley at $15 per ton.

August 31. Purchased 50 gallons of skim milk at 1c per gallon and paid $2 rent per acre for 5 acres of alfalfa pasture during month of August. Feeding and care of hogs during August: self labor, 16 hours; father 4 hours.

September 5. Purchased 5 tons of rolled barley at $15 per ton.

September 30. Purchased 50 gallons skim milk at 1c per gallon and paid $2 rent per acre for 5 acres of alfalfa pasture during month of September. Feeding and caring for hogs during September: self labor, 16 hours; hired labor, 4 hours.

October 6. Showed a pen of fat hogs at the State Fair and won a total of $100 in premium money. Cost of transportation and showing at State Fair totaled $30.

October 10..Sold my 76 spring pigs, total weight 18,000 pounds at 5c per pound. Paid a neighbor $20 for hauling my hogs to market.

October 31. During October my seven young sows farrowed a total of 54 pigs. Ten died at farrowing time, leaving me 44 pigs. Paid $2 per acre for 5 acres of alfalfa pasture, and 50c for 50 gallons of skim milk purchased in October. Feeding and caring for sows at farrowing time and time consumed in marketing: self, 20 hours; father, 4 hours.

November 3. Purchased 5 tons rolled barley at $15 per ton.

November 5. Purchased ½ ton bran at $12 per ton.

November 30. Paid $2 per acre for rental of 5 acres of alfalfa pasture and 50c for 50 gallons of skim milk for month of November. Feeding and caring for sows and pigs: self, 10 hours; father, 3 hours.

December 1. Vaccinated my 44 pigs at cost of 30c each.

December 4. Purchased 6 tons rolled barley at $15 per ton.

December 5. One of my young sows died.

December 12. Sold two farrowing houses at $12 each.

December 20. Sold all hog manure from pens to a neighbor for $5.

December 30. Paid for rent of hog houses and lot for the year, a total of $20, to my father.

December 31. Paid 50c for 50 gallons of skim milk used in December. Feeding and care of sows and pigs during December: self labor, 14 hours; father, 2 hours. I spent during the year a total of 10 hours keeping project records.

January 1, 1933. I closed my project for the year with the following items still on hand: 44 shotes, average weight, 100 lbs. each, valued at 6c per lb.; 6 young sows valued at $12 each; 1 boar, valued at $10; 5 individual farrowing houses, valued at $8.50 each; 2 self feeders, valued at $4.40 each; 8 hog troughs, valued at $1.05 each; 2 self oilers, valued at $2.25 each; 4 tons rolled barley at $15 per ton; 100 lbs. bran at 60c per cwt.; 2 horses, valued at $60 each; 1 wagon, valued at $27; 1 set of double work harness, valued at $27.

PROJECT OPERATION

Include in the Project Operation such information as will be of particular use in analyzing project results, but which may not be properly included in other records in this book. This record should supply supplementary information about the project.

Date		

PROJECT INVENTORY

(Courtesy of W. T. Spanton, Western Regional Agent, Federal Board Vocational Education.)

1. INVENTORIES. More serious mistakes are probably made in the inventories than in any other part of project records. For this reason it is recommended that only "FOUNDATION STOCK" for livestock, poultry and dairy projects should be entered in the opening inventory, and that all buildings and equipment used, even though actually owned by the boy, be not inventoried, but that they be listed on the form below under the heading of "BUILDINGS AND EQUIPMENT—(Not Inventoried)" where their value and rental or charge for their use can be recorded and later entered as a Miscellaneous charge on pages 21-22 of the record book. Under average conditions where there would be a normal depreciation in value on buildings and equipment, there would be no serious objection to entering them in the opening inventory. However, there are many instances where these items, if inventoried, may show an actual increase in value, or the boy may sell certain pieces of equipment for more than their opening inventory value. This would not only result in no charge being made against the project for the use of these items, but in addition their increase in value or the profit resulting from their sale would ordinarily be credited to the project, which practice is seriously questionable when determining true costs of production and labor income.

By "FOUNDATION STOCK" is meant sows and gilts, ewes and bucks, dairy cows and bulls, beef cows and bulls for breeding purposes, and producing poultry flocks actually owned by the boy at the time the project is started; the products, offspring or increase of which is to be regarded as the "MAIN PRODUCT" that is being produced for home use or market. If additional purchases of "FOUNDATION STOCK" are made after the project is started, the purchase price should be entered on page 20 as an "additional investment" in the enterprise, and added with the opening inventory. If additional purchases of "MAIN PRODUCT" are made after the project is started, such as the purchase of pigs or shotes that are to be fattened out together with spring pigs farrowed by sows owned by the boy when the project was started, their cost should be recorded on pages 21-22 as a direct "Miscellaneous Charge." It will simplify matters greatly if all feed, fertilizers, seed and other similar supplies on hand at the beginning of the project **be not inventoried** in the opening inventory, but that their value be entered as a direct charge against the project on pages 21-22 under the heading of "Miscellaneous Expenses," since it is expected that they will be used up shortly any way. Similarly, the value of any "MAIN PRODUCT" such as pigs, beef calves, hatching eggs (soon to be converted into Main Product) or day old chicks which may be on hand at the time the project is started should not be listed in the opening inventory, but their value should be listed as a direct charge against the project on pages 21-22 of the record book under the heading of "Miscellaneous Expenses." All feed, fertilizers, seed and other supplies together with "FOUNDATION STOCK" and any "MAIN PRODUCT" still on hand when the project is completed, should be entered in the closing inventory if it has not been sold, lost, used at home or disposed of otherwise. Only the increase or decrease in value of "FOUNDATION STOCK" (and buildings and equipment if inventoried) should be entered in the last two columns of the inventory page. If and whenever buildings and equipment ARE inventoried, their depreciation in value should be added together with total decreases in value of "FOUNDATION STOCK," and then under no circumstances should rent or charge for their use be made against the project, since that would result in a double charge being made for the use of these items.

2. BUILDINGS AND EQUIPMENT—NOT INVENTORIED. Since the normal rate of depreciation for different kinds of farm buildings and equipment vary considerably, the rental rate or charge for their use will also vary in the same degree. This particular form will make it more convenient for these variations to be given proper consideration since each type of building and each different kind of equipment used can be listed separately and the total charge for their use can easily be determined by multiplying the rate of charge to be made by the total value. The sums of all individual charges should then be entered as a miscellaneous expense on pages 21-22 of the practice project record book.

The form given below is for your use in tabulating buildings and equipment not inventoried.

Date		KIND OF BUILDING OR EQUIPMENT	Value	Rate of Charge for Use	Length of Time Used	Total Charge for Use
					TOTAL CHARGES...	

Total Charges to be transferred to page 9 under "Misc. Expense" when the Project is closed.

PROJECT INVENTORY

(Courtesy of W. T. Spanton, Western Regional Agent, Federal Board Vocational Education.)

DATE	DESCRIPTION OF ITEMS	BEGINNING OF PROJECT			CLOSE OF PROJECT			FOUNDATION STOCK	
		Amount or Number	Price or Value Per Unit	Total Value	Amount or Number	Price or Value Per Unit	Total Value	Decrease In Value	Increase In Value

(1) Total Beginning Inventory Value.....$.....

DATE	DESCRIPTION OF ITEMS	ADDITIONAL INVESTMENTS							
		Amount or Number	Price or Value Per Unit	Total Value					

(2) Total Additional Investments.....$.....

(3) Total Beginning Inventory and Additional Investments (1) plus (2).....$.....

(4) Total Closing Inventory.....$.....

(5) Totals of all increases (column 1) and decreases (column 2) on foundation stock (and on equipment if inventoried).....$.....$.....

PROJECT EXPENSES OR DEBITS

DATE		DESCRIPTION OF ITEMS	OVERHEAD		OPERATING AND MISCELLANEOUS EXPENSES OR DEBITS			
					Amount	Price Per Unit	Total Value	
		Total						

PROJECT EXPENSES OR DEBITS

DATE		DESCRIPTION OF ITEMS	OVERHEAD		OPERATING AND MISCELLANEOUS EXPENSES OR DEBITS			
					Amount	Price Per Unit	Total Value	
		Brought Forward						
		Total						

PROJECT RECEIPTS OR CREDITS

DATE	DESCRIPTION OF ITEM	MAIN PROJECT			BY-PRODUCTS & MISCELLANEOUS RECEIPTS OR CREDITS		
		Amount	Price Per Unit	Total Value	Amount	Price Per Unit	Total Value
	Total						

PROJECT LABOR RECORD

The purpose of this record is to show the amount of work done on the project by pupil, other hired help, horse, or machine. The charges for this labor should be entered under "operating expense" on pages 21-22, indicating kind, amount, value or cost. Transfer your charges regularly or if you prefer, as of January 1, 1933, in your problem.

Month	Date	DESCRIPTION OF ITEM	PUPIL		OTHERS		HORSE		MACHINE			
			Hr.	Value	Hr.	Cost	Hr.	Cost	Hr.	Cost	Hr.	Cost
		Total										

PROJECT SUMMARY

Permanent School Record for the Year 193...-193...

1. Name .....

2. Kind and Size of Project .....

3. Total Yield of Main Product ..... Number ..... Amount .....

RECEIPTS OR CREDITS

4. Total value of—(a) Main Product ..... See page 23.. $.....

   (b) By-Products and Misc. Credits .... See page 23.. $.....

5. Total Closing Inventory ..... See page 20.. $.....

6. Total Project Receipts or Credits ..... (Items 4a, 4b, 5) ..... $.....

EXPENSES OR DEBITS

7. Total Project Expenses—(a) Overhead ..... See pages 21-22.. $.....

   (b) Operating and Misc. Exp. See pp. 21-22.. $.....

8. Total Opening Inventory and Additional Investments... See page 20.. $.....

9. Total Project Expenses or Debits (Items 7a plus 7b plus 8) ..... $.....

10. Total Net Profit or Loss (Items 6-9) ..... $.....

11. Total Hours Pupil Labor ..... See page 24.. .....

12. Total Value Pupil Labor @ ..... $.....

13. Total Pupil Labor Income (Items 10 plus 12) ..... $.....

DETERMINING COST OF PRODUCTION OF THE MAIN PRODUCT

A. Total Project Expenses—

Item 7a ..... $.....

Item 7b ..... $.....

Item 5, col. 2, p. 20.. $.....

Total..... $.....

B. Total Project Credits to be Deducted—

Item 4b ..... $.....

Item 5, column 1, p. 20. $.....

Total Value of **unused** feed and supplies, see p. 20 Closing Inventory. $.....

Total..... $.....

14. Total Net Cost of Production of Main Product (A-B) ..... $.....

15. Total Net Cost of Production, per Unit of Production (Item 14 divided by Item 3) ..... $.....

UNIT II. PRODUCING PULLETS

In a baby chick project, the purpose of which is to raise pullets to form the basis for an egg production project the following year, we find the following items in the project diary:

Problem No. 1. Under date of February 6, this boy purchased 300 White Leghorn baby chicks at 15c each. Should this item be entered as a direct charge against the project under project expenses or on the inventory page as additional investment? (The project started Jan. 1.)

Problem No. 2. After the boy had finished using the electric brooder, he rented it to a neighbor for two months at one dollar per month. What entry should be made in the boy's project record? Why?

Problem No. 3. On July 3, the boy killed two cockerels to be used at home (probably for a 4th of July picnic). What entry should be made? Why?

Problem No. 4. Before this project closed, the pullets began to lay and under date of October 31, we find this item in his diary: "Sold 6 dozen eggs to local grocery store for 21c per dozen." What entry should be made? Why?

UNIT III. PRODUCING LAMBS FOR LIVESTOCK SHOWS

A boy is carrying a sheep project, the object of which is to produce market lambs.

His 6 ewes drop 10 lambs and he selects 3 to feed out separately to show and sell at the Fat Stock Show. This pen will receive special care and feed, and the cost of production per pound will be higher than for the 7 remaining lambs. Which should he do:

(a) Credit the market lamb project with the value of these 3 lambs at the time they were separated from the rest and keep separate records on the show stock; or

(b) Keep one record for all the sheep and do not enter in records extra labor for blocking and training; cost of transporting to Fair and premiums won?

If a separate record is kept for sheep to be shown, should this extra labor and cost of showing be charged? Should premium money won be entered? If so, where?

THE CALIFORNIA FUTURE FARMER

Vol. IV SAN LUIS OBISPO, CALIF., DECEMBER, 1934 No. 4



It's not "in the bag" but "in the cup" when the Santa Rosa high school Future Farmer dairy cattle judging team starts after the national championship. Meet the winners — left to right, Richard Gray, Lex Murray, Noble Ledson and Frank Noonan. The first three were on the dairy cattle judging team and Noonan was on the milk judging team which placed fifth in the national. The background? Just a dairy cattle judging contest, typical of the competition in which this quartet excelled.

Around the State

MIRANDA—Leslie Fearrien has 90 sheep and 125 Angora goats for his project.

CERES—The chapter is able to report its third 100 per cent paid-up membership in the last four years.

VENTURA—The chapter has established weekly Future Farmer meetings, made formal with typed programs and including motion pictures and speakers. The gatherings are interesting and draw full attendance. Treasury receipts have been boosted with a concession booth at the last two student body dances.

NAPA—The chapter will come close to 100 per cent membership in the agriculture department, with 58 students enrolled, 16 now Greenhands, 13 Junior Farmers, 3 State Farmers and one American Farmer. Sixteen new agriculture students have signed applications for Greenhands and will be initiated soon.

FALLBROOK—Chapter members have designed and built a low-cost desk for the farm office. In addition to having pigeon holes and drawers for the usual farm papers, a special compartment is provided for filing agricultural bulletins. Plans for this desk may be secured from Frank Garcia, Fallbrook high school, Fallbrook, Calif.

HOLLISTER—Chapter members will be kept busy during the winter, with projects under way totaling 40,000 tomato plants, 25 acres of beets, three purebred beef calves, 250 chickens, seven hogs, an acre of peas, four acres of potatoes, seven acres of oats and five acres of miscellaneous department projects. Others will start their projects in the spring.

WHEATLAND—The chapter provided funds for six students to attend the Great Western Livestock show at Los Angeles, through a boxing and wrestling show. Boys constructed the ring in the agricultural mechanics class and put on three wrestling and three boxing bouts. A total of 152 persons paid admission to see the show, at 10 cents for students and 20 cents for adults.

PATTERSON—The treasury is in its healthiest condition in history as a result of candy and plant sales, and sponsoring the picture "Dude Ranger." Current activities include weekly meetings during the activities period, regular monthly night meetings and chapter basketball practice each Tuesday evening. The local 4-H club team is the first opponent. A snow trip to Long Barn was planned during Thanksgiving vacation.

ESCONDIDO—Four students are raising more than 600 turkeys for the Thanksgiving and Christmas trade. One project operator made a record of 86 per cent hatch at a local plant, through careful egg selection. A. P. Holly of Ramona, turkey breeder, showed his interest in the young producers by making up selected pens for sale at a low price. Three students bought ten hens and four toms from this offer, to grade up their flocks.

NORWALK—Chapter members from the Excelsior Union high school and the "baby chapter" at Downey called attention to the Great Western Livestock show with a livestock display on the roof garden of the May company in Los Angeles. Shown for an entire Saturday and viewed by thousands of metropolitan shoppers were a pen of market lambs and a pen of swine. In attendance were Alex Benjestorf of the Excelsior chapter and Dale Andrews of Downey.

GRIDLEY—Initiation by outside teams has proved popular at this chapter recently. Seventeen Greenhands of the Gridley chapter were taken into the ranks recently at home, with an initiation team from Live Oak in charge. The folowing evening, eleven Gridley boys were initiated into the Junior Farmer degree at Marysville. At the home ceremony, entertainment followed with two fast games of basketball, topped off with refreshments of pie and chocolate.

TRACY—Another Future Farmer alumni association has been added to those springing up over the state. Nucleus is furnished by four former chapter members now attending the University farm at Davis, Fred Irwin, Carl Lenander, Raymond Sattler and Kenneth Greer. These young men have called the first organization meeting for December 14, and hope to enroll many boys living and farming in the Tracy district. The prospective alumni association requested and received the approval of the local chapter in organizing.

--- *With the Future Farmer Chapters*

SUSANVILLE—Members are getting good experience as well as doing community service in agricultural mechanics. The boys recently poured a 16 by 40 concrete poultry house floor at the Johnson farm near Standish, and have plans and material ready to construct a garage for the school bus and one private car.

REDDING—Members recently held their first Round-Up Ball and Carnival, which included excellent dance music, carnival games and prizes for the best costumes. One chapter member furnished apples for forty gallons of cider. The chapter made a profit of $73, to be used for the annual Parent and Son banquet next spring.

ORLAND—This chapter and Hamilton City recently held a joint initiation, taking 35 boys into the Greenhand degree. The Hamilton chapter conducted the initiation. The session opened with a short comedy film, followed by the initiation stunts, which were declared to be "adequate." Refreshments were served to the 65 boys in attendance.

PORTERVILLE—Swine exhibitors in the chapter won $36 in prize money at the Great Western show at Los Angeles, in addition to an average price of $7.10 per hundred for their animals. John Keck took five places with Polands, Hal Campbell two with Hampshires and Dennis Grigsby three places with Chesters and a fifth in showmanship.

CAMPBELL—The initiation team from Centerville raised 22 boys of the local chapter to the Greenhand degree at a recent initiation. While the Campbell chapter appreciated the work of the visitors, it did not prevent the hosts from triumphing 15-9 in an interchapter basketball game afterwards. Refreshments and arrangements for a return game at Centerville completed the evening.

ONTARIO—Chaffey Union took first place in a dairy cattle judging contest held at the Richmond farm in Riverside recently. Perris and San Bernardino chapter teams took second and third. Wilbur Yost of Chaffey was second high individual and Stanley Salyer third. Bob Perrin was high and Emil Fietz fourth in Holsteins, and Salyer was first and Hoyt Houchen second in Jerseys.

NEWMAN—A chapter cow-testing association is in full swing at the high school here. A total of 356 cows have been signed for the full 10 months of school. The chapter's new 24-bottle electric-propelled tester, in charge of President Elmo Morganti, is being put to good use. Each boy in the association assists with his own samples. Records of high individuals are being published each month in the local paper.

LODI—The farm management class recently spent a day visiting the industrial section of San Francisco. Firms handling produce, eggs,meat, livestock and grapes were hosts to the boys, with company officials explaining steps in the various operations. The boys also went through the steamship President Hoover. A better idea of the procedure necessary in handling raw products from the farm, was gained from the trip.

GILROY—Sixteen Greenhands "rode the pipe" instead of the goat at a recent initiation. A section of irrigation pipe suspended from the rafters made an insecure foundation for boxing and pillow fights. Entertainment features of initiation night included an exhibition of fencing by two Japanese boys, and cowboy music on the accordian and harmonica by Frankie Gianelli and George Gilroy. Coffee and doughnuts were on the refreshment menu.

TURLOCK—More than 100 residents of the community attended the recent open-house held to display the renovated agriculture building and shop. Visitors competed in three contests: guessing the weight of a pumpkin grown by Theodore Martella, number of seeds in a jar, and identifying plant and weed seeds. The closest guesser on the weight of the 140-pound pumpkin won the vegetable as a prize, but had to carry it out himself. Visitors received their copies of the new Turlock Broadcaster, blossomed into a 5-page quarterly. Gunnar Sondeno was toastmaster at the meeting following inspection. Everett Spafford, agricultural mechanics instructor at Modesto high, was the speaker of the evening. Music and refreshments concluded the program. Boys working under Chairman Sondeno included Bill Vogt, Vernon Worrell, Donald Spahnle, Elmer Abel, Don Seymore, Albert Brahm, Walter Ricardo and Carl Vieira.

This Month in Orchard and Garden

HOME LANDSCAPING

December is the month in which most of the shrubbery trimming is done. Most of the deciduous plants have shed their leaves and are ready for their annual winter trimming. There is a tendency to trim too many plants into a ball-shape. There are very few plants that should be trimmed this way, and there is seldom any excuse for this type of pruning, except in formal gardens. Most deciduous shrubs should be thinned out to allow for new growth.

The majority of deciduous shrubs are grown for their flowers and since the buds that develop into flowers were formed last summer we do not wish to destroy them. Thin out the plants so that new growth will start next spring with the idea of having flowers next year.

The person pruning a shrub must always look ahead a year and figure out the results of not enough or too much pruning. In many cases it is best to take out several leaders each year, especially in shrubs that send up leaders from the crown, and allow the new ones to develop. Many times with shrubs that have been neglected for several years it is best to sacrifice one year's blooms to develop the next year's crop.

Practicing what we preach, we did this with our California holly. Last year we cut very severely on the old shrubs and forced a lot of new growth with the result that we have excellent berries this year. This should be done on the California holly where the stems of berries are to be cut for decorations.

The cotoneasters and pyracanthus should be trimmed now. One policy is to trim about the time that branches of the berries are to be used for decorative purposes. We have many inquiries every year about the propagation of these plants. The best results are obtained by gathering the seed this month and crushing them between the fingers, a nice "gooey" job; spreading them on a paper and allowing to dry for a couple of weeks and planting them in leaf mold and sand, or peat and sand, in January. They will grow by just drying the berries, but better germination is obtained by crushing them first. The seeds may be planted in flats or in a cold frame.

Since we are discussing propagation, December is a good month to start the hardwood cuttings. The cuttings that are to be planted outside, such as roses, plane trees, willows, poplar, lilac, syringa and buddleia may be cut, tied into bundles and stored in sawdust until weather permits placing them in nursery rows. These cuttings should be even in diameter, from one-fourth inch to three-fourths inch, and not over one foot in length. The cuttings that have buds too far apart should be discarded in favor of ones with buds closer together. Many of these hardwood cuttings will have nice calluses by the time they are ready to be planted in the rows.

Some of the evergreens may be taken by cuttings now. All should be of hardwood. These cuttings should be placed in sand in a glass house or lath house and should be potted as soon as roots appear. Cuttings that may be made now are, hibiscus, lantana, iochroma, privet, oleander, plumbago, streptosolen, elaeagnus, fuchsia, abelia, ceanothus and boxwood. It is a little early for conifer cuttings, but if it is necessary to put them in now be sure to pot them from the sand as soon as the callus forms or they will die.

December, like November, is a peculiar month in which to plant many flowering plants. It is both too late and too early for many things. There are, however, some seeds that may be planted now, providing it doesn't get too cold for them, in your district. Among those which should be planted are, California poppy, clarkia, lupin, candytuft, nemesia, mignonette, calendula, sweet alyssum, godetia and bachelor buttons.

In shelter and in flats may be planted columbine, delphinium, pansies, phlox, stocks, snapdragons, cinerarias and primroses.

December is a good month to move and divide, if they need dividing, plants of cannas, columbine, delphinium, gerbena, phlox, bleeding heart and German iris. It is yet a trifle early to divide Shasta daisies and chrysanthemums.

FRUIT TREES

Deciduous fruits are dormant now and most of the pruning is over. Now is the time to think about the insects. Look the orchard over and see what insects are doing the damage. This season is the best to spray for the armored sucking pests, among which are the scale insects. Be sure that the spray outfit is in good condition as the effectiveness of the spray depends almost entirely on the method of its application. The oil sprays are best for the destruction of the scale insects and the oil must be held in suspension by agitation of the spray mix; so the more efficient the agitation in the spray outfit, coupled with the pressure with which it is applied, the better your success in getting a large kill. Buy your spray material from a reliable, well-established firm or mix your own spray but do not try a spray about which you are doubtful. Discuss all spraying with your agriculture instructor before applying. There have been many spurious products placed on the market that are both useless and harmful to the trees.

Trees that have moss and lichens on them should be sprayed to rid the trees of this troublesome pest. One and one-half to two pounds of caustic soda to one hundred gallons of water will do the work. This may be mixed with the regular spray.

New trees for new plantings or replacement of old trees should be sought now. As with the sprays, be careful about obtaining only the best trees. Many nurseries are offering pedigreed trees; that is, ones with buds or grafts taken from trees of known production. We heartily recommend that trees of this type be sought. It is just as important, or more so, as knowing the pedigree of an animal you would buy.

All young trees should be carefully root-pruned and cut to the desired height on the trunk. All small, withered roots should be pruned back to fresh wood so that they may heal properly and start new growth. The young tree should be planted to the correct depth as indicated on the crown of the tree. Great danger may be caused by planting too deep or too shallow.

Frequently we speak of individual tree performance and advocate its use in keeping records of the orchard production. Harry Alter of Chaffey high school sends the following information on keeping tree records. This type of record may be kept on deciduous orchards as well as citrus.

"In keeping the records on the bearing citrus orchard there is nothing that is neglected quite as much as the individual tree records. On the commercial orchard it is not necessary to go to a lot of expense and work keeping an elaborate set of records on the amount of fruit produced per tree. The purpose of the records should be to locate the good and poor trees.

"A good, simple and inexpensive system is about as follows:

1. Make a chart allowing one square for each tree.
2. Judge the tree and fruit as to excellent, good, fair, etc., and mark with the letter E, G, or F, in the square corresponding to the tree judged.
3. If the tree has an excellent crop on three sides and no crop on the fourth, draw a line across these squares on the side corresponding to the "no crop" side. This will help you to locate "off type" trees.
4. After keeping records such as these for three years the grower can locate each non-producer; then he can top work or plant a new tree.

"Two days work each year will keep records of this sort on ten acres. One grove of 1000 trees was found to have 200 trees judged as either non-producers or poor. Judgment should not be passed on the trees after only one year of records because sometimes other conditions have influenced the crop."

TRUCK CROPS

As with annual flowering plants, December is an in-between month for most commercial plantings and almost the same for home plantings. Some commercial plantings are being made in sections where the weather will permit of spinach, mustard for greens, onion seeds and sets, peas, turnips, beets and lettuce. We hesitate to offer any varieties of the above as the types vary so much with the locality at this time of the year. We offer the names of the varieties grown in our own locality here at San Luis Obispo but before planting for yourself discuss the variety with your instructor as to whether that is correct for your locality. Spinach, prickly-seeded

Continued to page 12

THE CALIFORNIA FUTURE FARMER

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THE FUTURE FARMERS OF AMERICA

The state organization of students of high school vocational agriculture.

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Paul Harrison, Kerman.....Assoc. Editor

Address all communications to

THE CALIFORNIA FUTURE FARMER, California Polytechnic School, San Luis Obispo, Calif.

"Learning to Do, Doing to Learn; Earning to Live, Living to Serve."

Lack of space and mechanical and financial problems connected with advertising have thus far prevented the California Future Farmer magazine from soliciting or accepting advertising. However, this publication can and should provide a medium for getting prospective Future Farmer buyers and sellers togehter.

Accordingly, this plan will be tried *FOR ONE MONTH ONLY*. A column will be set aside to list all chapters in which members have livestock, poultry or eggs, seeds or plants for sale. The lists will be grouped, as for example: "Poland-China gilts or boars, Modesto, Porterville, Santa Rosa. Dairy cattle, Holstein heifer calves, Lodi, Petaluma, Chico, etc."

This will permit prospective buyers to communicate with the nearest chapter, or any other they desire, for specific information on ages, prices, etc. The California Future Farmer will make no charge for this service listing, nor assume any responsibility whatever for the quality or condition of the product. It is only providing a service in getting buyer and seller together.

This will be tried out in the January issue. All copy must be received at San Luis Obispo by the morning of December 26. Please be as brief as possible—a post-card will do nicely. Simply state for example: "Brentwood chapter members have for sale Leghorn hatching eggs, certified milo maize seed, purebred Southdown ewe lambs."

In the February issue, we will have some announcement as to the effectiveness of the service, and may continue it in March or April. At present, however, plans are only for the January issue.

Future Farmer activities will be the discussion topic at all district meetings of agriculture teachers in the south during January. The December meetings are being given over with discussions on content for agricultural courses.

Tragedy struck the membership of the California Association of Future Farmers of America last month when Melvin Bowles, John Kraus and Elzivir Kruger, all of Earlimart and all members of the Delano high school chapter, were killed near Bakersfield in an automobile accident. The deepest sympathy to their parents and friends is expressed by the entire membership of the California Association. The boys' instructor, C. A. Cazaly, and Russell Carver, president of the high school student body, survived the crash with serious injuries. To them, the California members extend sincere wishes for rapid recovery.

The authors of your monthly columns in livestock, dairy, poultry and horticulture projects and record books want to make suggestions which meet your most pressing problems. They have stated that they will appreciate any suggestions you may have for topics to discuss. Address your suggestion to the author, California Polytechnic; or to the magazine.

Enrollment in the agriculture department at Williams high increased 100 per cent this year with the addition of courses for freshmen. A complete community survey in the high school district is determining the program of the department. Community service includes pruning and spraying of family orchards, using for the latter a rig overhauled in the school shop. Recently the Future Farmers were hosts to the Boys' League of the school with a barbecue.

The Hemet chapter is believed the first in the southern counties to secure a joint farm production credit loan for use of its members. Because the $500 borrowed will go to finance many different types of enterprises, it is what is known as a "barnyard" loan. Closely supervising the types of enterprises and uses for the funds, the chapter is re-loaning in amounts as low as $10.

Hamilton City members are paying for dues, Future Farmer pins and expenses for a speaker on the Future Farmer radio program, by pulling blackberry vines, knocking almonds and conducting a refreshment stand at athletics contests. The funds will also provide refreshments at the parties.

Tracy chapter initiated ten members into the Greenhand degree recently. New members are Frank Dompe, Bud Hudson, Tony Escobar, Neil Wilcox, Clarence Perry, Louis Hinkson, Andrew Ridoni, Joe Gomez, Bilert Gomez and Roy Mehring.

FUTURE FARMER CALENDAR

DECEMBER

Dec. 10—VOCATIONAL AGRICULTURE, KPO, KFI, KFSD, 12 o'clock noon, "Care and Housing of Farm Machinery."
Dec. 15—State and Federal reports due from advisers.
Dec. 17—VOCATIONAL AGRICULTURE, KPO, KFI, KFSD, 12 o'clock noon, "Tree and Plant Pests."
Dec. 25—MERRY CHRISTMAS from the CALIFORNIA FUTURE FARMER MAGAZINE.

JANUARY

Jan. 1—Preliminary estimate on Smith-Hughes reimbursement due.
Jan. 5—California Future Farmer program, KGO, 12:15 to 1 o'clock.
Jan. 7—VOCATIONAL AGRICULTURE, KPO, KFI, KFSD, 12 o'clock noon, "Selecting Dairy Cattle."
Jan. 14—VOCATIONAL AGRICULTURE, KPO, KFI, KFSD, 12 o'clock noon, "'Selecting the Poultry Breeding Flock."
Jan. 15—State Farmer degree applications due in state office.
Jan. 21—VOCATIONAL AGRICULTURE, KPO, KFI, KFSD, 12 o'clock noon, "Growing Lambs for Spring Shows, Market and Breeding."
Jan. 28—VOCATIONAL AGRICULTURE, KPO, KFI, KFSD, 12 o'clock noon, "Spring Care and Management of Beef Cows."

Barnyard Activities for December

I have just returned home from the Great Western Livestock show at Los Angeles. In the Future Farmer division the exhibit was an improvement, in many respects, over last year. But the order was as usual, the hogs were good, the lambs fair and the steers not quite so good as the lambs. It seems to me that you boys who are interested in lamb production have a wonderful opportunity to demonstrate some worthwhile progress. You can find plenty of examples right here in California, to use as goals.

The grand champion lamb and the grand champion carload in the open class would look right anywhere. They were bred and fed in this state, and so were the grand champion individual and carload of steers. The feeds used with all of these were mostly California grown—barley, oats, alfalfa hay, some bran or beet pulp and cottonseed meal. A little linseed oil meal was also used; it may have been produced in the Imperial valley.

STEERS

I am of the opinion that some of you may have the notion that all of the rations proposed in this column and all of the plans are meant for show animals and nothting else. It is true that most of the dates and weights used are those of steers being fitted for some show. The reason for that is to make the recommendations more definite and because most of the steers being fed in Future Farmer projects are being fitted for some show, if they get good enough. But I would like to impress on you that the general principles of correct feeding for show or for market are the same.

You may use a greater variety of feeds for show steers than for market ones, but the balance should be the same. You must pay more attention to the calendar with show steers, for the show date cannot be moved to accommodate the condition of the steers, while if you are feeding for market, you will ship them when they are ready. To get them ready for a definite date and keep them smooth may require the purchase of some relatively high-priced feeds for show steers which would not be justified for market animals, but the basic job is the same. Only the show fitting is the harder. So, if you learn how to properly fit show steers you can certainly do a good job feeding for the market.

The grand champion carload at Los Angeles was fitted by a young chap who is primarily a market feeder. The only difference was this. He selected the calves a little more carefully for type and uniformity, and because he knew that more finish was required to win in the show ring than the regular market demanded, he used one or two feeds in addition to his regular ration, and he did not try to hurry them along too fast. That was the only difference. If you will write the following statement where you can see it every day when you feed your steers, it will perhaps help you avoid the most general mistake I have seen in steer projects, that is, the tendency to grow them but not get them fat.

Here it is. When rapid gains are desired on baby beef and high condition rather than gross weight is important, the hay should not be more than one-third the weight of the grain ration.

SHEEP

The month of December is quite a busy one for those who produce early lambs. If your ewes were bred early, around July 4, you should have your lambing pens clean and completely equipped now. Of course, if you have good pasture, that is the place for the ewes in the daytime, if the weather is good. However, you should see them as often as your school work will permit. In anticipation of trouble you should have learned before this what to do. If the lamb is all right at birth, dry him with a barley sack and especially clean out his mouth. Give him an hour in which to nurse; if he is too weak to do so, hold him up and strip some milk into his mouth.

Some shepherds tie the navel cord with a piere of disinfected twine. I prefer just to dip the cord in iodine. Watch out for constipation. Have some castor oil ready, a tablespoonful is generally enough for a young lamb. If scours develop, change or reduce the ewe's feed and clean the quarters thoroughly, or if possible, move to other quarters. By the time the lambs are two weeks old, cut the tails off, and castrate the ram lambs that are to be sent to the butcher.

Put them in a clean, deeply bedded stall for a couple of hours afterwards, or until you are sure all bleeding has stopped. Then, if you can, get them out to fresh, clean pasture at once. If this cannot be done, keep the pens clean and well bedded until all of the wounds are thoroughly healed.

Try to handle the ewes in such a way that they will increase their milk flow as fast as the lambs can handle it, but no faster. Present indications are that the market for early lambs will be good, but the lambs must be good to bring the top price.

HOGS

While the market price of hogs has improved slightly, the price of feeds is proportionately higher. So, you need to be careful about your rations. Use some cheap feeds whenever you can, but be sure they are cheaper in the returns they will produce, not just cheaper in cost per hundred pounds. Why is it important that sows be carefully fed during this month and through January and February, if they are to produce a spring litter in March?

Here is the reason. You want a good-sized litter of strong, husky pigs that will grow rapidly and economically to market weight. The feeding of the sow for the next three months has a lot to do with these things. It's too late now to change the number in the litter, if one month of the gestation period has passed. But what you do in the next three months can have much to do with the number of pigs that can be saved at birth and carried to market weight rapidly.

Have you seen quite large litters farrowed when the pigs were small and skinny, and several of them would squawk like a duck? Nine out of ten times, this was the result of improper feeding and lack of exercise taken by the sow. Oftentimes these little chaps that weigh perhaps 1¼ to 1½ pounds are so weak they fail to get out of the mother's way, and she kills most of them during the first week. The sow is condemned as being a poor mother, when perhaps most of the blame should be charged to the chap who fed her. In the end you may be just as well off financially because these small, weak pigs were killed early, for seldom do they grow as economically as the strong, husky ones that weigh from 2.2 pounds to 2.4 pounds at birth.

Improper feeding now may also mean an inadequate supply of milk for the new pigs. If they do not start well, they seldom regain the lost ground, and even if they make it up after weaning, they do so at a considerably greater cost. So, while vacation time is scheduled for the latter part of this month, do not take a complete vacation from the hog pens during that time, if you hope to be listed among the top performers in hog projects next spring.

Santa Claus is a grand old chap, but he has a full-time job distributing presents and you should not count on him to feed your hogs in addition to his other work.

J. I. Thompson.

Forty new members taken into the Modesto chapter at a recent meeting bring the membership up to 133, and this chapter is closely pressing for first rank in numbers in the state. Of the total membership, 101 are Greenhands, 29 are Junior Farmers and three are State Farmers. Levoy Wright was chairman of the informal initiation, with the degree team composed of Harold Schmidt, president; Ralph Hanchett, acting vice-president; Wendell Page, secretary; Clayton Jones, reporter; Clifford Bauman, reporter, and J. E. Walker, adviser. Wilfred Weaver was in charge of the refreshment committee.

Members of the Santa Rosa national championship dairy cattle judging team are becoming "meeting conscious." In the last few weeks, the boys have attended the Western Regional Dairy conference banquet in connection with the Pacific Slope show at Oakland, a meeting of the California Dairy Council, the local Kiwanis, Rotary and Chamber of Commerce meetings, three Grange sessions, two Farm Bureau gatherings and one meeting of the Farmers Union.

The Napa chapter has undertaken a school project to build a "Block N" on the side of Mt. George, overlooking the football field.

Tramp Athlete

. . . A TWO-PART SERIAL . . .

CONCLUSION

Coach Jesse dazedly hung up the receiver. The fact that the star Chatwood high fullback was gone became completely dwarfed by the knowledge that someone was deliberately attempting to get him out of the way before the Millford game three days away.

The grid coach sat down aimlessly, filling his pipe. A list of all the persons who could benefit by Tex Rogers' absence from the game included the whole community of Millford, the vague gambling element which he knew would "fix" the contest in a minute if it could; Rogers' parents, and—Russell Jones.

Chapman felt ashamed of himself for even his mental inclusion of Russ in the list, and yet there was every evidence that *someone* had lied to get Rogers out of town. But—wait—if the telegram was a fraud, why not catch the southern boy on the train and explain the fake message.

Berating his stupidity, the coach jerked out his watch. The train would not yet have reached the terminal city where it would be necessary to change trains to go south. He called Hank Spurlin at the telegraph office again.

"Get this off to eastbound train No. 82, care of the conductor: 'Wilbur Rogers passenger your train en route Beaudoin, Texas. Telegram calling him home fraudulent. Advise him return Chatwood immediately. Wire collect if you do not locate.' Now, Hank, rush this through and call me."

The algebra papers were dumped to a corner of the table as the coach's mind whirled through the events of the evening. The fact that the telegram to Rogers had been sent from the Texas town—Hank was sure of that—indicated that the trick had been planned in advance. Coach Jesse mentally checked the rival coach, faculty or student body off the list. Not only would such a piece of skullduggery be too rotten to live down, but, he concluded whimsically, nobody in the whole outfit over at Millford had brains enough to even think up such a plan. No, they were probably "out."

Of the gambling element, the football tutor knew little. He had heard rumors that big sums were being wagered on his team. It had worried him somewhat, but as there was nothing he could do about it, he did not let the fact cause any loss of sleep. He knew, of course, that the railbirds who lounged about the field during practice were not entirely interested spectators; but were bright-eyed boys ready to hurry off to headquarters with any "inside dope" on new plays, players or injuries which might change the Chatwood chances.

If this furtive fraternity had attempted to get Rogers away for the crucial game, its members were more likely to be residents of Millford or even some neutral city, than of Chatwood. A local man who changed backing over-night would immediately be under suspicion. The matter would bear investigation, but it would have to wait.

He stared at the telephone as if attempting to draw a solution from it. The third probability—Rogers' parents—bobbed into mind. Suppose they had really sent the telegram to get Wilbur home but after being sure he had started, denied its authorship. Who was Ray? The name had apparently meant something to Tex.

The fact that he and Mrs. Chapman had been out that evening formed another coincidental link, for they seldom were away from home. Had they been present when Rogers came, the coach would have had an opportunity to check on the authenticity of the message then. How could the culprit know that on Wednesday evening, the Chapmans would be going out to dinner—know it in time to arrange to have a telegram sent from far-off Texas. Why—"Doc" Esson had called them only that noon. This might be a lead—

He checked with the telegraph office, found that his message had been handed the conductor on train 82 just as the train pulled out of South Junction, and that there would be no opportunity for an answer in less than a half-hour. The phone would be free. Chapman called the local dentist.

"Say, Tom, I'm trying to check up on some funny doings—too complicated to explain just now. But, anyhow, did you tell anybody before you called Dora up this noon, that you were going to invite us over for dinner tonight?"

There was a moment of noticeably embarrassed silence, and then, "Why—er—ah, as a mater of fact, Jess, I hadn't thought of asking you over until you called me." This was quickly followed by the very obvious, "Of course, we were tickled that you could come."

Chapman passed a hand across his forehead. This was getting a bit too thick.

"Wait up, Tom. One of us is balmy—maybe both of us. You said *I* called *you?*"

"Sure you did, old absent-minded. Don't you remember—let me see—you said it was your wife's birthday. Then I asked you what you were going to do, and you said 'nothing much.' I said, 'Why not come over for dinner,' and you said, 'We'll do it.' And then you asked me to call your wife and invite you both over as if it was all a surprise. And that's just what I did."

Coach Jesse set his teeth. "Tom, I never called you. Somebody has been impersonating me. Did it sound like my voice?"

"Well—er—no. Now that you mention it, it didn't exactly. But I didn't pay much attention."

"Now you *know* that it wasn't, can you think who it *did* sound like?"

The dentist pondered. "Hard to say, Jesse. Sounded sorta younger than you, I guess."

The coach wondered just how much to reveal. "Did it—did it sound like any of my football players?"

Esson laughed. "What's the matter—some of the boys playing a prank on you?" Then, before Chapman could reply, he added, "If I had to pick out one fellow or the other, I'd say it sounded like Russ Jones."

The coach felt suddenly sick and giddy. "Thanks, Tom," he muttered. "Don't say a word about this to anybody." He hung up the phone.

"Dora," calling to Mrs. Chapman. "Who all around town knows that your birthday is today?"

His wife had just come into the room, and had heard none of the previous conversation. She paused reflectively, too used to her husband's spontaneous questions to be startled.

"Well, all the girls in our bridge club do. And lots of folks in the church—you know, we still have birthday offerings. And there's—well, Mrs. Jones, Russell's mother—because her birthday is the same as mine. And there's—"

"That's enough," said the coach, grimly, moving toward the phone which had tinkled again.

It was the telegram from the train conductor and read, "Know Rogers by sight. He got off train at Millford and did not get back on."

* * *

Thursday morning's classes rolled by Chapman in dreary succession. Every lead sent out by the coach had proved worthless. Police at Millford had no report on anyone resembling Rogers. If gambling elements had kidnaped Tex Rogers by getting him to leave the train there, they had failed to capitalize on it, for such a "coup" would have to be acted on quickly before news got around, and there was no such activity. The absence of the fullback was commented on at school, and soon rumors spread that he had "skipped."

Coach Jesse was too bewildered to even think clearly, and he was dull from loss of sleep. He tried to examine Russell Jones without attracting suspicion, watching the big youngster between periods in the hallway, and during the one class Jones had under Chapman. But if the local boy had a guilty conscience, he was covering it perfectly. With only vague suspicion, the coach did not attempt to broach the mattert to Jones, nor to school authorities.

At football practice that afternoon, the coach assembled the entire squad.

"Fellows, Tex Rogers won't be with us Saturday. There are plenty of rumors as to what's happened to him. Don't pay any attention to any of them—we'll find out in due time. We've got to rebuild everything around Russ as fullback. It won't be hard— Russ can pull us through in fine shape. Now, you blocking backs will have to change your timing a little, and our punts won't go down the field quite so far, so we'll have to run their's back that much farther. Now—let's go!"

The Millford game was another classic of prep school football. Three times in the first half, Chatwood had the ball

in scoring territory, and each time Millford rose up to stave off the attack. Chatwood had the wind in its face the third quarter, and while the team gained consistently in scrimmage play, it was forced back time after time in the exchange of punts.

The fourth quarter started with the ball in Chatwood's possession on its own 32-yard line. Quarterback Knapp, realizing that time was too short now to play for the breaks on the exchange of kicks, sent Russ smashing into the line. Three yards, four yards, five yards and a first down on the 44. Then came a neat pass which gave Chatwood a first down on Millford's 35.

Here came the play which turned the tide. Jones faded back to pass, but every receiver was covered. Tucking the ball under his arm, he sprinted toward the left. The Millford line had been pulled in on the expected pass and the backs were scattered. With a beautiful piece of straight-arming, spinning, and dodging, Russ broke through and went over the line standing up. His attempted kick was wide, and a Millford player, coming in to block, knocked him sprawling. As his head hit the turf, the light faded before his eyes. . . .

When he came home from the hospital next day, fully recovered from what was described as a "slight concussion," the fullback drank in the newspaper account of the game. The local reporter had outdone himself.

"With the championship almost 'in the bag,' " the story concluded, "the Chatwood team rose to glorious heights as its great fullback was carried from the field. Harry Hoskins, sub half, was shifted to the fullback position and while he failed by far to fill the shoes of the injured boy, the superb work of his team-mates protected the six-point lead until the gun sounded."

On Monday afternoon, Chapman asked Jones how he felt. The two were alone at the coach's desk.

"Feeling fine, Coach. But—I certainly was out cold when I went to the hospital.

"They gave me something to put me to sleep, and I haven't though much about it until today, but darned if I couldn't swear that Tex Rogers was bending over my bed in the hospital."

The coach laughed. "You got a worse bump than I thought. He's probably a thousand miles away by now."

The boy started to say something, and then checked himself. Chapman turned to get some papers and the subject was dropped.

On the same Saturday on which the Chatwood-Millford game was played, the Sprague high school had won the championship in the adjoining state and the decks were cleared for the inter-state competition. There was no point for comparison between Chatwood and Sprague—both had gone through the season undefeated, and both had a galaxy of stars.

The loss of Tex Rogers to the team was only history with the victory over Millford. Coach Jesse worked the team lightly, fearful of injuries and feeling that nothing could be gained now by hard scrimmage. He was as much in the dark as ever over Tex's disappearance, and with Jones going great guns, he had put it out of his mind until after the season was over.

The game was played with Sprague in a border city, and it seemed as if the entire population of both states wanted to get into the stadium. Long before game time, "standing room only" signs were posted, and spectators fairly overflowed onto the field when the opening whistle blew.

The contest was a fiercely-fought battle. Both coaches had drilled thoroughly in fundamentals. Backfields were alert on pass defense, and the two lines were almost a stand-off. In the second quarter, Sprague carved three points with a sensational and lucky place-kick from the 30-yard line.

In the third quarter, Chatwood launched a vicious attack. Jones and the left half-back, Woodson, alternately pounded off tackle and skirted the ends. The drive took the ball down to Sprague's four-yard line where every thrust was repelled and the opponents took the ball on downs.

With a prayer in his throat, the Sprague quarterback booted the ball out, and Knapp took it on the 35-yard line. He wormed and twisted back fifteen yards as the gun closed the quarter. The teams reversed to the other end of the field. Coach Jesse sat on the bench, chewing a straw. Football was to him a game in which the coach taught the basic principles and the players did the thinking. He did not often send in a substitute with instructions, or signal from the bench, preferring to let the quarterback figure out his best plan of attack from his knowledge of the weaknesses found in actual combat.

In the opening play of the fourth quarter, the coach's faith was justified. Teddy Knapp had noticed that the Sprague left guard was "woozy," and he sent a spinner play through that side for a first down on the 8-yard line. Here two plays netted only three yards, and then Coach Jesse groaned as he saw Jones dropping back for a place-kick. The best they could get would be a tie!

He jumped frantically to his feet shouting for a substitute end when the play started. It was a perfect fake—Knapp simulating catching the ball, and Jones lurching forward—but wait—there was the ball in Woodson's arms, the halfback skirting the end with every Sprague man concentrated on rushing the supposed kicker. The Chatwood boy was over the line with the ball before he was even detected. The try for point was good and the score was 7-3—and there it ended. Sprague's concentration on Jones had cost them the game, but the glory belonged to the big fullback.

* * *

Coach Chapman hurried home immediately after the game. turning the team over to an assistant for an evening banquet and celebration. Mrs. Chapman was in Chatwood hospital for a minor operation, and the coach went directly to the institution from the train.

A basement door was directly beside the main entrance, and Chapman noticed a figure with a familiar step coming out with a satchel in hand. He paused a moment, and then said, "It's you, isn't it, Tex?"

The startled boy turned as if to run, but Chapman caught his arm. The youth relaxed and said, "I thought you were at Portsmouth—I saw you there from the grandstand three hours ago."

"Never mind where you thought I was. I'm going to clear up a lot of mysteries right now. I take it you're working here?"

"I was. Quit tonight. But I've still got a room in the basement, if you want to talk"

The coach said, "I guess my wife can wait." Rogers led the way back into the furnace room, turned on a dim light, pushed up a chair for the coach and squatted on the bunk.

"Tell me what you already know, and I'll fill in the gaps," said the boy, grinning in spite of Chapman's tenseness. The coach quickly went through his discoveries.

"Now, tell your story, and tell *everything,*" he said grimly.

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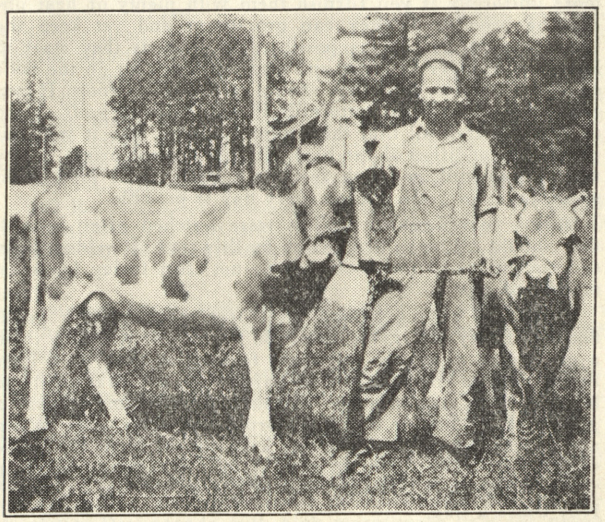
STAR AMERICAN FARMER, 1934



Paul Astleford, Newburg, Oregon, America's 1934 Star Farmer. Like many California boys who are pressing closely on Paul's record, the Oregon Future Farmer started with dairy cattle and supplemental crops. The bib overalls—and do we detect a hole in the knee—show that this young man went to the top by the only successful method—hard work.

This Month in Poultry Projects

Although it was predicted that the egg market would remain very strong until late in December, it seems that there was considerable buying resistance on the part of consumers in the east when fresh Pacific Coast eggs were selling for 50c to 60c per dozen. When the market once broke and started to go down it was continually forced lower until it arrived at a point where consumption began to improve. The drop in the New York market showed an immediate effect on Pacific Coast markets. At the present time there are less eggs in storage both on the Pacific Coast and in the entire United States than last year. The receipts are also somewhat lower than a year ago. Our price outlook in California depends to a great extent on how well consumption maintains a high level.

A few weeks before the Thanksgiving market on turkeys, it was feared that there would be a very large over-supply brought into the cities. The tendency has been in the last few years for the producers to feed high protein and other rapid growing foods as well as to practice early hatching, so that a larger per cent of the turkey crop has been brought in on the Thanksgiving market. This practice has had a tendency to lower the price and weaken the market conditions for this holidy because in most cases, the turkeys are not mature enough to be held over as "freezer" stock. Those of you who have turkeys for sale should not be anxious to sell them before they are well matured and in good condition even if it is necessary to hold them over until after Christmas.

If you have a meat-bird brooding project it is a good plan to keep the chix growing rapidly from now on so that they may make not only an efficient gain but have the birds ready for the market during the high-priced spring months. If your ration is balanced otherwise, a 20 per cent protein mash will not be too high after your chix are eight weeks of age. It is always a good plan to feed the chix all of the scratch grain that they will clean up just before roosting time, after they are well started. One of the common problems with heavy chix is that a large proportion of them, especially in Rhode Island Reds, become bare-backs. It is not known definitely just what causes this condition but crowding in the corners and sweating seems to make it more prevalent. Your chix will develop feathering more rapidly and will grow more uniformly if you furnish them with plenty of heat under the brooder so they can get warm and yet keep the brooder room as cool as possible. As soon as they start to leave the brooder at night and start to bunch up on the floor or in the corners, then they should be taught to roost. If you can get skim milk or buttermilk it will cheapen your ration to give the chix all that they want to drink, also it will improve the condition of the birds. At the present prices of dry milk, liquid milk is worth 3c to 4c a gallon as a food. Feed some source of fresh greens every day if possible.

Unless your Leghorn pullets were hatched after June 1, they should all be in production by this time. It seldom pays to keep pullets in the flock that do not start to lay by seven months of age.

If you are having trouble with neck molts in your pullet flock or if they are laying below 50 per cent it will help them a great deal to give a wet mash feeding at noon or a little liquid milk to drink. You can safely use artificial lights to lengthen their day to about 14 hours. At this time of year a great deal of money is lost by producing dirty eggs. When the weather is wet it is best to keep the birds in the house so that they do not track in mud. Also it is necessary to clean the house more frequently and to gather the eggs three or four times a day.

Check through your flock and be sure that you are not expecting the birds to produce efficiently and at the same time feed lice, mites, or intestinal worms. If any of these are present in your flock, use one of the recommended methods of treatment.

Richard I. Leach.

LOS ANGELES PROGRAM ATTRACTS HUNDREDS FROM ALL OVER STATE

Despite the changes in show dates which took the Great Western Livestock educational program out of the usual Thanksgiving vacation period, approximately 600 Future Farmers from 59 high schools in 30 California counties, took part in the two-day event.

In the major competition of the program, the statewide public speaking contest sponsored by the stock show management, Shirley Jones, 16-year-old Madera high school junior agriculture boy, won first place and the $25 award with his talk on "Our Changing Livestock Industry." Jones represented the San Joaquin valley region.

Second place went to Scott Shaw, representative of the Central region, from the San Juan Union high at Fair Oaks. The Sacramento valley finalist, Daryl Van Dyke of East Nicolaus high, placed third. Roy Parks of Tomales high, defending the honors for the Redwood Empire region, took fourth. Bob Hoyt, Chino Vocational student and Southern title holder, was fifth and Robert Whipple, Centerville high schooler and representative of the South Coast, was sixth.

The public speaking contest was an event of the opening morning's program on Friday. Immediately after the first assembly, the Future Farmers inspected the Cudahy Packing company's plant, and wrote essays on factors which most impressed them. The ten high students, each the best from his school, received hams as prizes. The winners were Leonard Frame, Laton; Tom Stevens, Ceres; Jean Veliquette, El Centro; Frank Espinola, Manteca; Robert Mottner, Simi; Don Gardner, Garden Grove; Wilfred Smith, Grossmont; Elmer Tate, Chaffey; Herbert Foth, Madera, and Ted Canham, Riverside.

During the first morning, rain began, and continued in varying degrees of "wetness' throughout both days. The afternoon program of the opening day centered around a trip to the Universal motion picture studios. With the lot a sprinkle of water, studio officials opened an interior set to the 400 boys and invited them in to watch the filming of a portion of a western picture. It was a real treat to those unacquainted with the motion picture industry.

Later in the afternoon, Mayor Frank L. Shaw greeted the visitors in his office at the Los Angeles city hall, and many boys took advantage of special arrangements for them to

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The statewide public speaking contestants at the Great Western program. Front row, from the left, Bob Whipple, Centerville; Shirley Jones, Madera, winner of the contest; Daryl Van Dyke, East Nicolaus. Back row, from the left, Scott Shaw, San Juan high, Fair Oaks; Roy Parks, Tomales; Bob Hoyt, Chino Vocational.

THIS MONTH WITH PROJECT RECORD BOOKS

MAKING PROJECT PLANS

Your instructors tell me that project planning is a hard job for you Future Farmers. Probably you have already started making plans for your project work and have found this out. Well, there is supposed to be one unfailing way to make a hard job into an easy one. That is to *break it up into a bunch of smaller jobs.* Let's see whether we can do this with our project plans.

The first and perhaps most important part of the plan is the budget; an estimate of the probable receipts and expenses of the project. There are two very good reasons for spending considerable time in preparing as close an estimate as you can of your expenses and profits. First, even though you may have selected a project which you would like to carry, your estimate may show that you haven't a chance to make a profit and that you would lose money by going through with your first selection. Second, even though there may be a possible profit coming to you, your estimate may show that the project expenses amount to a larger sum of money than you can secure. Many projects that started out like a "million dollars" have failed simply because some boy didn't have enough money to buy sufficient feed for his stock or poultry.

It is far better, and certainly costs less, to find these things out before the project is started, and these are the main reasons why your teacher asks you to make a budget estimate in your record book.

Since it is true that you probably have no way of knowing or checking up on your estimates to see whether they are accurate, below are some figures which may help you. The first table gives the average production costs, figured on a one-acre basis for field, fruit and truck crops most commonly raised by pupils in project work.

One Acre of—	*Pre-harvest costs.*	*Harvesting costs.*	*Misc. costs.*	*Total per acre.*	*Per unit.*
Barley, dry land	$ 3.10	$ 4.94	$ 1.53	$ 9.58	$ .64 per cwt.
Beans, lima; irrigation by pumping	22.76	21.50	2.56	46.82	2.17 " cwt.
Alfalfa hay (gravity irrigation)	$41.58		9.51	51.09	8.52 " ton
Bermuda onions	55.75	103.21	.71	159.67	.64 " cwt.
Potatoes (San Joaquin)	66.85	32.89	.71	100.45	.80 " cwt.
Potatoes (Salinas)	33.16	46.22	2.28	81.66	.55 " cwt.
Grain Sorghum	10.57	10.40	6.74	27.71	1.11 " cwt.
Almonds	23.44	51.82	14.28	89.54	.089 " lb.
Apricots (canning)	71.21	41.28	27.04	139.53	23.29 " ton
Apricots (dried)	71.21	98.07	46.29	215.57	.069 " lb.
Apricots (shipping)	44.26	184.98	22.78	252.02	.63 " crate
Juice grapes	21.72	96.00	9.90	127.62	15.95 " ton
Table grapes	19.82	33.95	10.45	64.22	8.03 " ton
Raisin (Thompson)	27.97	23.08	48.75	99.80	.033 " lb.
Pears (canning or shipping)	64.00	39.38	20.02	123.40	15.41 " ton
Prunes	52.33	58.01	53.62	163.96	.027 " lb.
Cantaloupes (San Joaquin)	30.47	100.00	4.88	135.35	.54 " crate
Lettuce (Monterey spring crop)	33.16	123.45	2.16	158.77	1.27 " crate
Lettuce (Monterey fall crop)	33.40	173.25	1.86	208.51	1.19 " crate

The above figures are taken from "Farm Management Crop Manual" by Adams and Crawford, and represent *average* costs in California by farmers using efficient production and marketing methods. Your estimates may not agree with these and still be correct, but if your estimates of costs are *larger* than those listed above, you may get into trouble.

For those of you who are planning livestock and poultry projects, the following figures may give you a standard with which to check your own estimates. These figures are taken from project budget estimates that have proved to be quite accurate in comparison with actual results:

Project.	*Labor.*	*Feed.*	*Total Expense.*
*Sheep (10 grade ewes)	60 hrs.	$2.50 per head	$ 56.80
Show lambs (8 head)	45 hrs.	300 lbs. alfalfa, 300 lbs. barley, 50 lbs. linseed meal, 300 pounds alfalfa meal, pasture	60.25
Turkeys (50 poults)	60 hrs.	3,500 lbs.	113.55
*Egg production (100 hens)	160 hrs.	4500 lbs. mash, 4500 lbs. grain	256.65
Brooding (200 chicks)	60 hrs.	1150 lbs. mash, 1150 lbs. scratch	96.43
Brooding (450 meat birds)	100 hrs.	Chick mash 1000 lbs., growing mash 3300 lbs., scratch 700 lbs., growing scratch 3500 lbs., rice polish 500 lbs.	290.35
*Dairy cow (milk production)	300 hrs.	5 tons alfalfa, 1½ tons grain, pasture 6 months	176.50
*Rabbits (1 doe—3 litters)	7 hrs.	130 lbs. hay, 20 lbs. grain	4.85

*Does not include cost of foundation stock.

The total expense in the above estimates includes depreciation, interest, use of buildings and equipment, and other miscellaneous charges in addition to labor and feed costs. Remember that these figures are estimates and not to be taken as actual costs. However, they have proved to be not too far from actual results.

One final word of advice in making your budget estimates. *Be a pessimist.* If you must make mistakes in your estimates, and you probably will, figure your expenses too high and your income too low. "Blessed is he who expecteth nothing, for he shall not be disappointed."

S. S. Sutherland.

Vacaville chapter has rented 15 acres of apricot and peach orchard for a chapter cooperative project. The operation will be financed through the federal production credit funds. Other reports from this chapter tell of a refreshment stand at football games for treasury funds; ordering of 2300 Barred Rock chicks for meat bird projects; and that eleven chapter members are on the school's championship football team.

Lowell Edington, American Farmer member of the Napa chapter, was a recent meeting speaker.

Newman chapter activities include a Greenhand initiation for 19 new members, with Principal Oliver E. Brown as a special guest; and construction of a chapter float in the Armistice Day parade with high compliment paid the group for their artistry.

Patterson chapter has a new publication known as the Ag Room BULL-etin. Thus far it has only reached the bulletin board, but hopes are high for eventually distributing it among members and farmers in the community.

Milkstool Suggestions for December

THE FEED SITUATION

There are some bright spots appearing on the dairy horizon but the price of feeds is not one of them. Feed prices are higher in comparison with the price of dairy products than any time since 1911. The severe drought in the middle west is the principal cause of this. However, California dairymen have been fortunate in getting early fall rains and very favorable weather. This means early, cheap feed to many farmers.

However, the high price of feeds that must be purchased makes it very important to utilize home-grown feeds to the fullest extent. Winter pastures such as rye or barley should be sown now. In many instances such pastures can be used and native pastures given a rest so that they can mature and be used later during the dry season.

It looks as though next year is going to be a good time in which to use silos as much as possible. With hay and succulent feeds such as beet pulp high in price, nutrients can probably be produced in the form of silage at a lower cost. It is possible to put three different crops in the same silo during one year. Early in the spring some dairymen will have oats and vetch that make excellent silage. Corn can be planted early and put in the silo about August. Honey sorghum can be used to a larger extent in California. It can usually be planted about the first of April and harvested in October or even as late as November. This is a drought-resistant crop and a fair yield can be obtained without irrigation. It does fairly well on upland. Trench silos are worth considering if others are not available.

Last year a farmer in the Los Angeles area used a novel and perhaps new method of handling a crop of wild oats. He got this at a very low cost. The crop was cut in the dough stage. A shallow trench was scraped out about fifteen feet wide and thirty feet long. The green oats was stacked to a height of 8 or 10 feet in this trench and covered with about a foot of the soil that was scraped out of the trench. This preserved the oats with the exception of a very thin layer on the outside. It was uncovered as fed and proved to be a very palatable and nutritious feed that gave no off-flavors to the milk. This is an idea that might be used by others for feed conservation.

Alfalfa is unexcelled as a dairy cattle hay. There are some sections in California where it is economical to raise more alfalfa even though only enough water is available for about three irrigations. If under these conditions about four cuttings can be obtained, cheaper feed can be produced than by competing annual crops. Alfalfa will stand considerable drought and still survive.

PRODUCTION RECORDS

With feed prices mounting, it is quite important to cull unprofitable producers. This cannot be done without production records. Every dairyman should arrange to obtain these in some manner. Cow testing associations, private, school and official tests offer numerous possibilities.

The chief object of production records should be to provide information which will make it possible to locate and use good sires. All production records should be carefully analyzed if full benefits are to be obtained. If sires are not transmitting high production, they should be discarded and proved ones obtained.

If this is not possible, sons of proved sires should be used. They can now be obtained at very reasonable cost. The young ones should be proved as early as possible in order to know whether to continue their use. This can only be done by consistently testing for production.

RAISING CALVES

If you have a high-quality herd, it is going to pay to raise good heifer calves. Prices are going up on good dairy cattle that are free from disease. Slaughter in the drought areas and tuberculosis and abortion elimination in other sections is going to make good cattle in demand. Heaviest calf losses occur in the fall and early winter. Calf pneumonia is more common because of the great variation in temperature between day and night. Calves should be housed in barns that are free from drafts. If too many are dying from colds or pneumonia, consult a competent veterinarian. He may prescribe a good bacterin to build up immunity.

George M. Drumm.

FUTURE FARMERS SHOW GOOD LIVESTOCK AT GREAT WESTERN

With good quality of stock shown, Future Farmers provided plenty of competition among themselves and with adult breeders in the junior and open divisions of the Great Western Livestock show at Los Angeles.

In the Future Farmer division, Russell Bell of Woodland had champion steer, an Angus. Other breed champions were a Hereford shown by John Marsac of Healdsburg and a Shorthorn by Dismo Marre of Santa Ynez. Claire Winterton's 4-H club steer from Charleston, Utah, was grand champion of the junior division.

In swine, Henry Zipser's Hampshire barrow was champion of the Future Farmer division and grand champion of the junior show, winning from his sister's 4-H club entry. Zipser took first in Hampshires, Alex Benjestorf of Norwalk first in Chesters, Earl Bunting of Chino first in Durocs. Elwin Hawes of San Bernardino first in Polands, Reldon Dunlap of Chino first in grade or crossbreds, Zipser first in pens of all breeds. Dunlap was first in swine showmanship, Bunting second, Benjestorf third, Hawes fourth and Dennis Grigsby of Porterville fifth.

Albert Richardson of Bakersfield, with a Southdown lamb, won the Future Farmer championship, but Peter Motta, University farm 4-H club member, took the grand championship. Tony Delfino of Bakersfield won with Suffolks, Arthur Nutt of Bakersfield with Shropshires, Richardson with grade or crossbreds, and Nutt with pen entry. John Park, Bakersfield, won sheep showmanship, Nutt was second, Delfino third and Richardson fourth.

Beef showmanship awards went to Bell first, Marsac second and John Hayes of Bakersfield third.

Future Farmers furnished plenty of competition in the open show. Former junior exhibitors, both Future Farmers and club members, made up most of the open swine show. The California Polytechnic students, showing only in the open, took some awards in all classes entered but no championships.

The Fallbrook chapter has constructed a complete set of Future Farmer stations for business meetings and initiations. The desks are painted in blue and gold, with the organization's initials across the front. The group also has one of the best-trained initiation teams in the state, according to reports. Recently the boys initiated 29 Greenhands at San Juan Capistrano. George Gale of Fallbrook gave the creed and the chapter band from this school played selections. Speakers included Regional Adviser E. W. Everett. the Fallbrook chapter adviser, Karl Winkenhoffer, and the San Juan Capistrano adviser, J. J. Lillard. The "Caps" took the "Brooks" in two basketball games. The principal and two board members were also initiated.

The East Nicolaus chapter is editing a Future Farmer paper this year, which goes to active and alumni members, and farmers in the community. One of the most valuable features of the paper is a column of answers to questions sent in by farmers in the district. Advertising from local firms supports the publication. Daryl Van Dyke is editor, Joe Compton assistant editor, Ernest Rudin circulation manager and field man, Lassaro Dominguez chief reporter, Orlin Van Dyke business manager, and Bill Coupe printer and cartoonist. Faculty advisers are Virgil R. Lance and E. F. McCarthy, the latter cadet teacher.

The Modesto chapter is emphasizing the Junior Farmer degree in the night meetings being held. One month, the meeting is general, and the next month for Junior Farmers only. It is hoped to thus encourage more Greenhands to qualify for this degree. Several will be ready for initiation in December.

National Cheese week was duly recognized at Turlock. The visitors at open house held during this week were each given a generous slice from the product of the local factory.

SUPERIOR BOYS MEET

One of the highlights of the Sacramento valley regional Future Farmer meeting at Chico was the decision to adopt some uniformity in the awarding of high school Future Farmer letters. It was decided that the points be made up from projects, judging, exhibiting at fairs, scholarship, public speaking, athletics, school and community leadership, agricultural mechanics ability and farm skills. A boy must have points in at least three of these to qualify for a letter. Weight given each point was left to individual schools. A basketball schedule was adopted. In the election of officers, Charles Montinelli of Chico was named regional president, Robert Liddell of Red Bluff vice-president and Clayton Hill of Red Bluff secretary. The basketball schedule will be handled by the regional adviser, A. G. Rinn, of Chico.

EL CENTRO CHAPTER AIDS CITY, OWN TREASURY, WITH TREE PLOT

The Future Farmer chapter in the Central Union high school at El Centro is carrying on a project which is proving very much worth while both as a community service activity and also from a financial standpoint. This project is the growing of palo verde trees to be used in a tree-planting campaign in El Centro.

Last May just before the close of school, the chapter was approached by Bob Hays, the secretary of the local chamber of commerce with a proposition that the chamber would purchase from the F. F. A. chapter at 10 cents each, all palo verde trees which the boys were able to grow during the school year 1934-35. The nursery beds were prepared by the boys and the seeds planted the last week in May.

In spite of a very severe drought which occurred and still exists in the Imperial valley, these trees have done unusually well as they now range from four to seven feet in height. The drought had previously caused the death of hundreds of pepper and other shade trees in El Centro. Under present arrangements the chamber of commerce is purchasing 450 trees from the chapter to donate to the city. These trees are being planted along the curbing of the city to replace those which died this past summer. In addition, the chamber is selling at 10 cents each the remainder of the palo verde trees to anyone in town wishing to purchase them for the beautification of his home.

The campaign to plant palo verde trees in El Centro was started about two years ago when the chamber bought a few trees which had been grown by a high school boy. This campaign was frowned upon by a local nurseryman as he felt it would cut into his business, but he has since found and admitted that the interest in home beautification created by the palo verde tree campaign has been a big boon to his business, as it has enabled him to sell a great many ornamentals which he otherwise could not have disposed of.

It looks as if the present supply of 1500 trees will soon be disposed of so the boys are getting to work immediately and planting more trees which will be offered for sale next spring. The project will net the chapter treasury almost $150.

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visit the tower. The evening period was given over to a visit to Radio Station KHJ or such other entertainment as the boys desired.

With the show opening Saturday morning, the entire group spent this period looking over the exhibits, watching the judging of Future Farmer stock in the junior division, and taking part in a weight-estimating and dressing per cent guessing contest. Prizes amounting to $25 were given by Swift and Co. Robert Morris of Selma was highest in the contest, followed in order by Anthony Silva of Centerville, Howard Utman and Robert Groff of Chaffey, Ogden Butcher of Riverside, Blythe Rosenberger of Chaffey, Joe Gomes of Madera, John Franklin of Chaffey, James McDougald and Rudolph Lundstrom of Madera and Emil Fietz of Chaffey.

The afternoon will be remembered as a "wet affair." Members attended either the stock show rodeo or the U. S. C.-University of Oregon football game, with plenty of rain at either place. In spite of the thorough soaking, more than 350 were present at the evening banquet in the Tower building near the stock show.

The affair, given by the show management to the Future Farmers of America, was presided over by Robert Wilson, director of the agriculture department of the California State Chamber of Commerce, as toastmaster.

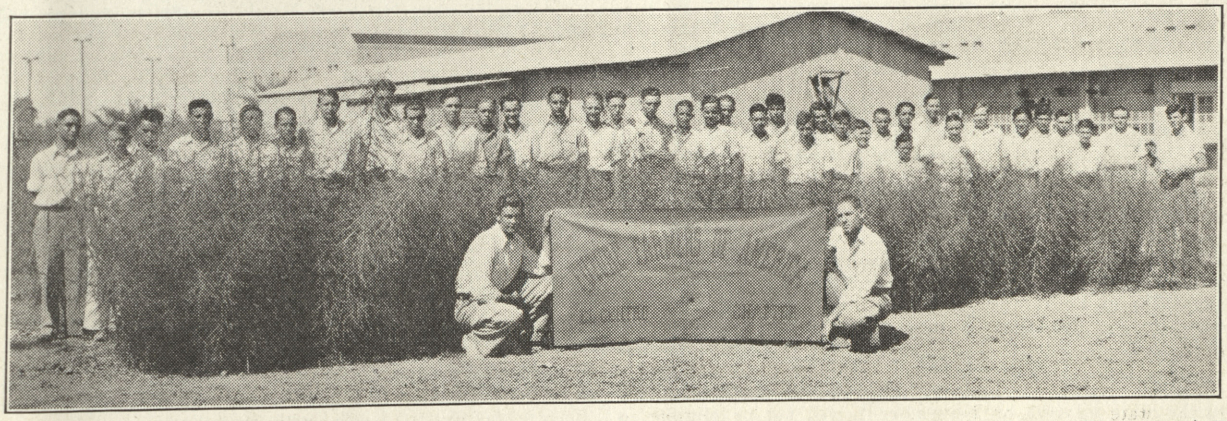
The speakers' list included Otto V. Battles of Yakima, Wash., president of the American Aberdeen-Angus Breeders' association; Herbert Chandler of Baker, Ore., president of the American Hereford association; J. A. McNaughton, president of the show and manager of the Los Angeles stockyards; Julian A. McPhee, chief of the state bureau of agricultural education; Joseph Spina, president of the California Association of Future Farmers of America; Nelson Crow, editor of the Western Livestock Journal, and Gerald Fitzgerald of the May company, representing the Downtown Businessmen's association.

The Cudahy awards were presented by Lloyd Burkholder of that firm and the Swift prizes by H. A. McDougal. L. M. Yerkes, secretary of the agriculture department of the Los Angeles Chamber of Commerce and who acted with McDougal as judges in the public speaking contest, was also present.

San Bernardino chapter furnished a yell-leader for the evening. Because of inclement weather, time of train departures and other causes, many Future Farmers were forced to leave before the banquet.

A total of 530 boys registered at Future Farmer headquarters, in addition to many taking part in the stock show and those from nearby schools who did not register. The total number was within 75 of the registration of last year when the event was held during Thanksgiving vacation.

The purpose of the program was to give Future Farmers an opportunity to see the livestock and packing industry and other commercial activities of a large metropolitan center; to see some of the west's finest livestock, and to travel over the state and see its agricultural resources, at exceedingly low cost.



Future generations in the baking sun of the Imperial Valley will have cause to remember that the Future Farmers of El Centro contributed to their comfort. The picture shows one of the rows of the drought-resistant palo verde trees being grown by the chapter for planting along city streets, to replace trees killed by the dry weather.

CENTERVILLE BOYS KEEPING FERTILIZER TEST RECORDS

Extensive fertilizer trials on cauliflower are being conducted by the Future Farmers of Washington Union high school at Centerville, on land owned and operated by Max Stevenson. The test is to determine what advantage may be secured either in increase of yield or improvement in quality by the use of various elements.

Fertilizers being used are cow manure, ammonium phosphate, sulphate of potash, super-phosphate and lime. The latter includes four kinds of lime—gypsum, sugar beet lime, commercial lime and ground oyster shell. The plan is to determine if any or all of these will give the desired flocculating effect on the soil, and increased yield.

The Future Farmers laid out 30 plots each 12 by 363 feet, and applied the fertilizer or directed its application. Cauliflower was planted during the last week of September, all done by hand. The ground was quite rough and cloddy. About one-quarter of the field was planted before being irrigated, but the remainder was irrigated and then planted.

Approximately three acres of land was used in the tests. There are a total of 18 plots actually fertilized and 12 are guards and checks. Fertilizer was drilled into the rows—more than four miles of drilling.

The plots are laid out so that each fertilizer is tried alone and in combination; on top of lime and on top of manure, and on top of both. The rows were staked and labeled and a permanent map made.

From now until harvest in March, the Future Farmers will keep frequent records on growth, both in size and rapidity. With the harvest, records will be made of the amount and quality from each plot. The trial is a good exercise in farm management.

By Anthony Silva and Joseph Kato.

The Live Oak chapter, California's Number One entry in the national chapter contest, while not wishing to discourage Turlock's establishment of a chapter thrift bank, rises to remark that it takes more than that to win the national competition. Melvin Herrick, the Live Oak reporter calls attention to the fact that Live Oak had such a fund last year. With all the different kinds of cooperative savings, chapter thrift banks, individual banking promoted by the chapter and what not, we are a little puzzled as to whether Turlock or Live Oak is first, or each first in something different. Anyway, we think it's a darn good idea.

The Modesto chapter has secured a $200 loan from the student body for a chapter feed project. The hammer mill of Harold Jolliff, ag graduate, is being used to grind 24,000 pounds of hog mix, which includes barley, rice, beans, ground alfalfa and minerals. The swine production project operators will be able to purchase the feed at $30 per ton and the chapter will net $2 per ton on the operation. This is the first cooperative venture of its kind in the Modesto chapter.

Gridley chapter members recently presented a burlesque, written and given by the advanced agriculture class, before the student body. The presentation was a mock Future Farmer meeting. Completing the program was a talk on "The Aims and Furposes of the F. F. A.," by President Bruce Jensen; and "Trying to Study," a pantomime by the sophomores.

Seven Orland members have forty-five weanling pigs on feed for the Interstate Junior Livestock show at South San Francisco next spring. Prospective ribbon winners are Roland Creek, James Hattrup, Duaine Foster, Bernard Delsman, Harman Kolousak, Oliver Havens and Randall Finch.

Eight prospective poultrymen from the Turlock chapter recently visited the Dryden farms at Modesto to learn more about Barred Rocks. Five boys placed orders for these chicks, expecting to raise some for meat production and keep others for laying.

Kansas chapters not having programs of work submitted to the state adviser by November 1 will not be eligible to have State Farmer candidates during the current school year, according to a ruling passed at the Kansas Association of F. F. A.

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"I'm not ashamed of anything I've done," Rogers said quietly. "I just realized that it wasn't fair of me to stay on the team, and I got off without any fuss or bother."

"What do you mean, 'fair,' " said Chapman.

"Well, I know I'm just a tramp. I like to play football, but I'll never get any further than prep school. Here was Russ Jones, as fine a boy as they make, with a great chance for college fame, and me cutting him out of his chance to shine. It wasn't fair.

"I fixed it up with a cousin of mine in Beaudoin to send me that telegram. I had the rest of it all fixed. Getting you out of the house that night was the hardest thing to figure, but one day I heard your wife say in the grocery store that her birthday was the coming Wednesday.

"I tried to change my voice when I phoned to Doc Esson, but as you found out, it wasn't entirely succesful. Then, when I came over to your place, I made plenty of noise about it—if Hank Spurlin hadn't come along, I'd have found some other means to fake my attempt to get in touch with you. I got on the train without a ticket, paid a cash fare to Millford and doubled back here.

"I had already arranged to get a job as furnace-tender in the hospital. It's always dark down here—the superintendent hired me in the dark and has never seen me in daylight yet. That part of it was duck soup."

"But why did you come back," said Chapman, swallowing a strange lump in his throat.

"I didn't want to let Chatwood down, Coach. If anything had happened to Russell, I could have staged a reappearance in plenty of time, and my studies were up so I would have been eligible to play. That's why I faked the telegram, it would have been a good thing to show the principal—if I had needed to use it.

"I heard by the 'grapevine' when they brought Russ in, and took the long chance of being recognized by sneaking up to take a look at him. His eyes were open, but he was too groggy to know anything." The coach made no comment.

They were silent for a long moment. Then the coach said, "Where are you going now?"

The boy shrugged his shoulders. "South, I guess. It's a cinch I can't stay here. Basketball will be starting soon, and I know a school that can use a center pretty badly." He got up and put on his coat.

"So long, Tex," said Chapman, unashamed of the moisture in his eyes as he gripped the boy's hand. "I won't try to persuade you to stay, and I can only tell you that you are about the whitest kid I ever knew."

"Stow it, Coach," said Rogers, reaching for the door. "You know blamed well that I'm just a 'tramp athlete.' "

THE END

George P. Couper.

Continued from page 3

winter; mustard, Florida Broadleaf; onions, Australian Brown and Yellow Danvers; peas, Laxton's Progress; turnips, Purple Top; beets, Detroit Red; lettuce, Imperial "F."

December is an excellent month to work over the ground for late plantings, fertilizers should be applied and plowed under, and in pieces where much water has been applied for a previous crop, some lime should be added. We are hearty advocates of turning the soil up rough at this time of the year and allowing it to get thoroughly aerated and at the same time letting it absorb as much rain water as possible.

So far, this season has been the most auspicious for several years. Early rains and plentiful, gives us a brighter outlook than for many years. With so many crop failures in other sections, and with its resulting depleted supply of foodstuffs, it looks as though the truck crops man would have a bumper year coming up. *W. B. Howes.*

WASCO—Residents of this district got their money's worth in a recent boxing and wrestling program sponsored by the Future Farmer chapter. Forty-eight boys participated in 12 wrestling and 12 boxing bouts, with Sterling Giddings of the school board as referee, Principal B. R. Crandall as timekeeper and Coach Paul Wise as announcer. The matchmaker was Albert Booth, with refreshments in charge of Ernest Schellenberg; publicity, Jack Vermillion; ring construction, Gordon Macklin; general program, Loren Voth. Proceeds go to project financing and chapter activities.

If you enjoy and profit by these programs each Monday noon in your class or luncheon room, tell your parents and friends about them. They will be equally interested.

TUNE IN MONDAY NOON

12 to 12:15 o'clock, for

Vocational Agriculture

STATIONS KPO, KFI, KFSD

This weekly radio agriculture lesson will be presented each Monday noon during the school year, except during vacations. It is for your help and information as high school students. Your school radio will bring you these valuable suggestions.

Presented by the National Broadcasting Company and the State Bureau of Agricultural Education, State Department of Education

1934

Oct. 1—Testing dairy cattle for production; dairy herd records; making test sample bottle holder.

Oct. 8—Laying flock management, meat bird brooding.

Oct. 15—Cover crop growing, fall management of orchards; care of orchard equipment.

Oct. 22—Growing fall pigs; constructing a self-feeder.

Oct. 29—Feeding beef calves for spring market or showing; feed and show equipment.

Nov. 5—The sheep outlook; care and management of breeding ewes until lambing; care of sheep equipment.

Nov. 12—Winter management of breeding sows; building a colony house.

Nov. 19—Suggestions for pruning; care of pruning equipment.

Nov. 26—Care of tillage implements.

Dec. 3—Lambing time and its problems; docking irons, docking board and lambing pens.

Dec. 10—Care and housing of farm machinery.

Dec. 17—Tree and plant pests, disease identification and control; upkeep of spray equipment.

1935

Jan. 7—Selecting dairy cattle, and the care and management of sires; making a bull exerciser.

Jan. 14—Selecting the poultry breeding flock, and its management; repair of poultry equipment.

Jan. 21—Growing lambs for spring shows, market or breeding; building lamb creeps and feed troughs.

Jan. 28—Spring care and management of beef cows; feeding equipment.



Feb. 4—Incubating and selecting chicks; care of the incubator.

Feb. 11—Home improvement through landscaping; making a hotbed and cold-frame; care of landscaping tools.

Feb. 18—Raising dairy calves; dairy calf equipment.

Feb. 25—Preparations at the hog nursery; making a farrowing box and guard rails.

Mar. 4—Care and management of draft and saddle horses; harness and saddle repair.

Mar. 11—Brooding and feeding chicks; feeding and brooding equipment.

Mar. 18—Propagation of truck crops; care of gardening equipment.

Mar. 25—Weaning, showing and marketing of milk lambs; building a sheep shade and care of equipment.

Apr. 1—Feeding and management of the cow in milk; feeders, drinking fountains and troughs.

Apr. 8—Poultry plant management; poultry plant equipment.

Apr. 22—Care of irrigation equipment.

Apr. 29—Weaning pigs and growing them for market; making self-feeders.

May 6—Culling the poultry flock, pullet care, marketing; making a catching crate.

May 13—Maintaining a healthy dairy herd; sanitation equipment.

May 20—Propagation, grafting and budding; care of grafting tools.

May 27—Equipping the farm shop.

VOCATIONAL AGRICULTURE is the first network program designed to bring a regular radio agriculture lesson to the California high school classroom. Your comments, suggestions and indications of approval, sent to Jennings Pierce, National Broadcasting co., 111 Sutter st., San Francisco, will be valuable in planning the material for these programs and for their continuation in the future.