

The Colorado Agricultural College

**Its
Functions**

1919

**The Service
It Is Rendering**



*Being a syllabus of facts
pertaining to the State
Agricultural College of
Colorado compiled expressly
for the information of the
members of the Twenty-second
General Assembly of Colorado*



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The Colorado Agricultural College

Brief
No. 1



The Functions of The Agricultural College

The Colorado Agricultural College, located at Fort Collins, has many functions besides that of educating the young men and women of the State for lives of usefulness. The institution has proven so useful in the agricultural and industrial development of Colorado that other activities have been assigned to it until today it is serving the people in many and greatly varied ways. From the application of science to agricultural and industrial problems down to the lending of help to the housekeepers of the State and the improvement of the educational opportunities of the boys and girls, not to mention duties of a civic nature in connection with certain State boards and commissions, the institution is charged with various responsibilities.

The average person thinks of a college as an institution devoted entirely to the education of young men and women, and, indeed, this is the extent of the functions of most educational institutions. The Agricultural College, in addition to its educational work on the campus at Fort Collins, is reaching, in its service to the people, into practically every corner of the commonwealth, and almost every man, woman, and child in Colorado is receiving, directly or indirectly, benefits from its activities.

Resident Instruction

The educational work of the Agricultural College, herein referred to as "Resident Instruction", is divided into two classes, namely, collegiate education and secondary training. At the time this brief is written, 1,234 students and student-soldiers are receiving training on the campus at Fort Collins, including the College proper, the School of Agriculture, and the members of the Students' Army Training Corps.

Collegiate Education

From all over the State, from adjoining states, and even from foreign countries, students go to the Agricultural College to obtain technical training in Agriculture, Engineering, Home Economics, Veterinary Medicine, and General Science. This year 683 students are being trained.

The work done in the classrooms and laboratories on the campus is of such a nature that graduates of the institution enter successfully into competition with those of the best colleges and universities of the country and quickly advance to positions of responsibility and importance. The instruction is not only of a high technical standard, but due thought and consideration are given to the practical application of theoretical principles, and this is especially true of those subjects

directly allied to agricultural or industrial activities. Military training is required of all men students up to the senior year, and it has been a part of the curricula since the establishment of the institution. A wholesome interest is taken in athletics by both faculty and students, the College football team having fought its way during the past few years from the lowest position in the conference to the championship for two successive seasons. While the men are drilling or engaged in athletic practice, the young women are required to spend a certain time in the gymnasium, where they are taught the importance of exercise and are daily given physical training. Fraternities and sororities provide opportunities for foregathering with congenial spirits, and wholesome social functions carefully supervised by a faculty committee serve to round out life on the campus for the sons and daughters of Colorado who are training for their life work.

No better advertisement for an educational institution can be found than a contented, loyal student body; love for their alma mater is an outstanding characteristic of the students at C. A. C.

Secondary Education

The Colorado School of Agriculture.—It became evident several years ago that something must be done to provide a more practical education for the boys and girls of the State who could not go to college, but who were compelled to enter upon their life work immediately after leaving high school. There are hundreds of boys and girls in the State each year who find themselves in these circumstances and in order that they might have opportunity to fit themselves for lives of practical usefulness, the Colorado School of Agriculture, Mechanic, and Household Arts was established on the campus at Fort Collins. This institution, maintained in the same classrooms and laboratories and with practically the same faculty as the College proper, receives boys and girls from the eighth grade and gives them three years training along distinctly practical lines in Agriculture, Mechanic Arts, and Home Economics, including such cultural subjects as facilities and time permit, so that they are ready when they leave school, at the average high school age, to enter more intelligently upon their future in the field, the shop, or the home.

The Fort Lewis School of Agriculture, Mechanic and Household Arts.—Down in the southwestern part of the State, in Montezuma and La Plata counties and adjacent territory, lies a veritable empire of prosperous farmers and ranchmen which, because of transportation difficulties and great distances, is virtually cut off from the educational centers of the State. In order to provide educational facilities for the young men and women of this great territory, the Fort Lewis School of Agriculture, Mechanic and Household Arts, at Hesperus, twelve miles west of Durango, was established by the Eighteenth General Assembly, and made a part of the educational organization of the Agricultural College. This school is open to students of the eighth grade and instruction is along the lines indicated

in the name, a special effort being made to adapt the agricultural instruction to the particular conditions found in that section of the State, and to make the mechanic arts and home economics subjects particularly adaptable to the farm shop and the home. A course is also provided for those who desire to teach.

The Agricultural Experiment Station

Very soon after the establishment of land grant colleges, of which the Agricultural College is one, the people realized that these institutions were valuable potential agencies for other service to their constituents besides the function of educating young people. It was naturally necessary to establish technical laboratories in order to teach agriculture, engineering, home economics, veterinary, and science subjects and a corps of technical experts were, of course, gathered at these institutions. With the laboratories already established and workers capable of using them already on the ground, experiment stations were organized at all the land grant colleges, and since that time the Colorado Station has been an important and very helpful factor in the agricultural and industrial development of Colorado.

Through scientific research and investigation it has been able to help the farmers and stockmen, and industrial interests to solve many a knotty problem which might not only have retarded but made impossible the further prosecution of certain enterprises. Notable among these are a number of profitable crops now grown by the farmers of the State which it was not believed, before the Station tried them out, could be raised in Colorado. The problems of the housekeeper have not been forgotten, and are receiving scientific attention in a section of the Station devoted to research and investigation in home economics.

The Seed Laboratory

Heavy losses are suffered by the farmers of Colorado annually through the planting of impure and diseased seed. The Twenty-first General Assembly passed a law designed to remedy this condition by regulating the sale and importation of field and garden seeds, and by providing a means by which farmers and seed dealers might have an official test of their seed made.

The enforcement of the regulatory measures in this law, and the conduct of the official tests were delegated to the Agricultural Experiment Station. A seed laboratory was established on the Campus at Fort Collins, specialists employed, and the work immediately entered upon. The law provides certain specific labels for all seed packages, the inspection of seed stocks, the testing of samples, and the publication of results of inspections and tests, within the discretion of the officials of the Experiment Station.

This new measure for the improvement of crop yields met with instant favor

and state-wide co-operation from the farmers and seedsmen, who took immediate advantage of the protection and aid it provided. Thousands of samples of seeds, from farmers and seedsmen all over Colorado, have been tested at the laboratory, the regulations of the law have been carefully enforced, and these activities have resulted in a state-wide awakening among farmers and seedsmen to the vital importance of planting only pure seed, of cleaning, testing, and treating.

The Engineering Experiment Station

The industrial development of the State has been so rapid and there is so much to be done in the years to come that the Twentieth General Assembly passed a law providing for research and investigation along this line. In accordance with this law, an Engineering Experiment Station has been organized solely for work on industrial problems.

Specialists from the departments of Mechanical, Electrical, and Civil and Irrigation Engineering make up the staff of this Division. An important project now under way provides for the testing of road materials found in Colorado. Apparatus will soon be installed for making laboratory tests and practical tests have been made by building trial stretches of road of various combinations of material and observing how they stand up under actual traffic conditions. With more and more attention being paid to auto-truck haulage by the farmer and the merchant, and with the coming of the motor transport for moving freight from manufacturer to distributing points, the road question is becoming of increasing importance daily, and these tests will supply invaluable information for use in bringing Colorado highways to a maximum of efficiency.

Although the Engineering Experiment Station has been established but a comparatively short time, it is already hard pressed by the demands made upon it by the manufacturers of the State.

The Extension Service

As the people came to realize the information available at their Agricultural College and the possibility of its practical application to their problems, they commenced to call more and more upon the institution for assistance, and it became necessary to send members of the faculty and Experiment Station staff into the field out over the State, especially in rural communities, to give personal attention to the problems of the people. In addition to this, questions which could be answered by mail became so numerous that the institution was soon sending thousands of letters each year to the people of the State, conveying information upon various subjects for which they had asked. Thus was originated what is known as extension work, organized at the present time under a division known on the campus and all over the State as The Extension Service. The demands of the people

became so numerous and their desire for co-operation with the College so insistent that this service has grown until now 50 specialists are devoting all their time to this important work in Colorado, whereas seven years ago there was only one.

With the entire technical organization of the College faculty behind them, and with the vast fund of technical and practical information available at the Experiment Station, this organization is proving of real help and genuine value to the people of the State. Briefly summarized, it is functioning as follows: Twenty nine county agricultural agents are serving the farmers and communities in a like number of counties, assisting in the application of scientific principles to practical farming, helping combat crop and animal pests, helping with labor problems, assisting the farmers toward better co-operation, and generally aiding in community development; nine women are assisting the housewives of the State to meet their problems, three of these being located in three of the principal cities and six serving the women of as many different counties; twelve specialists trained for some particular service are co-operating with these agents and lending assistance in unorganized counties in the following lines: Farm Management, Animal Husbandry, Markets and Marketing, Extension Schools, Agronomy, Boys' and Girls' Clubs, and Publications.

Vocational Education

The Sixty-fourth Congress passed a measure known as the Smith-Hughes Bill which provided for co-operation with the states in establishing vocational schools in agriculture, trades and industries subjects, and home economics. In accepting the provisions of this Federal Act, the Twenty-first General Assembly of Colorado designated the State Board of Agriculture, as the State Board for Vocational Education, empowered to co-operate with the Federal Board for Vocational Education and to administer the work in Colorado. The close relationship of the State Board of Agriculture to all the people of the State, and the work it has been directing to help the people of rural communities to improve the schools in the country, made it a very logical agency for such a task and an especially advantageous one from the standpoint of cost to the State, because it had an organization ready to immediately enter upon the work. Designed to provide practical vocational training for boys and girls earlier in life than heretofore and upon a broader and more general scale, with especial attention to those who, from necessity, have to work while going to school, this new work will prove of very great value to thousands of boys and girls of Colorado and to the industrial interests in furnishing them more highly skilled workers. It has been under way now a little over a year and a more detailed report will be made in a subsequent brief.

Community Betterment

It has been the belief of sociologists and leaders in rural community development for a number of years that rural community advancement would eventually center around the rural school, and this belief has proven well founded in the light of progress made here in Colorado during the past three or four years.

The people of Colorado were quick to see this vision and eight or ten years ago commenced to give active attention to the improvement of their rural schools. In response to a demand from numerous sections of the State for assistance in this important work, the Agricultural College employed a specialist and began to help with the problem. This work has resulted in the establishment of 68 rural consolidated and centralized schools where the best of educational facilities, including high schools, are provided for children who formerly were compelled to get their education in the little, old-fashioned, one-room, district school. As predicted by those who saw the vision ten or fifteen years ago, these schools are rapidly becoming the centers of their communities, one in particular, the Sargent School in the San Luis Valley, being regarded as the very best community social center, combining religious, educational, and social activities, in the entire country.

Special Forms of State Service

A number of other duties have been assigned to the College by the Legislature from year to year. The State Board of Agriculture is the State Fair Board and as such is charged with the duty of distributing certain appropriations set aside for prizes for agricultural, horticultural, live stock, and industrial exhibits at the State Fair and at district fairs.

The State owns a considerable area of forest land, and when the State Board of Forestry was established by the Eighteenth General Assembly, the State Board of Agriculture was designated as such. It employs the State Forester and has general supervision of his work.

The work of the State Horticulturist is under the direction of the College through its Board of Agriculture in its capacity as The State Board of Horticulture.

The College is responsible for the success of two other important State governmental activities, namely, the work of the State Entomologist and of the State Dairy Commissioner. The statutes creating the offices of State Entomologist and State Dairy Commissioner provide that the professor of Entomology at the State Agricultural College shall be the State Entomologist and the professor of Animal Husbandry shall be the State Dairy Commissioner. The Board appoints these professors and therefore, indirectly, is responsible for the ability and fitness of these two state officials.

These are important state offices. The State Entomologist is charged with guarding the field, orchard, and garden crops of the State from infestation by crop pests from outside the State, as well as with the control of outbreaks of these pests within infested areas wherever practicable. The duties of the State Dairy Commissioner include the maintenance of certain standards of purity and cleanliness through inspection, and the enforcement of regulations provided therefor, as well as to lend assistance to the dairy industry generally in the State. Dairying is becoming more and more a leading agricultural activity in Colorado and the importance of this work is naturally growing with the industry.

War Service

When the United States entered the world war the Agricultural College was immediately called upon for emergency service in a number of lines. Increased food production was the first big task undertaken and the institution threw its whole resources behind the drive in Colorado, functioning through its country agricultural agents, its extension specialists, and members of the College faculty, who were sent immediately into the field during that first summer of 1917.

While the College was responding to this first call for war service, her students and alumni by the hundreds were flocking to the colors, until at the present time 634 men from the Agricultural College and the School of Agriculture have entered their country's service. Of these, 119 are commissioned officers, including 4 majors, 4 captains, and 101 first and second lieutenants. Besides these, 45 Aggies are serving as non-commissioned officers. Such a large proportion of officers is unquestionably the result of the military training these men had at the College. These figures do not include the members of the Students' Army Training Corps now in training on the campus nor 59 members of the S. A. T. C. who have recently gone from the College to officers' training camps.

When the Governor organized his Council of Defense the College was asked to co-operate with that body. The president of the College was made a member of the Council and chairman of the advisory committee on food production, conservation, and marketing. The specialist in farm management was appointed chairman of the committee on farm labor, the professor of agronomy was made chairman of the seed committee, the professor of farm mechanics was appointed chairman of the committee on tractors, the specialist in marketing is chairman of the committee on markets. The director of the Extension Service is a member of the advisory council committee on county organization, and the professor of home economics is a member of the women's committee of the Council. Two of the professors are members of the Red Cross committee. In all the activities of this war-emergency State body the Agricultural College and its various organizations have closely co-operated.

The president of the college is a member of the executive committee of the State Food Administration, and the professor of home economics is director of the work in home economics carried on in the state by the Federal Food Administration.

The editor of publications is county director of publicity for the Liberty Loan and War Work drives.

As the close of the first summer approached, the need for the conservation of food became apparent and the Agricultural College, through its home demonstration agents, its county agricultural agents, its department of home economics, its office of markets and marketing, its department of horticulture, and its specialists in boys' and girls' clubs, conducted demonstrations, held meetings and short courses, and distributed literature to stimulate interest in conservation and to be a practical help to the people in their desire to do their part toward winning the war.

Then came the call from the United States War Department asking the college to train soldiers along certain mechanical lines. Although this involved the expenditure of a considerable sum of money for which other plans had been made, the erection of buildings, the purchase of much new laboratory equipment, unusually heavy pressure on an already busy faculty, as well as many other responsibilities, the College quickly responded and agreed to take 250 soldiers for training in general mechanics, automobile operation and repair, and wireless telegraphy. Although the emergency called for the expenditure of precious building funds for the use of which carefully considered plans had been made, temporary shops and laboratories, a mess hall, and barracks for these soldiers were constructed and detachments from the army were soon being trained in mixing and pouring concrete, in driving automobiles and army trucks, in repairing all kinds of autos, in carpentry, in forge, in the machine shop, in blacksmithing, and in the wireless.

As the time for the opening of the College term approached there came the organization by the War Department of the Students' Army Training Corps, which meant a complete and radical reorganization of the entire course of study of the institution upon a quarterly basis instead of the semester plan, the placing of every male student of the institution under the military authorities instead of the civil, and the building of a new barracks as large as the first, together with an increase in the facilities in the mess hall and war-training laboratories. Soldier-mechanics to the number of 480 have been trained during the past five months on the campus at Fort Collins, 250 are now in training, and 253 young men enlisted in the Students' Army Training Corps were preparing for service in Uncle Sam's army when the war closed and are still pursuing their education at the College.

We have attempted to give you here a brief conception of the functions of the Agricultural College. More detailed explanations of the activities in which you are interested will be given you in subsequent briefs which will be mailed to you from time to time.

*The Colorado
Agricultural College*

*Brief
No. 2*



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just 16 minutes
for you
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in your cover NOW,
before you forget---
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Educational Functions

There is a tendency among people not informed regarding the educational functions of the Agricultural College to think of them as confined to subjects directly relating to agriculture. This mistake may be attributed perhaps to the incompleteness of the name of the institution, but chiefly to a lack of information on the part of the people regarding the intent and purposes which actuated those responsible for the establishment of land grant colleges.

The teaching of agriculture and allied subjects is, of course, one of the important functions of the College, but it is only one of six other lines of education of equal importance to the people of Colorado, which are carried on by the College.

The men who drafted the original Morrill Act of 1862, under which Act the land grant colleges were established, had a vision of the future possibilities of these institutions which inspired them to make the designated functions of the colleges so broad that they would serve all the people instead of a single class. They accordingly wrote into the Act establishing these institutions the following:

“ . . . to the endowment, support and maintenance of at least one college (in each state) where the leading object shall be, without excluding other scientific and practical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts,” “in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.”

Further emphasis was laid on the broadness of the scope in which these institutions were intended to function in what is known as the Second Morrill Act, which was passed in 1890 and which provided for further support and maintenance of these land grant colleges. In this Act we find the following:

“ . . . to be applied only to instruction in agriculture, the mechanic arts, the English language and the various branches of mathematical, physical, natural, and economic sciences, with special reference to their application in the industries of life”

Upon this broad foundation the Colorado Agricultural College has been built and developed, not only teaching agriculture and allied subjects, as its name signifies, but teaching other subjects related to the industries, the home, and the sciences.

The natural resources of Colorado have inspired industrial growth and development even as agricultural expansion has been invited by the broad areas of tillable soil and by the irrigation resources provided by Nature. This industrial growth has naturally caused a lively interest in engineering among the youth of the State with a resultant increase in the importance of engineering subjects at the Agricultural College. The demand for engineering courses has grown until at the present time the institution is training civil and irrigation engineers, electrical engineers, and mechanical engineers, graduates from the College having had a big part in the development of the industrial resources of the State. Veterinary medicine has developed, during comparatively recent years, into a lucrative, important and respected profession and with this growth the Division of Veterinary Medicine at the the College has made corresponding advancement. The Agricultural College was one of the first institutions in the Rocky Mountain region to establish a course in Home Economics and Colorado young women are availing themselves of the advantages of this division in increasing numbers yearly. In a body of students such as yearly attend the Agricultural College there are always some who develop talent and preference for the sciences. To provide these with a means for following their natural bent and inclinations the course in General Science was established and is elected by a number of students each year. Rural consolidated schools, city high schools, and vocational schools are demanding teachers of Agriculture, Home Economics, and Industrial Arts subjects in ever increasing numbers and this has necessitated the establishment of training courses for teachers. We have, then, as the six major educational functions of the Agricultural College the following:

- Agriculture.
- Engineering
- Veterinary Medicine
- Home Economics
- General Science
- Teacher Training.

The work of these various divisions will be explained in abbreviated detail in the following paragraphs:

Agriculture.—Under this division the College is training the sons of Colorado to intelligently enter upon farming operations, stock raising, dairying, fruit growing, gardening and the several allied lines, the courses of study being designed with special reference to conditions within the State. The agricultural division is divided into major lines as follows: Agronomy, Animal Husbandry, Entomology,

Forestry, Horticulture. The student registering for one of the agricultural courses spends the first two years in studying the fundamentals implied by the general term "agriculture" and in the third and fourth selects one of the major lines in which he desires to specialize. In this way, when he graduates, he is equipped to enter upon general farming in any of its general phases or to specialize. A sufficient amount of work is required in mathematics, chemistry, and farm mechanics to give the student the necessary fundamental knowledge of these subjects and an appropriate amount of time is devoted to such cultural subjects as English and history, modern languages and music, the latter being elective. In addition to training farmers, stockmen, dairymen, and orchardists for lives of usefulness within the State, this division yearly graduates a number of students who have fitted themselves for special forms of service such as farm management specialists, dairying specialists, botanists, horticulturists, foresters, entomologists, experiment station workers, managers of large agricultural or livestock enterprises, and teachers.

Engineering.—There are three principal courses in this division and as is the case in the agricultural division the first two years are spent in building a groundwork for specialization, which is done in the third and fourth years.

Mechanical engineering is becoming of increasing importance in Colorado because of enlarged activities in harnessing natural power and in the establishment of manufactories. Through its mechanical engineering department the College is serving as a valuable support to these activities, supplying men for many duties and responsibilities from those of the artisan up to those of the efficiency engineer. The course is broad and practical, covering such subjects as boilers, the principles of mechanism, the steam engine, thermodynamics, the transmission of power, machine design, engineering design, heating and ventilation, refrigeration and refrigerating machinery. Internal combustion engines such as are used on automobiles and tractors are carefully studied and for the young man attracted to the railway field there is training in the design and construction of locomotives and other rolling stock and the study of different forms of signals and switches.

Electricity is indispensable to all modern industrial enterprises and activities. Electrical engineers trained at the Agricultural College are filling responsible positions in the big industrial centers. Their education has been complete and thorough from the elementary features of electricity up to the study of electric railway systems, electrical power transmission and the design of electrical machinery and apparatus. Because of the unusual opportunities for water-power development in Colorado and the Rocky Mountain region, the study of the construction, operation and maintenance of hydro-electric plants is especially thorough.

The course in civil and irrigation engineering not only gives the student all the preparation of a civil engineer, but additional training which equips him to become a specialist in irrigation. He studies, while preparing for his specialty, such other important subjects as the construction of highways, strength of materials, concrete construction, bridge construction, and railroad building. Highway problems are growing of more and more importance in Colorado and the West and the young men from the College who have had this course will prove valuable additions to the ranks of the men who are working to give the people better roads as well as filling places of invaluable service in industrial and community development.

The field for teachers of these subjects is rapidly increasing and yearly attracts graduates.

Veterinary Medicine.—Until recent years the word “veterinarian” immediately suggested to the mind “hoss doctor”. And while the old-fashioned “hoss doctor” undoubtedly filled a real need, his station in life was not usually one to inspire ambitious youth to efforts along the line of his vocation. Modern advancement has changed this order of things. The functions of the trained veterinarian are so important to the success of the livestock industry and to the safeguarding of the public health through meat inspection that he is looked upon as a professional man. The division of Veterinary Medicine has been unable for years to fill the demands for its graduates, a fact which better conveys the high standard of the work, than could be done by any attempt to describe it in detail.

Home Economics.—The application of science to the problems of the household is unquestionably resulting in a better fed, more contented, more home-loving type of citizenship; certainly it is resulting in a happier, more efficient type of womanhood. In taking the well-grounded course in domestic science the young woman learns hundreds of things about food values, food combinations and how to cook them that she could never learn in the training school of experience. When she has finished the course in domestic art she has learned things about household management and the artistic decoration of her home and herself which make life a thousand times more worth living. Colorado young women are being trained along these lines at the Agricultural College and the courses have proven so popular that the young women on the campus this year number 218. Not only is this training offered for the young woman who expects to preside over a home of her own, but special courses are arranged for those who desire to teach.

General Science.—The various science departments necessary to form well-rounded courses in the other major subjects offer excellent opportunity for specialization in the sciences, and yearly attract students who desire to specialize in or

teach science subjects. They offer subjects as follows: Chemistry, Physics, Botany, Vocational Education, Pathology, and Bacteriology.

Teacher Training.—The rapid increase in the consolidation of rural schools, bringing high school facilities to the country, and the increased interest in agriculture and home economics which is being evinced by town and city high schools, have created a widespread demand during the last few years for teachers of agriculture, mechanic arts, home economics, and science subjects. This demand has been greatly added to during the past year by the increased activities in vocational education under the Smith-Hughes Federal Act. This act provides for vocational schools in agriculture, home economics, trades and industries subjects. For a number of years the College has been training teachers in home economics and agriculture and is now carrying on this work in industrial arts subjects to meet the new demand created by the Federal Act. This work in teacher training not only covers the principles of pedagogy as applied to the particular subject for which a student desires to qualify, but provides for practical experience which gives the graduate unusual fitness for immediate and efficient service. For three months during the senior year each student taking the teacher-training work is actually a teacher, having complete charge of a class for that period of time. During this period the closest supervision is given the work of the student by the department head under which he is working and by a supervisor who devotes full time to guiding the classroom work of the student-teacher. Unusually good opportunity for this actual experience is provided in the student body of the Colorado School of Agriculture, the members of which are taking practically the same vocational work that these new teachers will be required to teach in rural high schools, city high schools, or vocational schools. The work complies with all the provisions of the State Certification Law and the graduate is entitled to a teacher's certificate.

Conservatory of Music.—The Conservatory of Music is one of the most successful institutions of its kind in the West. Instruction is given in voice, pianoforte, violin, and other instruments. Men's and ladies' glee clubs are organized each year and never fail to please their audiences on their tours of the State.

Military Training.—Military training has been given at the Agricultural College since its establishment. By referring to the quotation in the early part of this brief, taken from the original Morrill Act, it will be noted that it was included among the functions of the land grant colleges. This training, which is required of all male students up until their senior year, has always been regarded as valuable supplementary training to that of the usual college course. It stimulates patriotism, provides beneficial physical exercise, and develops qualities of leadership which are

valuable later in life no matter what line of activity the graduate may enter. During the war, military training on the campus at Fort Collins has been carried on along a greatly intensified plan. This will now be greatly modified, but the military training as carried on by the College in co-operation with the War Department before the war, probably upon a somewhat advanced scale, will be resumed.

Physical Training.—The Agricultural College authorities believe, in concordance with all modern thought, that properly directed physical exercise is essential to success in any profession or walk in life. Physical training is therefore provided for both men and women, it being required of the men in the freshman and sophomore years and of all women up until the senior year. This is in addition to the athletic activities of the students, in which a very wholesome interest is taken; those men students who go in for baseball, basketball, the track team, and football are excused from the regular classes in physical training.

Summer Session.—Each summer a special session is held for those desiring special work in the various lines offered by the College. During this session a School for Extension Workers is held, designed especially to provide preparation for service in the great field of agricultural extension which is constantly demanding more men and women than can be supplied.

Growth.—The growth of the College is well illustrated by the increase in enrollment, which is given below, the past ten years being covered:

1909-10	217
1910-11	253
1911-12	322
1912-13	403
1913-14	515
1914-15	602
1915-16	638
1916-17	649
1917-18	502
1918-19	682

The Colorado School of Agriculture

The work of this institution, designed as it is to provide practical education for graduates of the eighth grade who cannot go to college, is chiefly of a vocational nature. Work is given in agriculture, mechanic arts, and domestic science, and the courses are so designed as to provide practical training which will enable the graduate to enter more intelligently upon his life work on the farm, in the shop, or in the home. In the agricultural division, such subjects as field crops, soils, farm management, farm motors and machinery, the principles of blacksmithing, and the use of carpenter's tools, animal husbandry, horticulture, and botany, are studied. In mechanic arts, the elementary principles of mechanical drafting are given, as well as lathe work in wood, work in the machine shop, telephony, surveying, irrigation and leveling. The domestic science subjects are very practical and include cooking, serving of meals, laundry, personal hygiene and home nursing, household management, sewing, millinery and embroidery, and dressmaking. Physical training is required of all students the same as in the College proper. This school, as stated in Brief No. 1, is conducted on the same campus at Fort Collins as the College proper, the same buildings and, for the greater part, the same faculty being employed.

The growth of the school during the past ten years is shown by the following enrollment figures. The stress of war times should be kept in mind when considering the figures for this year, which are really good in view of conditions prevailing when the School opened:

1909-10	213
1910-11	291
1911-12	331
1912-13	365
1913-14	418
1914-15	390
1915-16	368
1916-17	370
1917-18	353
1918-19	309

The Fort Lewis School of Agriculture, Mechanic and Household Arts

This institution is located at Hesperus, twelve miles west of Durango, and it is providing an educational opportunity for hundreds of young men and women of the great Southwest who might otherwise find it necessary to forego an education because of the remoteness of their homes from educational centers. The school is open to graduates of the eighth grade and courses are offered in agriculture, domestic science, and teacher training. The practical phases of agriculture and stock raising are given proper attention in the agricultural course and mechanic arts subjects are closely allied to lines that may be carried on in the farm shop. In domestic science the practical again predominates, the work being confined to cooking, household management, laundry, sewing, dressmaking and millinery.

School Aiding in the Development of the Southwest.—In addition to its educational work, the Fort Lewis School is carrying on important activities which will materially assist in the development of the great Southwest. In co-operation with the Colorado Experiment Station some important investigations, the results of which will prove of great value to the farmers of that section, are under way at the Fort Lewis School. Experiments are being carried on to determine varieties of field crops, fruit trees, and garden vegetables which can be grown in the higher altitudes. It has heretofore been impossible to undertake to raise many of these crops in the extreme altitudes of 7,000 feet such as are found at Fort Lewis and vicinity. It is hoped by these experiments to discover hardy types which can be grown at those elevations and if this does not result, attempts may be made to produce new strains which can be successfully grown there.

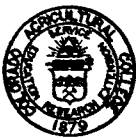
The School is well equipped with pure bred livestock which is in keeping with the industries of the Southwest, a natural stock country. Two of the best Percheron stallions of the entire section are owned by the School, in addition to herds of cattle and dairy stock.

*The Colorado
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*Brief
No. 3*



Service to The People

The work of serving the people of the State with agricultural and household information and assistance has proven to be so effective and valuable that the demand for it has increased very rapidly during the past few years. The very nature of this work has precluded the widening of activities beyond the public demand, because the co-operation of the people to be served was necessary to its success. That the demand has been constantly in excess of the ability of the organization to serve, is the best evidence we could have that the plan of the work is based upon sound principles, that it is proving effective, and that it is the thing the people want.

The calls for this service have become so numerous that they have necessitated a large organization of administrators and technical specialists who devote all their time to the work. In addition to this organization, which is described in this brief, the entire technical staffs of the College and of the Experiment Station, with their wealth of technical ability, experience and information, constantly co-operate with the organization for the furtherance of the work. The heads of departments of the College faculty co-operate in the work by being responsible for the subject matter used by the various specialists, and faculty members frequently help in the field when needed.

This work has come to be known as "extension work", a name derived from the nature of the activities, and the organization through which it is carried on is known as The Extension Service. The headquarters for this organization are on the campus at Fort Collins, where the work is administered by a Director and leaders for the various divisions, all being directly responsible to The State Board of Agriculture and the United States Department of Agriculture, in the case of the co-operative activities.

The work is divided into two main divisions, in one of which the activities are carried on in co-operation with the Federal government and in the other supported entirely by State funds. Under these two main divisions, especially under the division covering the co-operative work with the Federal government, are other sub-divisions as will be noted in the following paragraphs describing the work:

Smith-Lever Extension Activities

Federal funds for extension work first became available in 1914, when the National Congress passed a law known as the Smith-Lever Act, appropriating money for co-operation with the various states in this work. Colorado promptly

were so bad in certain sections that much land became unfit for cultivation. A specialist from the Experiment Station determined the causes of the trouble and also methods by which the land affected may be reclaimed.

For years there has been discrimination in the markets against Colorado wheat because of the presence of "yellow-berry", or soft wheat. An exhaustive study of the problem by a Station worker revealed the cause and means of preventing "yellow-berry".

The insect pests have been continually the object of study by the Station workers. Their life habits and methods of controlling them have been worked out and many thousands of dollars' worth of crops saved to the farmers, fruit growers, and gardeners of the State. Grasshoppers, plant lice, leaf rollers, bean beetles, cut worms, and army worms have been given special attention.

Important facts regarding the best cultural methods to be used in growing potatoes in Colorado, and the effects and methods of control of potato diseases have been ascertained.

Studies of dry-farming methods and dry-farm crops which have been carried on for many years have furnished information which has been an important factor in the success of the dry-farming industry in Colorado.

The Station has developed and introduced many varieties of fruit, field, and garden crops adaptable to the higher altitudes of the State where conditions require especially adapted varieties.

Extensive studies of bacterial diseases attacking plant life in Colorado have been made, resulting in means of control being devised. These studies have included such diseases as those which attack alfalfa, field and garden peas, and the sour cherry. A fungous disease known as "spur blight" which attacks raspberries in Colorado has been successfully combatted.

Comprehensive studies of the methods in use in various irrigation systems in the State have been made with a view to improving irrigation practices. Among these has been a detailed and careful study of the Cache la Poudre Valley, one of the oldest and best organized irrigation districts in the United States. These studies have resulted in the accumulation of information which will enable the farmers and irrigation companies to bring irrigation in Colorado to a much higher state of efficiency. Investigations have been made into the loss of water from reservoirs and ditches by evaporation and seepage, and the reclamation of seeped land has been given considerable attention, practical assistance being given in many instances to encourage farmers and land owners to reclaim land of this nature.

The cause of "brisket disease" which formerly caused serious loss to the stockmen of the State whose ranges and ranches are in the higher altitudes was ascertained and a means of control developed by an Experiment Station worker.

Extensive experiments in feeding livestock for the purpose of determining the feed value of Colorado-grown forage and grain crops combined with sugar beet by-products have been made and much valuable information upon this subject made available to the stockmen of the State.

One of the most important pieces of work in the history of the Experiment Station has been brought to a successful culmination during the past two years. As every Coloradoan knows, thousands of sheep are fed within the State each year. For a number of years there have been excessive and costly losses of lambs in the feed lots shortly after their arrival. The disease which has caused the losses was peculiarly baffling and required extensive investigation and careful observation of conditions which might logically have been supposed to contribute to the cause. An Experiment Station specialist finally determined that these losses were caused by hemorrhagic septicemia and succeeded in demonstrating that they could be almost wholly prevented by vaccination. Over 30,000 sheep were vaccinated in Colorado last year as a result of this investigation and it is now recommended that all lambs be vaccinated against this disease before being sent to the feed lots.

For a number of years mysterious and expensive losses of sheep have been suffered while the animals were on ranges or being driven from one point to another. In one case alone, where 1,437 sheep were driven into a field to stay over night near Cortez, 754 died before morning. Experiment Station specialists have demonstrated that these losses are caused by the whorled milkweed and their experiments have shown that it is peculiarly deadly.

Records of temperature, rainfall and atmospheric conditions for a period of 31 years, including observations at Fort Collins and a number of other points in the State, have been carefully kept by the Experiment Station and are available in bulletin form. These records cover the period from 1887 to 1918.

Work Organized on Two Distinct Lines.—The Experiment Station was first organized solely for work in the agricultural field and closely allied subjects. With the increase in population and industrial development it naturally became necessary to lend attention to the needs of the industrial interests, and the Twentieth General Assembly passed a law providing for research and investigation along this line. There are now, therefore, two main divisions of experiment station activity, the one being devoted to the agricultural and household interests and the other to the industrial interests. They will be treated of here separately.

The Agricultural Experiment Station

Problems of the farmers, the stockmen, the dairymen, the poultrymen, and the housekeepers of the State are given attention in this division and the results obtained are carried to the people in bulletins which are distributed free, and by the extension specialists, county agricultural agents, and experiment station workers themselves who go into the field for that purpose. A few of the more important projects now being prosecuted at the Experiment Station, as described in the following brief paragraphs, will convey an idea of the nature and general scope of the work:

Developing Dry-Land and High-Altitude Crops.—There are thousands of acres of land in the plains region of Colorado and in her mountain districts which, because of limited rainfall or soil and climatic conditions, make the cultivation of profitable crops difficult and uncertain of results. Experiments are being carried on in an effort to produce new varieties of both grains and fruits which will widen the range of crops and increase the profits of the dry-land farmer and the farmer whose land lies at a high elevation.

Effect of Application of Water to Grain Crops.—Most successful farmers know that the time of the application of water to grain crops has an important effect upon the quality and yield, but none know as yet at just what period in the development of the plant the water should be applied to get the very best results. An intensive study of this problem is under way.

Chemical Studies of Soils.—Difficulties presented by unusual composition of soils frequently prohibit the production of any crop whatsoever and Colorado is not exempt from this condition. Chemical studies of these soils as they occur in the State are being made, the purpose of which is to find, if possible, a means by which these lands may be successfully cultivated.

Soil Fertility and Bacterial Diseases of Crops.—Sometimes only the bacteriologist can analyze the exact conditions which affect soil fertility, one of the most important phases of farming operations. Problems of this nature are constantly arising in Colorado and they are met in the bacteriological laboratory at the Experiment Station. In this laboratory also are carried on investigations into the cause and means of control of bacterial diseases injurious to fruit and farm crops.

Potato Growing.—Potato growing is one of the most important and profitable agricultural industries in the State. Such an industry naturally demands attention from the Experiment Station and experiments and investigations are being carried on with a view to improving the crop through better seed selection, the introduction of better varieties, and the adoption of better cultural methods. Investigations and experiments are also being carried on for the purpose of ascertaining those localities within the State best adapted for the production of seed potatoes.

Hardy Fruits for Eastern Slope.—Although the western slope of Colorado is a successful and widely known fruit-growing section, this industry has not been carried on with any extensive success on the eastern slope because of climatic conditions. An effort is being made to develop hardy stocks of apples and pears which can be successfully grown on the eastern slope of the Rockies.

Insect and Rodent Pests.—The best of soil, the best of climate, and the best cultural methods combined are of little avail if there is no protection against insect pests which devastate crops. The Experiment Station is constantly guarding the interests of the farmer by investigating the habits and methods of control of insect pests, including plant lice, grasshoppers, the codling moth, the alfalfa weevil, and just at present is co-operating with the State Entomologist in a campaign to control rodents in Colorado, especially the prairie dog and the Wyoming ground squirrel.

Irrigation.—Irrigation has been the means of bringing the agricultural land adjacent to natural waterways in Colorado to its present state of high productivity. Although the practice has been in use all over the world for centuries, it has by no means been developed to its highest efficiency. Co-operating with the United States Bureau of Public Roads, the Experiment Station is making a thorough study of the irrigation systems of Colorado and the methods in use in the State with a view to improving them and increasing the duty of water. Improper practices in applying water have resulted in great areas of water-soaked land which have become unproductive because of this condition. This has presented complex drainage problems which are also receiving the attention of the Station.

Livestock.—The livestock industry in Colorado has experienced remarkable growth during the past few years. When it is remembered that the great packing houses and stockyards in Denver have grown to their present proportions during the past few years, comparatively speaking, a conception of the increase in the livestock industry in the State is obtained. This work has naturally presented many problems for the Experiment Station. Prominent among these have been experi-

ments to determine the feed value of various combinations of Colorado-grown feed with especial reference to the sugar beet industry. The sugar beet industry in the State has grown until, because of the great production of its by-products suitable for stock feeds, it has come to be an important factor in its relation to the livestock industry. These experiments have consisted in the actual feeding of different lots of livestock throughout a normal feeding season combining Colorado grain and forage crops with sugar beet by-products such as tops, pulp, and syrup. Some very valuable information for the stockmen of the State has thus been obtained.

Diseases of Livestock.—As a natural consequence of such a rapid growth in the livestock industry, diseases of livestock have come to demand statewide attention on the part of stockmen, with a resultant increase in the calls upon the Experiment Station for assistance in combatting them. Hemorrhagic septicemia, a disease which has killed literally thousands of lambs in the feed lots in Colorado and which is referred to in detail early in this brief, is still receiving vigilant attention from the Experiment Station, feeders being encouraged to vaccinate all lambs brought into the lots for feeding, to prevent losses from this disease. Contagious abortion, a disease which causes big losses to stockmen each year, is constantly being combatted.

Poisonous Plants Injurious to Livestock.—There are a large number of poisonous plants which grow in Colorado and which menace the livestock industry, among them the “whorled milkweed”, referred to earlier in this brief. One section of the Experiment Station is carrying on a project which has for its object the eradication of the whorled milkweed and this same section is also engaged in a microscopic study of the tissues of poisonous plants. Through this latter project the cell tissues of these plants are recognized so that when post-mortem examinations of stomach contents are made the exact weed which caused death may be determined, thereby enabling the stockman to know just what is killing his stock.

Ditches as Distributors of Weeds.—It is the opinion of many progressive farmers, as well as technical authorities, that irrigation ditches are extensive distributors of weed seeds. An investigation is being made to determine the extent of such distribution of weeds and a means of control.

Better Seed.—In compliance with the provisions of an act passed by the Twenty-first General Assembly, a seed-testing laboratory has been established at the Experiment Station and is rendering a valuable service to the seedsmen and farmers of the State which will actually result in the saving of thousands and thousands of dollars in agricultural products. The law was designed to prevent the sale of impure or adulterated seed within the State and to provide a means whereby seedsmen,

farmers and others could have official tests made of their seed, or seed they proposed to buy, so that they might know its exact condition. The regulatory provisions of the law are delegated to the Experiment Station, as well as the administration of the testing laboratory. The laboratory has been equipped for making purity tests to determine the presence of, or freedom from, weed seeds, dirt, sticks, gravel, foreign seeds, and adulterations, and also to make tests for germination. Anybody within the State may send samples to the laboratory where they will be tested and a report made upon them free of charge. During the past fiscal year 3,647 samples have been tested, 2,584 of these being from seedsmen and 1,063 from individual farmers. An interesting feature of the work of this laboratory is the hearty co-operation the representatives of the laboratory have met from farmers and seedsmen generally all over the State. There has been absolutely no antagonism whatever on the part of the seedsmen, but on the contrary they have realized that the regulations of the law and the advantages of the laboratory are distinct benefits to them and they are universally complying with the stipulations of the law regarding labeling and maintenance of quality, this being revealed by inspection trips made by representatives of the laboratory. The laboratory equipment and the technical staff have been valuable aids to certain Experiment Station projects that could not have been carried out without them.

The Problems of the Housekeeper.—The widespread interest which is being evinced these days in the application of scientific principles to the problems of the home has created a demand for research and investigation in this direction. A laboratory equipped for experimentation in foods from the angles of chemistry, bacteriology, and physics has been established at the Experiment Station and is now in operation. An investigation of the juices of fruits generally raised in Colorado and at all adaptable to jelly-making is being made, the purposes being to determine the particular stage of ripeness at which the juice will produce the best jelly and also the deficiencies in the juices of fruits which do not produce the best jelly. It is hoped as a result of these investigations to be able to give to the housekeepers of the State valuable practical information which can be used for their guidance in making jelly, and to suggest ingredients which may be added to the juices of fruits of poor jelly-making quality so that they may be more generally used. It is also intended that the laboratory shall keep in constant touch with the workers in the field and shall give considerable attention to practical problems encountered by the housekeepers from time to time and brought to the attention of the field workers.

The Engineering Experiment Station

This branch of the research and investigational work of the College is as valuable and indispensable to the industrial interests of the State as the Agricultural Experiment Station has been to the agricultural interests. The technical staffs of the engineering departments, including, as they do, mechanical engineers, electrical engineers, and civil and irrigation engineers, together with laboratories in each of these lines for the testing of materials, machines, apparatus, and equipment, and facilities for scientific exploration in untried fields, constitute an agency for this form of service unsurpassed in the West. In many respects western industrial problems are vastly different from those of the East, making all the more necessary and important the carrying on of work of this nature.

Conservation of Fuel.—Colorado has many industries which are extensive users of coal. The conservation of fuel in these industries, therefore, presents a real problem for a technical staff such as that of the Engineering Experiment Station, a problem calling for investigations into, and tests of, methods of burning fuel to accomplish as nearly complete combustion as possible, the proper insulation of steam-carrying pipe lines and other means of prevention of the loss of heat units.

Municipal Problems.—Municipal transportation problems, lighting problems, sewage and waterworks problems, are always to be dealt with and are especially susceptible to the application of scientific research and investigation in the cities and towns of a young and growing commonwealth like Colorado. Interurban transportation problems naturally present themselves wherever there is a rapid increase in population and Colorado is already commencing to feel these among her other growing pains.

The testing of heating appliances and various methods of heat distribution, the installation of central heating plants, and storage and refrigeration, are other fields which call for scientific investigation.

Development of Waterpower.—Everyone in Colorado is familiar with the great number of her mountain waterways. Many of these represent millions of latent horsepower which await only the skill of the engineer before they can be made to serve the people. In making possible the complete utilization of this natural resource alone the Engineering Experiment Station will more than justify the cost of its maintenance for all time to come. The utilization of this power will most logically come through the installation of hydro-electric plants, thus calling into use all three branches of the Station—the civil engineer, the electrical engineer, and the mechanical engineer.

Testing of Road Materials.—It seems superfluous to remind any citizen of the twentieth century of the trend of the times toward motor truck transportation of freight. The war has demonstrated better than the most comprehensive and extensive economic propaganda could ever have done that freight of an unperishable character can be moved from the factory to distributing points within certain limitations of distance more economically and faster by motor truck than by railroad and that the railroad has a bigger and more vital economic function in handling freight on the long hauls. All this means that there must be better roads, and this vital question is being given the closest attention by the Engineering Experiment Station. Experimental stretches of road of various combinations and materials such as are found in Colorado have been laid and tested over a period of years. This has made available important and valuable data which can be used in the building of new state highways. In addition to this, laboratory tests of the various road materials found within the State are being undertaken so that those charged with road construction will eventually have not only practical results for their guidance but also the results of scientific tests.

Agricultural Engineering.—Because of peculiar soil, climatic, and geographical conditions, agriculture in Colorado presents some real problems to the engineer. Machinery adapted to tillage, harvesting, and transportation to market in other sections of the country is often inadequate or not designed to meet conditions in this State. This means that much investigation and experimentation must be done to improve present machinery and to devise new equipment to reduce the cost of production. Means must also be devised for the manufacture of these new devices.

Thirty-eight Men and Women Engaged in the Work.—Thirty-eight men and women are engaged in carrying on the work of the various activities outlined above. Of these, 18 are devoting all their time to the work, and 20 are giving part time.

Mailing List Includes 10,598.—The results of all experiments and investigations are published in bulletins, which are circulated free to residents of the State. The mailing list includes 10,598 names of persons, most of whom are within the borders of Colorado. The Station has published, since its establishment, 248 regular bulletins, 58 press bulletins, and 12 circulars. These bulletins will total about 8,508 pages.

Work is Carried on Through Co-operation Between the State of Colorado and the United States Government.—The work of the Experiment Station is carried on through co-operation between the State of Colorado and the United States government, each contributing funds to the support of the work.

*The Colorado
Agricultural College*

*26 minutes!
Just six minutes
longer than
Brief No. 3
But---
It's worth it.*

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fer to it when you
need it*

*Brief
No. 4*



Service to The People

The work of serving the people of the State with agricultural and household information and assistance has proven to be so effective and valuable that the demand for it has increased very rapidly during the past few years. The very nature of this work has precluded the widening of activities beyond the public demand, because the co-operation of the people to be served was necessary to its success. That the demand has been constantly in excess of the ability of the organization to serve, is the best evidence we could have that the plan of the work is based upon sound principles, that it is proving effective, and that it is the thing the people want.

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This work has come to be known as "extension work", a name derived from the nature of the activities, and the organization through which it is carried on is known as The Extension Service. The headquarters for this organization are on the campus at Fort Collins, where the work is administered by a Director and leaders for the various divisions, all being directly responsible to The State Board of Agriculture and the United States Department of Agriculture, in the case of the co-operative activities.

The work is divided into two main divisions, in one of which the activities are carried on in co-operation with the Federal government and in the other supported entirely by State funds. Under these two main divisions, especially under the division covering the co-operative work with the Federal government, are other sub-divisions as will be noted in the following paragraphs describing the work:

Smith-Lever Extension Activities

Federal funds for extension work first became available in 1914, when the National Congress passed a law known as the Smith-Lever Act, appropriating money for co-operation with the various states in this work. Colorado promptly

accepted the terms of the Federal act and the groundwork for the organization which now is functioning in Colorado was quickly laid. The work has developed until now this service is being carried on in seven different ways, namely:

- County agricultural agents
- Home demonstration agents
- Boys' and Girls' clubs
- Specialists
- Extension schools
- Markets and Marketing
- Publications

Starting in 1914 with only five persons employed for full time in the work, this organization has grown until now it numbers 50.

County Agricultural Agents

This work has proven to be one of the most effective forms of extension service and it has been met with hearty co-operation on the part of Colorado farmers and county officials during the past few years. The county agent brings to the farmers and rural communities of his county many facilities and advantages not before available to them. He has behind him the Agricultural College, the Agricultural Experiment Station, and the United States Department of Agriculture, providing technical information and technical assistance where needed in any problems that may confront the farmers within his county. His activities, and the co-operative activities of the farmer which he is able to suggest and help promote, result in a greater interest in better methods of farming, of stock raising, of orcharding, of marketing, and of generally improving country life. With such a vast field to be covered, not only in territory but in subject matter, the county agent who multiplies himself in the largest proportion accomplishes the greatest good for his farmers. Organization is, therefore, one of the most important activities of the county agent, and by its use he is able to greatly facilitate the dissemination of information and the handling of county problems through various committees of the farmers themselves.

The activities of county agricultural agents vary according to the particular conditions within their particular counties. All work is carried on along definite prescribed lines, each activity being carefully planned a year in advance under the project plan. The activities include such subjects as better seed, better livestock, co-operative buying of dairy stock, eradication of grasshoppers, eradication of

prairie dogs, treatment of grain to prevent smut, control of insect pests, control of potato diseases, grading and packing of products, marketing.

The rapid growth of the work in Colorado during the past two years, or since the last previous session of the General Assembly, furnishes an excellent example of its effectiveness. Two years ago there were just 12 county agricultural agents in Colorado. There are now 29 employed in the following counties: Logan, El Paso, Rio Grande, Pueblo, Boulder, Morgan, La Plata, Adams, Kit Carson, Las Animas, Garfield, Fremont, Douglas, Huerfano, Weld, Delta, Sedgwick, Jefferson, Arapahoe, Montrose, Moffat, Prowers, Lincoln, Routt, Montezuma, Larimer, Otero, Phillips, and Sagauche.

These men are all responsible to a state leader, whose headquarters are at the Agricultural College at Fort Collins. The work is supported by the county, the State of Colorado, and the U. S. Department of Agriculture.

Concrete examples of the work will serve to show just how these agents are functioning and the results they are getting. A few of these examples are given as follows:

Farm Bureau Organization.—Past experience has demonstrated that the county farm bureau is the best agency through which all the farmers of a county can co-operate for the general advancement of their interests and for concerted action in the problems which confront them. With such an organization, the farmers themselves can much more efficiently function in any and all lines made necessary or desirable by conditions in their county, and they are enabled to realize much greater benefit from the service of the county agricultural agent, the Agricultural College, the Experiment Station, and the United States Department of Agriculture.

The county farm bureau is distinctly an organization of the farmers, for the farmers, and by the farmers, and its activities are so planned and carried out that they benefit all the farmers in a county regardless of whether or not they are members of the county farm bureau. The officers are all farmers and the county organization includes committees appointed to direct activities in the various lines which conditions indicate are desirable and in which the farmers decide to work. Under these committees are sub-committees for each community, charged with the carrying on of the work within their communities as the main committees are charged with carrying it on in the county. Only such activities as are actually needed and the farmers themselves actually want are entered upon.

These county farm bureaus have proven so essential to successful county agent work that Colorado county agents have been actively furthering their organization during the past year with the result that there are now 20 county farm bureaus in the

State. A state organization of representatives of these farm bureaus will be perfected early next year.

The Pueblo County Farm Bureau constitutes an excellent example of an effective organization of this nature. In this county farm bureau there is a president, vice-president, a secretary and treasurer, and an executive committee consisting of nine prominent farmers. The program of work for the year as adopted in Pueblo county includes the following subjects: Crop improvement, livestock improvement, pest control, food conservation, conservation of clothing, home conveniences, boys' and girls' clubs, roads, finance. There are community committees in 19 communities as follows: Goodpasture, Unity, Cousin Springs, Pinon, Undercliffe, Rye, Crow, Graneros, Nepesta, Orchard Park, Siloam, Avondale, Highlands, Mountain View, Vineland, St. Charles Mesa, Grimaldi, White Rock, Stone City, and Swallows. These community committees are functioning along various lines which logically come under the main projects and including such activities as seed treatment, rotation of crops, eradication of pests, hogs, silos, dairying, breeding, feeding, cultural methods, war breads, sugar substitutes food conservation, developing the water supply, and canning.

Standardization of Grains in Boulder County.—Three years ago the county agent of Boulder county began work upon a project the object of which was to obtain seed corn that would produce good silage, and in favorable years mature seed, in Boulder county. Until this project was begun, it was not believed that corn could be successfully grown in the altitude of Boulder county, where the lowest elevation is 4,900 feet. In 1916 the crop improvement committee of the Boulder County Farm Bureau became interested in the project and, as a result of the work which has been carried on, over 10,000 acres of corn were grown in Boulder county in 1918. Home-grown seed is used wherever possible. In 1914 there were 39 silos in Boulder county and there are now 333, 57 having been built during the past year, a direct result of putting the corn crop on a permanent and profitable basis.

This same committee carried on an extensive investigation into the merits of the different varieties of wheat and their adaptation to Boulder county conditions. The work was started in 1916 and the first season demonstrated that Defiance and Marquis wheat were the two varieties best adapted to that locality. There was a great difference of opinion, however, as to the relative value of these two varieties and demonstrations were continued in 1917 and 1918. The results are that it has been demonstrated beyond question that throughout a series of years Marquis will produce a larger amount of wheat and that it will grade one grade higher than the Defiance. As a consequence, a very large percentage of the wheat grown in Boulder county in 1919 will be of the Marquis variety.

\$47,673 Worth of Crops Saved in Huerfano County.—When the Huerfano County Farm Bureau made an agricultural survey of the county in 1917, it discovered that there were 50,000 acres of farm land within the boundaries of the county badly infested with prairie dogs. A plan was immediately outlined for the eradication of this pest and a request for assistance sent to the United States Biological Survey and the Department of Zoology of the College. Both of these agencies agreed to co-operate, six pest districts were formed and 50,780 acres of privately owned land were treated, 300 farmers co-operating. Poisoned grain to the amount of 5,078 quarts was used in this campaign, the cost of which was only \$854.20, and the result of which was a saving of \$38,085. In addition to this, 38,355 acres of public land were treated, resulting in an estimated saving in crops and range pasture of \$9,588. This, added to the saving accomplished on private lands, makes a total of \$47,673 which was saved from these pests.

Garfield County Stockmen Will Have Nothing But Pure-Bred Bulls.—Through the activities of the livestock committee of the Garfield County Farm Bureau, aided by the county agent, the stockmen of Garfield county have agreed that nothing but pure-bred bulls shall be used on the range in that county. A committee of nine stockmen was appointed to make purchases of bulls for the cattlemen, and a sub-committee consisting of three, appointed by this committee of nine and accompanied by the county agent, went east and purchased during the year 103 registered Short-horn and Hereford bulls. The introduction of this pure-bred breeding stock will result in a higher standard of livestock for the county, which means better and surer profits to the stockman. It is estimated that a saving of \$10,000 resulted through co-operative buying of these pure-bred bulls.

Home Demonstration Agents

Home improvement and the conservation of food and clothing have been receiving much attention during the past few years, especially during the war period, and the women of Colorado, both in the cities and in rural districts, have been taking a lively interest in these activities. Two years ago there was but one specialist in home demonstrations serving the women of Colorado. At the present time there are ten such specialists under a state leader and an assistant state leader, assisting the housekeepers of the State, three of whom are serving in cities and seven as county home demonstration agents as follows: Denver, Colorado Springs, Pueblo; Huerfano, Pueblo, Fremont, El Paso, Garfield, Weld, Las Animas, and Logan counties.

As in the case of the county agricultural agents, all work by these specialists is carried on along definite project lines, among these projects being such problems

as the following: Better homes, sanitation and health, food and clothing, community activities, conservation of food and clothing, elimination of waste of food products, water in the kitchen, nutrition, canning, organization of women, child welfare.

Boys' and Girls' Clubs

Of equal importance with the extension work carried on among adults is the work which is being done among the boys and girls of the State. By instilling the principles of industry and thrift and by constantly teaching the best methods of doing things, the boys' and girls' clubs are helping to pass on to posterity a higher type of rural citizenship, more scientific farmers and housekeepers, and better contented, more prosperous dwellers in the country.

Members of these clubs in Colorado produced \$196,870.32 worth of products during the past year. The total cost of this production was \$103,667.85, leaving a net profit earned by the boys and girls of \$93,202.47. This production included corn, potatoes, beans, garden vegetables, sugar beets, poultry, pigs, and calves, canned vegetables and fruits, food, and garments. In all of the clubs mentioned, the boys and girls performed all of the work, including the preparation of the land, the planting, the cultivation, the harvesting, and the marketing. The livestock production consisted chiefly in care and feeding, although in the poultry there was some production of chicks. The item of food represents food cooked by members of cooking clubs, and that of garments the various articles of wearing apparel made by members of the sewing clubs.

When it is remembered that this production was accomplished by boys and girls in hours formerly spent in idleness or undirected play, that the work was so organized that it held all the interest and diversion of real recreation, and that each and every boy and girl whose work went to swell these figures labored in the consciousness that he was producing something of his own, that the profits would be his and his alone, the far-reaching effect of this work can be comprehended.

The growth of this work is shown in the increase in club membership and in the growth of the organization for carrying it forward. Two years ago there were 3,325 boys and girls enrolled in these clubs in Colorado. During the year just closed, there were 11,290. Two years ago one state leader with one assistant constituted the whole boys' and girls' club organization. This year there are, in addition to the state leader, three assistant state leaders and 338 club leaders, of the latter 43 being paid leaders and 295 volunteers. Boys' and girls' club work is being carried on in 38 counties out of the 63 in Colorado.

Specialists

Technical specialists trained in specialized lines of agriculture and allied industries are indispensable aids to the furtherance of extension work. Equipped as they are to carry technical information from the College, the Experiment Station, and the United States Department of Agriculture direct to the farmers, they are of great assistance to the county agricultural agents and home demonstration agents, and can render valuable service to the farmers in unorganized territory.

Farm Management Demonstrations.—A specialist in farm management spends his time demonstrating to the farmers of the State the vital importance of applying business principles to farming. The work is carried on by surveys, the organization of farm record clubs and extension schools in farm management. Record books have been designed for the keeping of farm accounts and these are sold to the farmers at cost. The surveys and records obtained from the farmers furnish material which is worked up to demonstrate the advantages of keeping records.

Animal Husbandry.—Interest in the various phases of the livestock industry is on the increase in Colorado, a natural result of the adoption of better farming methods by the farmers generally. This has kept the animal husbandry specialist extremely busy during the past two years. During each of the years which have elapsed since the last report was made to the Legislature, extensive silo campaigns have been conducted by the specialist in animal husbandry throughout the eastern portion of the State. These campaigns have been carried on in the spring and have resulted in a large number of new silos being erected and a greatly widened use of silage and silage crops. Animal husbandry extension schools have been very popular and effective, and the specialist has served as judge of livestock at many district and county fairs and at the State Fair and National Western Stock Show.

Emergency Specialists

When the food emergency, as a result of the war, arose, the National Congress passed an emergency bill appropriating funds to be used in helping to meet the situation. Supported by these funds a number of specialists were sent to Colorado by the various bureaus of the United States Department of Agriculture to augment the forces of the Extension Service. The work of these specialists is briefly described in the following paragraphs:

Animal Diseases.—A veterinarian has spent his entire time in the field assisting in combatting animal diseases such as hog cholera, blackleg, and similar maladies which yearly take their toll of livestock.

Pest Eradication.—A trained entomologist was detailed to Colorado to assist in controlling and exterminating grasshoppers, cutworms, and other crop pests.

Pork Production.—A specialist in animal husbandry who has functioned as assistant state leader of boys' and girls' clubs has devoted his time to increasing the production of pork in Colorado through these agencies. Largely through the efforts of this specialist, who has had the hearty co-operation of the county agricultural agents, the boys and girls alone in the State have increased their production of pork by 346,489 pounds. In 1917, these club members produced 20,601 pounds of pork, while in 1918, they produced 367,090 pounds. In 1917, they raised 126 pigs and in 1918, 1,995. Membership in these club increased to 627 in 1918 against 126 in 1917.

Poultry Production.—The production of poultry and poultry products was one of the quickest means of increasing the food supply of the nation and the specialist in poultry production sent to the State carried on an aggressive campaign to encourage the farmers and the dwellers in cities and towns to raise more poultry. The slogan for the work was "One hundred hens on every farm and ten hens in every backyard". In one county, that of El Paso, there were 11,000 more chicks produced in 1918 than in the previous year and this may be taken as an example of the work all over the State.

Control of Rodent Pests.—An effective campaign to prevent inroads into the food supply by rodent pests was carried on, the specialist in this work having the co-operation of the office of the State Entomologist and of a large number of farmers. Private farm and pasture land to the extent of 114,240 acres was covered in the campaign to poison prairie dogs. Poisoned grain to the amount of 11,424 quarts was used, 750 farmers and land-owners co-operating, and the cost of material was \$1,254.50. The results showed that on all lands treated the average percentage of destruction was 87 and never below 85. It is estimated that crops to the value of \$77,873 were saved by this campaign. In addition to the work on private land, 72,655 acres of State and Government land were covered, resulting in a saving of \$19,950.

Extension Schools

Extension schools, where farmers and farm women actually go to school for four days at a time and undertake an intensive study of some subject in which they are interested under the direction of a competent instructor, have largely replaced the one-day farmers' institute in Colorado. An entirely new plan for adult instruction of this character was devised for Colorado by the extension school specialist and first tried during the winter of 1917-18. Under this plan definite courses are outlined in the various agricultural and household subjects, the farmers and farm women of the community, working in co-operation with their county agri-

cultural agents, selecting the subject or subjects in which they desire a school and enrollments being then taken. The school is held at some central point where facilities are provided and the instructional work is given by specialists of the Extension Service or members of the College faculty. As contrasted with the former one-day institute type of disseminating information and imparting instruction, this school has many advantages that are obvious. Part of the time of the school is spent in working upon practical problems which have been encountered by the men and women in attendance.

During the first winter, schools were held in animal husbandry, dairy husbandry, agronomy, home economics, animal diseases, farm motors, and farm management. During the season, 45 schools were held, at which the total enrollment was 989.

Markets and Marketing

Efficiency in marketing of food products affects all concerned—the producer, the commission man, the retailer, and the consumer. Through the Office of Markets, maintained in the Customs Building in Denver, a valuable service is being rendered to all concerned in efficient and economic marketing. Representatives of the office keep a careful check upon market conditions in Denver each day and reports are sent daily in bulletins to the farmers, giving complete and accurate information regarding supply, prices, and other details. Daily reports are also published for the benefit of the consumer in the press of the State and daily reports are received from the marketing centers of the country regarding the supply of, and demand for, such agricultural products as are produced in Colorado. All this information is now being sent to a mailing list of 20,000 persons, this list including individuals and firms interested in selling or buying agricultural products.

During the month of October, 1918, information requiring 435,508 words was distributed, not including relayed reports which passed through the office. Because of the advantageous geographical location of Denver in its relation to the territory in the Rocky Mountain region and west of the Rockies, the Denver office has been chosen as the main relay office for the distribution of all market information from the Federal Bureau of Markets and other eastern state offices.

In addition to this service, the office carries on extensive investigations. Wherever a marketing problem suddenly arises within the State which threatens to cause a loss to the grower or a loss of valuable food products, a representative is put onto the job, goes into the field, investigates all conditions and uses the machinery of the office and of the Federal Bureau of Markets in bringing the produced into

touch with a market. Waste of food products by spoilage is thus prevented and thousands of dollars saved annually to the producer.

Two years ago only three persons were required to carry on the work of this office. Today there are 22 employed on the staff. The work is carried on through the joint co-operation of the Extension Service, the Experiment Station, and the Bureau of Markets, United States Department of Agriculture.

Publications

Direct service in the field is materially supplemented by the dissemination of practical information in the form of bulletins and pamphlets. All extension bulletins are prepared in a strictly popular way and carefully and generously illustrated. Technical matter is eliminated so far as possible, the constant aim being to keep these publications practical and in such form that the information contained therein is readily and easily accessible for immediate use by the farmer receiving it.

In addition to this, the advertising for silo campaigns, extension schools, farmers' meetings, and organization campaigns for farm bureaus is planned and carried out.

General Extension

The Twenty-first General Assembly passed a bill—House Bill No. 160—appropriating \$10,000 a year for the support of general extension activities which could not be carried on with the Smith-Lever funds. This fund has made possible much valuable and effective work which otherwise could not have been entered upon. Some of the principal activities for which it has been used are as follows:

Marketing.—Only a limited amount of Smith-Lever funds can be used in connection with the work of the Office of Markets, and the fund for general extension has enabled this valuable work to be very greatly extended.

The Farmers Congress.—The Colorado Farmers' Congress has for a number of years been an active factor in the agricultural development of the State and it has become a valuable agency through which the Extension Service can serve the people. The State appropriation has enabled the Extension Service to take advantage of the opportunities in this direction in a more effective manner.

Farmers' Institutes.—There is a large demand each year for farmers' institutes, the requests coming both from the counties where there are county agricultural agents and from unorganized districts. Until the passage of House Bill No. 160, it was extremely difficult to meet these demands and they could only be filled in a very limited way because none of the Smith-Lever funds may be used for this purpose. This is an important piece of work, the institutes serving as feeders for

the extension schools besides providing an excellent point of contact with the farmers for the Extension Service organization and the College workers. With the funds now available it is being carried forward effectively.

Exhibits.—The graphic lesson will never lose its effectiveness. No matter how enlightened a people may become, a lesson taught in a graphic way, in a manner which they can visualize, goes home quicker, sinks deeper, and stays the longer. Exhibits at fairs will, therefore, always be an important part of effective extension work, and the Extension Service has been able to materially strengthen its work of this character during the past two years.

Judges at Fairs.—Extensive demands are made upon the College each year by the various district and county fairs, the State Fair, and the National Western Stock Show for judges for the various agricultural and livestock exhibits. Until the passage of House Bill No. 160 there were no funds for the support of service of this kind, a service that is vital and important to the agricultural growth of the State because these contests always stimulate interest in better products.

Bulletins.—Through the publication of bulletins the Extension Service is enabled to place in the hands of the people a great deal of agricultural and household information. These bulletins are confined strictly to practical subjects, they are written in simple language, they treat of problems pertaining to Colorado conditions and the demand for them is steadily increasing in all quarters of the State. In a good bulletin, written so he can understand it, the farmer or housekeeper has a collection of facts and information which can be preserved and referred to from time to time. This work, therefore, is one of the important activities of the Extension Service. Until the passage of House Bill No. 160, only a limited amount of these bulletins could be printed because only a small percentage of Smith-Lever funds may be used in this way.

During the past two years, however, with the funds provided by this bill, this activity has been greatly extended. In the biennial period covered by this report, 41 bulletins have been published containing 607 pages and with a combined edition of 163,000 copies. These editions have varied from 5,000 up to 10,000 according to the nature of their contents. In these bulletins such subjects as the following have been dealt with:

Silos and Silage	Harvesting and Storing Vegetables for Home Use
Domestic Water Supply	Trees for Non-Irrigated Regions in Eastern Colorado
Hatching and Rearing of Chicks	Wheat Growing in Colorado
Books for the Farmer's Wife	
Hog Management	

Corn Growing in Colorado
Prevention of Smut in Oats
Fighting Grasshoppers
Hints on the Conservation of Food
The Preservation of Fruits and Vegetables by Drying
Farm Storage of Apples and Potatoes
Incubation and Brooding
Feeding and Care of Little Chicks
Poisoning by Larkspur

The Poultry House
Management of the Dairy Herd
Meat and Meat Cookery
Home Curing of Meats and Their Preparation
Poultry Management
Storing Vegetables for Home Use
The Prevention of Smut in Grain by Seed Treatment
Potato Diseases and Methods of Control
Water Hemlock: A Poisonous Plant
Prevention of Blackleg

Dissemination of Information Through the Newspapers.—It has long been a recognized fact that a great deal of agricultural and household information can be effectively placed in the hands of the people through the newspapers. Practically every farmer takes a farm paper, some two or three, but it must be remembered that it is his little, local, home paper that he reads first and if he sees in this home paper an article upon a subject in which he is interested or which carries some information which is just what he needs, and if that article comes from his own Agricultural College, he is more likely to heed the suggestions given and more likely to put them into use than he would if the same information were presented to him in a farm paper in a long-winded article by an individual about whom he knows absolutely nothing. To fill this field, a clip-sheet called "News Notes", containing five columns, 17 inches in length, and filled with articles written by members of the College faculty, the Experiment Station staff, and the Extension Service specialists, is sent to the newspapers of the State each week. The newspaper men of Colorado have a commendable vision of the worth-while character of this kind of service and are co-operating in a generous and gratifying manner in publishing the information thus supplied them.

During the past two years, 501 signed articles have been published in News Notes and of these the newspapers have used 8,290 inches or a total of 414½ columns.

The Extension Service took an important part in war activities in Colorado, especially in the production and conservation of food. Organized as it is to serve practically all the people of the State, it was in closer touch with a larger number than any other agency and was, therefore, able to accomplish much in spreading the news of the task before the people and in helping them organize to perform it. A more detailed account of this work will be given in the brief devoted to war service.

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Country Life Betterment Through Rural School Improvement

The past few years have seen a general raising of the standards of educational, religious, and sociological conditions in the country in Colorado. The people in the rural districts have found that in their schools they have an agency with powerful potentialities for the stimulation of community co-operation, the advancement of community interests, and the broadening of community life generally. The schools, unlike the church, the farmers' club, or the rural social organization, represent a common ground upon which all can meet, for everyone is interested in the education of his children; the differences of religious sects, petty bickerings of business affairs, and the likes and dislikes of neighborhood cliques and social factions, can here be forgotten.

This centralization of these vital country life activities is taking place in Colorado today as the result of the efforts of the people of the rural districts to improve the educational facilities for their children. Commendable progress has been made in improving these conditions, and the people have found that in building for better education they have laid the groundwork for better religious and social life and even for better economic conditions, for the improvement of schools in the country is having an economic effect anticipated by few people ten years ago.

Until this movement to improve educational opportunities in the country was started in Colorado a few years ago, conditions were truly deplorable. So far as farming was concerned, the people had kept pace with twentieth century progress; modern methods of agriculture were in use; the latest and most improved types of farm machinery were found in plentiful numbers, and with the automobile and the motor truck, the telephone and rural free delivery, a dweller in the country had all the advantages of modern means of transportation and communication; but with all this progress, the antiquated methods of education of the nineteenth century were all that were provided for the children of these same people. The one-room school, where one teacher undertook to teach all ages, sizes and sorts of children in all of the eight grades, where there were no vocational subjects, and where the results were meager indeed, was the best that was afforded. It was but natural that the people should become discontented with this order of things and look about them for a means of changing conditions. A dangerous economic effect of this old system was the alarming drift from the country to the city of the very best of the country's citizenship who, for the sake of the future of country life, were needed as residents on their farms. These people moved to the city because they were not

satisfied with the educational facilities and the opportunities for social life in their home neighborhood. Their children were growing up, they must have an education, they must have opportunities for social enjoyment, and the city appeared to offer the only solution.

Campaign For Improvement of Schools Begun Six Years Ago

Public sentiment among country people for an improvement of educational facilities in the country manifested itself in Colorado something over six years ago. The General Assembly appropriated funds for the work and the Agricultural College promptly took steps to lend its assistance. The institution has naturally always been closely in touch and in sympathy with the people of the rural districts and although it was necessary, later, to take funds from the regular maintenance appropriations of the College to carry on the work, it was nevertheless continued and is going forward today. A specialist was employed who had a vision of the possibilities of improving country schools and who was in sympathy with the people desiring to bring this improvement about. The man selected had had wide experience with rural school problems, having filled all the positions from country school teacher to county superintendent of schools.

This specialist immediately set to work to gather all the information available regarding methods of improving schools in the country and made a complete survey of every school district in the State, including a study of the school revenues. Much time was spent in visiting the rural schools of the State to ascertain the exact conditions and possibilities for improvement. With the information thus gained, it was possible to render valuable service to the people, who commenced to call for lectures and consultations upon the problem.

The consolidation of a number of rural districts into one large unit finally became the popular method used by the people in bring about the improvement they desired. As each project took definite form, the specialist from the Agricultural College was called upon to help analyze conditions in that particular territory, to help decide where the school should be located in its relation to the various communities to be affected, to help in settling the boundaries of the area to be covered from the standpoint of feasibility of transportation, and the various other problems which presented themselves in the preliminary details of the work, even including information upon the legal side of the project. Information was supplied regarding the legal requirements to be complied with in calling and holding the elections which were necessary, and blank forms for the calling of elections and for other purposes were furnished. With each successive decision at the polls to adopt the consolidation plan, new problems presented themselves such as the selection of the

type of building to be erected, a method of transportation of the pupils, and courses of study. Assistance with these problems was given in each case.

All this work was carried on by the Department of Rural and Industrial Education of the College, and since the first year, has been supported entirely by funds from the maintenance appropriation of the institution. Only half of the first State appropriation was paid, and none has been made since.

The Improvement Accomplished

The consolidation plan made it possible to bring to the children of the country educational facilities equal in every way to the very best provided for city children. By consolidating a number of districts it was possible to concentrate school funds which were formerly scattered all over a territory. The funds available by this concentration made possible the erection of school buildings of the most modern type. These buildings are for the greater part constructed of brick, heated by steam, lighted by electricity or gas, provided with well-lighted classrooms, gymnasiums, auditoriums, lunch rooms, indoor toilets, and all of the conveniences which make for efficiency.

The improvement in the courses of study and the type of instruction made possible under the new plan resulted in a raising of the standard of education in the country in Colorado so that, in the districts where there are consolidated schools at least, it is unsurpassed anywhere in the country. Completely graded elementary courses, with adequate teaching staffs, are possible under this plan and what is most important of all, these schools bring within the reach of the country children high school facilities, a thing they had never had before except by driving to town each day or by the parents leaving the home farm and moving to town. With the new schools established the fathers and mothers in the country can educate their children until they have finished high school and have them under the parental roof every night.

Besides these advantages, the establishment of these new schools makes possible the introduction of vocational subjects such as agriculture, manual training, and home economics which were never before available to the children of the country, and this feature has become of increased importance during the past two years because of the passage by the National Congress of the Smith-Hughes Bill providing for Federal aid to the various states in vocational education. These schools can now qualify to receive this Federal aid in the teaching of agriculture and home economics, an advantage the country children could not have enjoyed without the consolidation system.

With the larger numbers assembled daily at these schools, better organized and more enjoyable play and recreation is possible. Football, basketball, baseball, can now be enjoyed by the boys and girls of the country where formerly, with only four or five boys and eight or ten girls in a school, it was exceedingly difficult to have any real fun. Playground equipment such as swings, teeters, and slides are now possible for the little tots.

Under this system the children are transported to and from school either in enclosed wagons or automobiles. They are called for in the morning and taken home again in the afternoon and the transportation system works perfectly throughout the school year.

These new schools have made possible a more permanent and more interested teaching staff. Where formerly, in many cases, the teacher in the country school came into the district on Monday morning and left for her home in town as soon as school was over on Friday afternoon, the teachers of the boys and girls in the country where these consolidated schools are established are contented to live permanently in the neighborhood and become more deeply interested in the problems of the community. This is possible because teaching conditions are better, buildings are more modern, more comfortable, and more pleasant to work in, salaries are better, and, in many cases, homes are provided for these teachers by the school district. The College has actively encouraged the erection of these homes, which have come to be known as teacherages, and one county alone has 15 such homes for the teachers in its consolidated schools.

There are 68 schools such as has just been described in Colorado today, replacing 180 old-fashioned, one-room schools and providing superior educational opportunities for 8,776 boys and girls of the country. One of the most striking facts in the statistics of these schools is that at the present time there are 1,091 boys and girls of the country getting high school training where under the old conditions practically none of them would have been enabled to pursue their education that far.

A natural question which arises is, But isn't it expensive? Statistics show that the cost per capita to the taxpayers for providing this type of education for country children does not exceed the cost per capita to the taxpayers for the education provided in schools in the cities. It has been further demonstrated that it is actually cheaper to provide these schools than it is to send the children to town each day, or for the family to move to town, to say nothing of the loss to the country of valuable citizenship where the latter plan is used.

Effect of The Consolidated School on Country Life

As previously stated in this brief the people in districts served by these consolidated schools are finding that as they build with the purpose in their minds and hearts of providing better educational facilities for their boys and girls, they created for themselves a new community institution which, beside fulfilling the function for which it was established, is proving to be the means for, and center of, other activities and enterprises which are contributing as much to the comfort, convenience and pleasure of life in the open country as the schools themselves are contributing to Colorado's future citizenship.

In the first place, these schools, wherever they have been established, have absolutely stopped the trend from the country to the city. It is no longer necessary for the country family to leave the home farm and move to town for educational advantages and opportunities for social life.

The people have found that these fine buildings, well heated and well lighted, with comfortable, spacious auditoriums, are ideal places for all sorts of community meetings, including social and business gatherings. Lecture courses have been established enabling the people of the country to bring within their own reach the entertainment of the musician, the instructive message of the lecturer, and the diversion of the minstrel and the actor which has been denied them before. A broader, fuller, more satisfying, happier social life is naturally the result.

The problem of the church in the country has been a serious one confronting church and community leadership. Because of the smallness of numbers, the maintenance of a church for each of the several religious denominations has in nearly every case proved a failure in the country. The people are finding that a solution of this vexing problem is presented by the new consolidated school. Here the people can assemble for non-denominational religious worship, forgetting their creeds and joining whole-heartedly in the services, a thing they could never have done in any one of the denominational church buildings which may have existed in their districts before the coming of their new school.

The Sargent Consolidated School, located eight miles north of Monte Vista, in Rio Grande County, furnishes a good example of how the consolidated school is coming to be the center for rural community educational, religious, and social advancement. One year ago the community served by the Sargent school had nothing but the old-fashioned, one-room school; today it has a handsome brick building costing \$35,000, including classrooms, an auditorium, and laboratories for the teaching of agriculture, manual training, and domestic science. The building is upon a ten-

acre site, it has running water, lavatories, toilets, is heated by steam and lighted by electricity. This building replaces nine of the old-fashioned, one-room school buildings and is providing educational facilities for children living in an area covering 83 square miles. Practical courses in agriculture, farm mechanics, manual training, and home economics are included in the curriculum. The enrollment is 319 and 12 teachers are employed.

One year ago the community served by the Sargent Consolidated School had only two weak Sunday Schools and no church organization whatever. A community church was organized in May, 1918, a pastor was employed at a salary of \$1,500 a year, which was raised by voluntary subscriptions, and today there are 114 regular members of this community church. A Sunday School with an enrollment of 319 has been established and includes in its enrollment the following: Men's Bible class, 55; women's Bible class, 75; senior department, 40; intermediate department, 43; primary department, 62; cradle roll, 31; teachers and officers, 13. The average church attendance per Sunday is 205 and a young people's society with a membership of 44 is flourishing. Denominations as follows are represented in the membership of this community church: Christian, Methodist, Presbyterian, Congregational, Latter Day Saints, Baptist, Lutheran. In what other manner could so many people from so many different sects and creeds have been brought together for religious worship?

Economic Effect of Consolidated Schools

Although it was realized that improvement in the schools would have some effect upon land values in the neighborhood, the extent of its effect was not realized before the establishment of the new system. Land values have increased in every instance, and according to the farmers themselves in the Sargent district, farm land is worth from \$300 to \$500 more per quarter section since the coming of the school than it was worth before.

The effect on tenancy, long recognized as an undesirable system of farming, has been one of the greatest economic benefits accruing from these schools. With the necessity for leaving the country for better educational facilities removed, and especially with the enlarged social and religious activities the schools are making possible, the farm owners and their families no longer are drawn to the towns and cities.

A direct and very beneficial effect has been felt in the labor problems by the farmers in districts served by these schools. It is no longer difficult to obtain competent farm help because the farm worker no longer hesitates to move his family permanently into the country.

With the transportation which it is necessary to maintain for these schools, closer attention has naturally been directed to roads in the country with a very appreciable improvement in their condition.

Effect on Living Conditions

Already evidences are showing themselves of the effect of these fine buildings and their attendant advantages upon living conditions in the communities they serve. They lend a new interest to life in the country and with better education for the children, better social life, and better religious life, the people are building homes and farm buildings with the idea of permanency, attractiveness, comfort, and convenience more predominant than ever before. There are more telephones, more modern home conveniences, more labor-saving devices, better home libraries, and a better home life in the individual household than before the consolidated schools came.

Colorado Schools Attracting National Attention

The consolidated schools which have been constructed in Colorado are already attracting national attention because of the completeness of their plants, the scope of their courses of study, and the broad community uses to which the buildings are being put. The success of transportation over long distances is especially a source of much interest and wonder. Greater distances are being covered in Colorado by auto busses than anywhere else in the country, 16 miles being covered in some cases. From the standpoint of efficiency in education and as a community center, the Sargent School has been pronounced by authorities to be the very best in the United States. It is significant in this connection that not a single consolidation of rural schools in Colorado has proven a failure.

Work Accomplished is Merely a Beginning

Although much has already been accomplished, as has been set forth in this brief, the work which has been done is merely a beginning. Only 10 percent of the 90,000 to 100,000 children in third-class school districts are receiving the benefits of these consolidated schools. When it is realized that fully 60 percent of these 90,000 to 100,000 children live under conditions favorable to consolidation, the work yet to be done can be realized. The College is going forward with this work along the same lines it has pursued in the past and will continue to assist the people of the country in providing better educational opportunities for their boys and girls.

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**Brief
No. 6**



State Departments and Commissions

The functions of a number of the State departments and commissions have been assigned to the Agricultural College from time to time because their administration calls for technical knowledge such as is possessed by members of the College faculty. These departments and commissions are designed either to stimulate interest in agricultural and livestock activities, to maintain standards by inspection, to increase production, or to safeguard agricultural industries. They are briefly described in the following pages:

State Entomologist

This important state office, for which the Agricultural College is indirectly responsible, is charged with the protection of farm and orchard crops against the ravages of insect and rodent pests, and losses from weeds and plant diseases. Thousands of dollars are lost each year by the farmers and orchardists of Colorado because of the presence of these pests, and without a vigilant and energetic organization constantly at work these losses would be greatly multiplied. The State law establishing this work stipulates that the professor of entomology at the Agricultural College shall be the State Entomologist and the work has therefore become closely linked up with the College.

Control of Alfalfa Weevil.—One of the most important pieces of work the State Entomologist has been called upon to undertake is the control of the alfalfa weevil which made its appearance in Colorado a little over a year ago. The weevil is the most destructive insect to this most important farm crop known. Almost without exception a loss of 50 percent of the alfalfa crop results from its devastations when no preventive measures are taken.

The weevil was first discovered in Colorado by a senior student of the College prosecuting some field work in Delta county. It was immediately reported to the State Entomologist and during the extraordinary session of the General Assembly in 1917 an appropriation was made providing for the control of the pest. Only a very small area in eastern Delta and western Gunnison counties was infested, but because of the destructiveness of the pest it was extremely important that it should be controlled. The weevil, which was imported from Europe into Utah some fourteen or more years ago, has spread since then extensively over that state and into the states of Idaho and Wyoming. It is estimated that it will spread at the rate of ten

miles a year along all the boundaries of the area it infests unless some effective means of control are introduced.

Control measures in Colorado have consisted of quarantining shipments of hay and straw and other material which might transmit the pest from Delta and Gunnison counties to other parts of the State, the use of arsenical sprays and the introduction of parasites which are enemies of the weevil. Life history studies are also being made of the pest. This year the area infested does not exceed 50 square miles.

The destructive nature of the weevil works another hardship upon the territory it infests in addition to the damage it does to crops. For instance, Oregon, Montana, Idaho, California, and Arizona have all issued quarantines against shipments of hay and straw and, in some cases, even household goods, fruits, vegetables, and live-stock, from Delta county into their boundaries to prevent the transportation of the weevil to those states. This involves a great deal of inspection and the issuance of certificates to show that shipments comply with the regulations of these quarantines. These quarantines against Colorado products will rapidly increase unless the weevil is kept in check.

Horticultural Inspection.—All nurseries within the State producing fruit trees, shade trees, and shrubbery of any kind to be offered for sale within or outside the State must be inspected from time to time to prevent the spread of pests which attack these trees and shrubs. A rigid inspection is made of all nursery stock coming into the State to prevent the introduction of pests of this kind. The bill, as originally passed, provided only for the inspection of such stock as that already mentioned, but it has been amended from time to time until now it covers insect pests and diseases of all farm and orchard crops, including especially potatoes.

The State Entomologist is also charged with the inspection and analysis of insecticides and fungicides offered for sale within the State to protect the grower against worthless products.

Apiary Inspection.—The honey-producing industry is one of Colorado's most healthy and promising enterprises. The State Entomologist, working thru his deputies and the county bee inspectors, is waging a campaign for the control and extermination of foul brood and other contagious bee diseases. American foul brood is quite general and the European foul brood is commencing to make its appearance, calling for special precautionary measures.

Control and Eradication of Common Barberry.—A vigorous campaign has been in progress all over the country during the past year for the control and eradication of the common barberry which harbors black stem rust of wheat during the spring season of its life cycle. The State Entomologist has issued an order calling for the extermination of this plant throughout the State of Colorado and, in co-

operation with the United States Bureau of Plant Industry, and the department of Botany of the Colorado Agricultural College, a specialist has been engaged to devote all his time to this important work.

Quarantines.—Much work must be done in assisting the people of the State in complying with the quarantines issued by other states against Colorado shipments and also in issuing quarantines against other states to protect Colorado growers. Many states have laws which control the shipment of nursery stock, hay, potatoes, fruit, and other farm products, some even including livestock, because of the presence in Colorado of some insect or crop pest such as the alfalfa weevil. To comply with the regulations of these quarantines, inspections must be made and certificates issued so that shipments can be made from Colorado points. Quarantines have been issued against a number of other states, one, for instance, quarantining certain localities in California, Texas, and other states against the shipment of potatoes into Colorado because of the presence of the tuber moth within their boundaries. A quarantine is in effect against the shipment of common barberry into the State or from one point in the State to another, as well as quarantines against all sections where the alfalfa weevil is known to be.

Control and Eradication of Insect and Rodent Pests.—Vigorous campaigns are waged yearly against grasshoppers and prairie dogs whose inroads into crops in Colorado cause large losses. Attention is also paid to noxious weeds and to plant diseases. Pest control and eradication is accomplished in most cases through the organization of pest districts covering territory not to exceed 36 square miles, which districts are organized on the request of a majority of resident land owners and for the control or extermination of any of the pests which are to be found in the State. Whenever necessary the State Entomologist may declare any portion of the State to be a pest district for the eradication or control of insects, prairie dogs, weeds, or other pests.

The work with prairie dogs alone furnishes a good illustration of conditions in the State and the campaigns being carried on. It is estimated that 11,314,158 acres of land in Colorado are infested with prairie dogs and that these dogs cause an annual loss of \$1,250,000. Of this area, approximately 2,000,000 acres are now within 80 pest districts which have been organized and in which vigorous campaigns for the extermination of these pests are being carried on. During the past year, the office sold to farmers in the pest districts over 15 tons of poisoned grain to be used against the prairie dogs. This grain, by the way, is sold at actual cost.

The U. S. Bureau of Biological Survey is co-operating with the office of State Entomologist in a very liberal manner in this work and during the present fiscal year will spend \$25,000 in eradicating the prairie dogs from government land. The

expenditure of this money is confined, so far as possible, to government land which comes within or adjacent to pest districts already organized. The State Land Board is also co-operating with the office of State Entomologist in eradicating the prairie dog from state-owned land.

The fruit tree leaf-roller in Fremont county, during the year just closed, caused a damage estimated by conservative men of the district at \$500,000, destroying fully 50 percent of the fruit crop. Two pest districts for the control and extermination of this pest have been organized in Fremont county.

Organization.—The State Entomologist has a chief deputy who is in active charge of the details of the administration. Under the chief deputy are other deputies, one each for the work in rodent control, apiary inspection, and the control of the alfalfa weevil, the last, because of the seriousness of the pest, having three assistants.

All county horticultural inspectors work under the direction of the State Entomologist, being appointed with the approval of this official and paid by the counties they serve. Twelve counties are now being served by county horticultural inspectors, as follows: Larimer, Boulder, Denver, Pueblo, Fremont, Garfield, Mesa, Delta, Montrose, Montezuma, La Plata, and Otero.

Apiary inspection is organized in the same way and 16 counties in the State have apiary inspectors, as follows: Boulder, Delta, La Plata, Mesa, Morgan, Otero, Prowers, Montrose, Montezuma, Pueblo, Logan, Weld, Larimer, Fremont, Garfield, and Adams.

State Dairy Commissioner

The rapid growth of the dairy industry in Colorado makes this office of increasing importance both from the standpoint of the enforcement of the regulatory provisions of the law and the field work which is carried on. The fact that Colorado during the past biennial period passed from a state which imported large quantities of dairy products to one that is self-sustaining in this respect gives some idea of the rapid growth and increasing importance of the dairy industry. The law creating the office of State Dairy Commissioner stipulates that the professor of animal husbandry at the Agricultural College shall be the State Dairy Commissioner. This brings the work of the Dairy Commissioner into close relation to that of the College.

Inspection and Regulation.—The Dairy Commissioner is charged with the enforcement of the regulatory provisions of the dairy law which are designed to maintain proper standards in all dairy products, including whole milk, whole cream, condensed milk, ice cream, butter, process butter, cheese and other

products, as well as certain definite standards of cleanliness where milk is produced or milk and milk products handled. This includes sanitary conditions of buildings, equipment, and all containers for milk and milk products. The State law regarding the sale of oleomargarine is very strict and holds to prescribed limitations; the enforcement of this law is placed in the hands of the State Dairy Commissioner.

These regulations are enforced through the means of licenses and regular and thorough inspection. For instance, the quality of milk and cream is determined by the Babcock test and any person applying the Babcock test for the purpose of fixing market values in Colorado must have a license from the State Dairy Commissioner. Frequent visits of inspection are made to all creameries, cream stations, condenseries, and other places where milk is bought in quantities.

Field Work.—These activities, which are provided for in the dairy bill, are calculated to stimulate interest in and promote the advancement of the dairy industry in Colorado. This is accomplished in a variety of ways. Special encouragement and assistance is given in the organization of cow-testing associations. Besides assisting in the problems of organization, the Commissioner is constantly called upon to help locate men to carry on the work of these associations. Colorado is one of only three states which kept up all their associations during the war, the five associations in Colorado going forward without cessation.

Encouragement and assistance is given in every way possible to every movement which has for its object the increase of the number of dairy cattle in the State. Information on the available supply of good dairy stock in other states is kept on hand and readily available to the farmers and stockmen of the State who are interested in importing pure-bred dairy stock. High grade dairy stock to the extent of 30 carloads has been brought into Colorado during the past two years, the Dairy Commissioner's office assisting in the purchase.

A more general manufacture of cheese is being encouraged by the Commissioner and assistance is given in the establishment of creameries and cheese factories wherever they are practicable.

The building of silos is constantly encouraged, personal assistance being frequently given, and aid is often supplied in planning new dairy barns and in selecting equipment.

The work is carried on by a chief deputy, an inspector, and a field man.

State Forester

Colorado has two distinct problems which demand the services of a trained forester. First, the State owns 150,000 acres of forest land, the timber alone on this land being worth approximately \$500,000. The other problem is the encouraging of the people of the State, especially in the plains region, to plant trees, and the right kind of trees. When the State Board of Forestry was created by the Eighteenth General Assembly, these two problems were among the first attacked by the State Forester, who is appointed by the State Board of Forestry. The law creating the State Board of Forestry designated The State Board of Agriculture as the State Board of Forestry. The State Forester is also the professor of forestry at the Agricultural College.

Safeguarding State Forest Land.—The State Forester is at present engaged in a detailed reconnaissance of all the forest land owned by the State, the purpose of which is to establish complete records regarding the exact condition of these lands and the amount and condition of the various kinds of timber found thereon. The survey takes into consideration topography, condition of the soil, and provides for the enumeration of every species of timber found in the State, together with recommendations as to how timber should be cut therefrom to conform to the best forestry practices. This reconnaissance will provide complete and accurate data regarding the exact condition of every acre of the State forest land so that timber sales may be accomplished with these records as a basis without the expense and loss of time necessary to cruise the tract and estimate the timber to be sold.

The actual administration of the forest land is in the hands of the State Land Board and the State Forester serves as technical advisor to this board in all cases where a sale of timber from State land is contemplated. He goes into the field, makes a cruise of the timber, and reports his findings to the State Land Board, upon which they base their prices and arrangements with a prospective purchaser.

Encouraging the Planting of Trees on Farms.—Trees are almost as essential as good farm equipment on the plains in eastern Colorado both from the standpoint of serving as windbreaks and of breaking the monotony of the landscape. Properly constructed windbreaks perform an important function on the wind-swept prairie and the effect of a few attractive trees around the plains home is seriously to be considered because of the greater attractiveness they lend to the home, naturally thereby increasing the contentment of the dweller upon the plains. The State Forester devotes much time to encouraging the planting of trees on farms in the eastern part of the State. He has made a careful study of conditions throughout this district and recommends varieties to be planted and methods to be used in the planting and care

of the trees. To stimulate interest in tree planting, arrangements were made with the U. S. Forest Service for the growing of 30,000 seedlings and transplants of varieties adapted to Colorado conditions. These trees were grown near Monument, Colo., and at Halsey, Neb., and were offered to the farmers of Colorado at actual cost. That interest in tree-planting is increasing was shown by the demand for these seedlings and transplants, which was far in excess of the supply. This project will be continued next year on a larger scale.

State Horticulturist

This office is maintained for the purpose of serving the interests of the fruit-growing and gardening industries of the State. The powers of the State Board of Horticulture were vested in the State Board of Agriculture by the Nineteenth General Assembly. This board appoints the State Horticulturist, who also serves as head of the department of horticulture at the Agricultural College.

The interests mentioned are served by visits to the field, personal consultations, correspondence, and by special projects which are carried on as far as limited funds will permit. One of the principal projects now being carried on by the State Horticulturist is an extensive and detailed survey of the fruit-growing areas of the entire State. This survey will furnish complete and accurate data which will enable the State Horticulturist, the Experiment Station, and the College to more intelligently serve the individual fruit grower. The survey is being carried on in county units and in making it a field man visits every orchard in the county, makes a record of the exact number of trees, the number of different varieties grown, the condition of the soil, methods of irrigation, methods of cultivation, the age of the trees, their condition, and the marketing methods used. A card-indexed record of each and every orchard is made. A survey of Mesa county has been completed and the results published. A survey of Fremont county was completed this year and the results are ready for publication. This work is being done in co-operation with the Colorado Experiment Station.

Through co-operation with the Colorado State Potato Growers' Association, effective work is being done to promote the use of better seed, to standardize varieties, and to improve cultural methods. Colorado is now producing potatoes unexcelled by any other potato-producing region, the output in the State last year amounting to approximately 12,000,000 bushels. This output could be doubled if funds were available for use in stimulating a wider interest in the industry and cultivating a market for Colorado seed potatoes.

*The Colorado
Agricultural College*

*25 minutes!
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*Brief
No. 7*



War Service

The Agricultural College was able to serve the Nation and the cause of liberty in a varied number of ways during the war, and the results accomplished should be largely placed to the credit of the General Assemblies which have represented the people in Colorado during the past eight or ten years, especially the Twenty-first General Assembly. Because the State Legislature had agreed to co-operate with the Federal government in the support of extension work in Colorado and because the Twenty-first General Assembly had provided for a mill levy for new buildings for the Agricultural College and an appropriation of \$10,000 for general extension work along lines which could not be carried on under the Federal activities, Colorado found herself equipped with an effective organization for immediate service on that memorable day in April, 1917, when the word flashed over the country that the United States had entered the world war.

The service rendered by the Agricultural College in the war emergency was along three distinct lines, namely, military, food production and conservation, and co-operation with the State Council of Defense. Because military training has been a part of the curriculum of the Agricultural College since it was first established, the War Department promptly availed itself of the organization available to help train soldiers, and students and graduates in large numbers flocked to officers' training camps when the country first sounded the call for men. It was natural that the State and Nation should turn to the Agricultural College to direct the gigantic work of food production and food conservation which immediately became necessary, because of the organization of the College, the Experiment Station, and the Extension Service, which could be immediately brought into play to push the work forward. It was natural also that the Governor of the State should call upon the Agricultural College for co-operation with his State Council of Defense, especially in connection with the food production and food conservation activities of that State body.

Military Service

Well may Colorado feel proud of the manner in which her youth responded to the call for fighting men, and the reaction of this call among the students at the Agricultural College was particularly inspiring. Although they had entered upon the serious business of getting an education for their life work, and although many of them would have been ready within a few months to embark upon their

careers, they responded almost with one accord in a patriotic abandonment of their hopes and ambitions and an offering of themselves and their talents to their country's service not exceeded by the oft-sung heroes of '76 and '61.

Agricultural College Battery Helped Stop the Huns.—It seemed almost a recognition by Providence of this splendid spirit of Aggie students and graduates that Battery A, 148th Field Artillery, a battery organized at the Agricultural College and made up almost entirely of Agricultural College men, should have been one of the units which helped stop the Huns at Chateau Thierry and St. Mihiel, those memorable battlefields where were won the victories which terminated the war. Battery A first went into action when American troops were first placed in charge of a sector of the battlefield near Chateau Thierry, it was a unit of that famous division whose commanding officer refused to obey an order to fall back but counter attacked in the face of a German advance because the American flag had been forced back a few hundred feet, and from that time, which was the turning point of the great world war, all through the Chateau Thierry fighting, the conflict at St. Mihiel and subsequent battles until the signing of the armistice, the guns of the College battery continued their effective fire.

All through their training in this country, Battery A displayed remarkable skill and accuracy, and when they got to France, they displayed such an ability to adapt themselves to French guns that they were given the largest pieces in use by the French army when they finally went to the front.

Battery A was first organized late in 1915 as a unit of the Colorado National Guard, the organization being accomplished largely by the Commandant of the Cadets of the Agricultural College. At this time the battery was exclusively a Colorado Agricultural College unit and went into its first camp in the spring of 1916 at Camp Carlson, near the foothills west of the College at Fort Collins, where it got its first actual practice with real ammunition. Then came the Mexican trouble and the battery was mustered into the service of the United States Government and spent a summer at the rifle range at Golden in training. Soon after the College term opened in the fall, the battery was mustered out of service and the members returned to their studies and their places on the faculty at the College.

Immediately upon the declaration of the United States to enter the war, the old officers of the battery began the re-organization with practically every man returning to its ranks. This, together with the movement of male students to the training camps, took practically every man physically fit from the student body at the College and a number of important members of the faculty.

Students and Graduates Rushed to Training Camps.—When the nation called for college men to train for commissions as officers in the great army the country

was building, students and graduates of the Agricultural College hurried to answer the summons. To the first training camp after the declaration of war, which was held at Fort Riley, Kansas, the Agricultural College sent 81 men, nearly all of whom won commissions as officers. The success of these men at camp was due to the fact that they had had military training as a part of their work at the Agricultural College.

Military Training at College Expanded.—Realizing the great need which existed and the great crisis which the nation faced, and co-operating with the War Department, the authorities of the Agricultural College provided for an expansion of the military training at the institution, beginning in the fall of 1917, and providing for a more intensive study of military tactics and more attention to military drill and regulations. The staff of the Commandant's office was increased by the War Department. The students were trained in maneuvers, topographical studies, trench digging, and all the important features of army operations and regulations so that when other training camps were established in the winter of 1917 and the spring of 1918, they were better prepared to earn commissions.

693 Men in Service.—When the armistice was signed on November 11, the record showed that the Agricultural College had sent 693 men into the service of the country, 59 of these being at that time members of the Students' Army Training Corps who had just gone to officers' training camps. Of the remaining 634 men who were actually in France, had completed their terms in training camps or were just finishing them, 119 were commissioned officers, including 4 majors, 4 captains, and 111 first and second lieutenants. Out of this same group, 45 men were serving as non-commissioned officers.

How Mill Levy Building Funds Helped

As the war operations of the nation progressed, an urgent need for men trained along certain mechanical lines made itself manifest and the nation called upon the educational institutions of the country to help meet the situation. But for the mill levy fund provided by the Twenty-first General Assembly, the Agricultural College would have found it exceedingly difficult to have met the demand made upon it because it involved the erection of new buildings and the purchase of laboratory equipment and material, entailing the expenditure of a large amount of money.

Training of Soldier-Mechanics.—With the mill levy building fund available, however, and in spite of the fact that it necessitated an abandonment of carefully laid plans for the erection of new permanent buildings on the campus, the College

signed a contract on April 26, 1918, to train 250 men in various mechanical lines and early in May started building operations in preparation for their coming. In this work the College had to assume the responsibility not only of training these soldiers, but of housing them and feeding them. This necessitated the following buildings, which are listed in the order in which they were constructed and with which are given their costs:

	Cost
Auto Shop, 25x100 feet	\$ 1,142.54
Mess Hall, 34x190 feet, with a wing 45x81 feet.....	28,746.68
Horse Shoeing Shop, 30x100 feet	1,946.17
Barracks No. 1, consisting of two barracks, 38x204 feet, connected at the front by a room 24x48 feet and in the center by a room 36x48 feet, with a hospital at the rear 24x36 feet	27,538.63
Barracks No. 2, identical with Barracks No. 1.....	29,297.08
Additional Auto Repair Shop, 30x97 feet.....	1,628.14
	<hr/>
Total	\$90,299.24

These buildings were erected with the funds available from the mill levy authorized by the Twenty-first General Assembly.

The mess hall has a capacity for feeding 500 persons at one time and within a very short period, it being arranged on the cafeteria plan and well equipped with convenient tables and chairs. The most modern kitchen equipment was necessary to make possible the feeding of so many quickly and this, costing \$14,843.00, was purchased from the fund provided by the mill levy. The barracks are capable of accommodating 300 men each and each is provided with ample toilet-room facilities, including opportunities for washing in running water, and shower baths. Provision was also made for a hospital in each barracks. The second barracks was made necessary by the organization of the Students' Army Training Corps, referred to later in this brief.

In order that the work might be rushed with the utmost dispatch and that funds might be utilized to their fullest purchasing power, these buildings were not let by contract but were built under the direct supervision of the College building superintendent. A most commendable patriotic spirit was displayed by the men employed and the officials of the labor unions to which they belonged, union rules regarding holidays and Sundays being waived in order that the construction might proceed with all speed possible. As soon as the framework of a building was reared, an

American flag always appeared at its highest point, where it remained until construction was completed, a silent but inspiring testimonial to the patriotism of the men laboring below.

In addition to the buildings, it was necessary to provide a considerable amount of additional equipment and material besides that of the regular College laboratories in order to carry on the work of soldier training. Equipment of this kind, amounting to \$6,914.29, was purchased from the regular maintenance fund of the College and to the amount of \$2,202.58 from the mill levy for buildings.

Nature of Training.—The first contingent of men, numbering 206, arrived and began its training on June 15. These men were trained in auto mechanics and driving; general mechanics, which included the forge, machine shop, carpentry, pipe fitting, a small amount of electrical work, and a limited amount of concrete work; horse-shoeing; radio operation; and concrete construction. They were trained for eight weeks.

The second contingent, numbering 273, started training August 15 along the same lines and for the same period.

A third contingent, numbering 244, began training October 15 and continued until December 10, completing the prescribed eight weeks. This third contingent was trained along slightly different lines as follows: General mechanics, carpentry, forge, pipe fitting; machinists; auto mechanics; truck driving; radio; and surveying, the concrete work being eliminated on account of weather conditions.

723 Soldier-Mechanics Trained.—Thus were 723 soldier-mechanics trained for service in the cause and their achievements in the camps to which they were transferred after leaving the Agricultural College constitute the best illustration of the thoroughness and high standard of the training they were given. Although in competition with similar detachments who had been trained at some of the largest institutions of the country, the men from the Agricultural College took many of the honors. Many of them were immediately detailed as instructors and the percentage of non-commissioned officers from their ranks was an endorsement of the training they had received.

The members of the Twenty-first General Assembly and their constituents, the people of Colorado, may justly take pride in the fact that almost no criticism was offered by the various corps of inspectors sent by the War Department and the education committee. One inspector went so far as to say that the mess hall and barracks were the best he had seen anywhere in the country. No criticism whatever was made of the educational work and the single corps of inspectors to offer sugges-

tions for improvement of conditions directed their criticism to other phases of the situation.

Students' Army Training Corps Organized October 1.—With the approach of the beginning of the regular collegiate year late in the summer of 1918, the War Department saw the possibility of expanding still further the war service of the educational institutions of the country and organized the Students' Army Training Corps. This organization was so worked out that the soldiers taking the vocational training came under it, as well as the students of the various educational institutions, the plans providing for the vocational work to be continued along the lines already established and for higher academic training, which could be applied to war-time demands, for the regular College students. Under the new organization, the students' division became known as Section A and the vocational division as Section B.

At the request and upon the recommendations of the State Council of Defense, The State Board of Agriculture agreed to the establishment of a unit of the Students' Army Training Corps at the Agricultural College, although it meant a complete reorganization of the academic courses of study and the placing of the institution practically under the control of the War Department, so far as the male students were concerned. It was felt by the College authorities that the situation was such that no sacrifice, no matter how great, should prevent the enlistment of every resource of Colorado to the support of the arms of our country and to the winning of the war for democracy. In response to their country's call, which asked that they combine preparations for military service with collegiate education, 464 of Colorado's young men came to the Agricultural College. Of these, 211 were called to training camps, leaving 253 in training when the armistice was signed. These men were mustered out of service on Dec. 12, and many of them are still pursuing their education at the College.

How Spanish Influenza Was Coped With.—The Spanish influenza epidemic reached the campus just about the time of the induction of the members of the Student's Army Training Corps and presented a problem which called for prompt and effective action. Co-operating with the Military Department, the College authorities spared no expense of time or money in providing every care possible for the young men among the Students' Army Training Corps who became afflicted. A military hospital was immediately established in the barracks, an auxiliary hospital was established in the Civil and Irrigation Engineering building, members of the faculty of the home economics department, assisted by students, established diet kitchens in each of these hospitals, which were maintained throughout the epidemic, and mem-

bers of the faculty and of the student body volunteered and rendered valiant service as nurses. The State organization of the Red Cross and the people of Fort Collins generously co-operated with the College authorities in this work.

Food Production and Conservation

Everyone remembers the urgent call which rang throughout the country from the seat of government at Washington for an increase in the production of food and for the most rigid application of all practicable and known methods of conservation when we entered the war. With the nation enlisted in the cause, entailing the task of feeding an army in the field and with the moral obligation of the United States to her Allies who were short of food, to supply them, a necessity for the production of sustenance for humanity such as has never before confronted a nation was faced.

Bill Passed By Twenty-First General Assembly Speeded Work In Colorado

Providence must indeed have guided the judgment of the members of the Twenty-first General Assembly when they passed House Bill No. 160 providing \$10,000 for general extension work within the State, for this fund, in the hands of the administrators of the Extension Service of the Agricultural College, made it possible for Colorado to speed up her food production machinery and to get herself upon a conservation basis quicker perhaps than many other states in the Union and certainly months quicker than she could have done had this fund not been available.

Twenty Thousand Copies of Emergency Bulletin Circulated Within Five Days.—The first thing to be done was to apprise the people of the State of the situation which confronted the nation and of the vital necessity of each doing his share, and to tell them how this could be done. The declaration of war came late in the planting season and at a time when the help of the faculty of the College, of the Experiment Station staff, and of the Extension Service specialists was invaluable in increasing the production of food. The newspapers of the country were, of course, carrying the news of the necessity, but in such an emergency as then existed, it required statements from the U. S. Department of Agriculture and the Agricultural College to bring the people of the State to a full and complete realization of the real and vital necessity for prompt and unselfish action.

An eight-page bulletin, calling the attention of the people of the State to the necessity for increasing the production of food and carrying with it suggestions regarding the means whereby this could be accomplished, was immediately prepared at the Agricultural College. This bulletin designated which of the grain and forage crops could be increased in acreage at that season of the year, how the meat supply

might be increased and how even the dwellers in cities and towns might help by growing vegetables for their own consumption. Twenty thousand of these bulletins were in circulation over the State of Colorado within five days from the receipt of the news that Uncle Sam had joined the Allies.

Organization of the Extension Service Gets Behind Campaign.—The entire staff of the Extension Service of the Agricultural College, including 12 county agricultural agents and the various specialists, immediately directed all their energies to enlisting the aid of the farmers and to assisting them wherever it was possible.

Farmers in Unorganized Territory Enlisted in Work.—Outside of the area served by county agricultural agents there was a vast territory of agricultural land in the State which presented a serious problem. It represented a great potential factor for increasing the production of food, but there was no organization through which the work could be properly carried out. Here again, and perhaps in the biggest way, did the funds provided by House Bill No. 160 prove a godsend. The territory referred to was divided into four districts:

District No. 1.—Sedgwick county, Phillips, Yuma, Washington, and Arapahoe.

District No. 2.—Elbert county, Lincoln, Cheyenne, Kiowa, Crowley, Otero, Bent, Prowers, and Baca.

District No. 3.—Grand county, Routt, Moffat, and Rio Blanco.

District No. 4.—Eagle county, Pitkin, Mesa, Montrose, and San Miguel.

With the funds provided by House Bill No. 160 to provide transportation and to defray expenses, four men from the College faculty, with special training for the particular districts to which they were assigned, went into this territory and served the districts as county agricultural agents serve their counties, throughout the summer. Two agronomists were sent to the districts lying in the plains region of the State; an animal husbandry specialist was sent into the cattle country of Routt, Moffat, and Rio Blanco; and a horticulturist was sent into the fruit country of Eagle, Pitkin, Mesa, Montrose, and San Miguel.

Bulletins and Newspapers Help.—Throughout the summer bulletins containing information bearing upon the emergency were published and much valuable information disseminated through the newspapers.

Losses from Crop Pests and Diseases Prevented.—With such an urgent need for every bushel of wheat, every bushel of oats, every bushel of corn, and every bushel of barley that could possibly be produced, the protection of these crops from the devastations of insect pests and plant diseases was vitally important. Specialists were therefore sent into the field and campaigns waged to protect the crops from

grasshoppers and other insect pests and to aid in the elimination of smut from grain crops so far as possible.

Methods of Conserving Food Explained to Housewives of State.—With the approach of the harvest season, it became necessary to launch an extensive campaign over the State to assist the housekeepers in their patriotic desires to help conserve the nation's food supply by canning and drying. Knowledge of practical and reliable methods of accomplishing this was extremely limited and the housewives of the State were found eager for the information thus brought to them. Five demonstrators from the organization of the boys' and girls' clubs division of the Extension Service spent the summer of 1917 in the field throughout the State giving practical demonstrations of canning, while representatives of the Home Economics Department and the Horticultural Department lent assistance in disseminating information regarding the drying of vegetables in the home and the establishment of community driers. This work was also carried on through the summer of 1918. Special schools, extending over a period of a week, were held at the Agricultural College for the instruction of volunteer workers who were aiding in this patriotic work in their communities.

Silo Campaign.—The silo represented one of the most effective means of accomplishing conservation of the feed crops. Vigorous campaigns were therefore waged among the farmers of the State to encourage them to build silos.

Conservation Predominant Theme in Stock Show Exhibits.—The National Western Stock Show presented an admirable opportunity for the College to reach a large number of people not reached through ordinary channels. Conservation of food was, therefore, the predominant theme in the exhibits of the College at the Stock Show in January, 1917, some important and vital lessons being thereby presented in a graphic way direct to the people.

All of This Work Supported by House Bill No. 160.—All of the work outlined in the preceding paragraphs under the heading of food production and conservation was supported by the funds available from House Bill No. 160. As has been previously stated, without this fund no such an ambitious program could have been entered upon nor put into execution so quickly.

Federal Emergency Food Production Bill Aids Work

In August, 1917, the National Congress passed a bill providing funds for the support of emergency work in food production and conservation to be carried on by the U. S. Department of Agriculture. This department carries on its work in Colorado in co-operation with the Extension Service of the Agricultural College and this

enabled Colorado to greatly enlarge her activities. It made it possible to establish county agricultural agents in a large number of counties not being so served. In co-operation with the counties, the number of these agents has increased until now there are 29 in the State as against 12 at the time the United States entered the war. Of these 29, 16 are at present supported by emergency federal funds in co-operation with funds appropriated by the counties, and 13 are employed upon the regular basis established by the Smith-Lever act.

Emergency Home Demonstration Agents.—Until the passage of the federal emergency bill there were no county or city home demonstration agents in Colorado. This work, so vital to the success of food conservation, was being carried on by one specialist. With the emergency funds and the co-operation of the counties and cities it was possible to greatly extend the work in this direction and at the time of the signing of the armistice there were eight emergency home demonstration agents in Colorado, three serving the women in the cities and five serving in as many different counties.

Emergency Specialists.—Emergency specialists in animal husbandry, poultry production, pest eradication, and animal diseases were sent to this State by the U. S. Department of Agriculture to co-operate with the college. Details of their work are reported in the brief devoted to the Extension Service.

Work Still Continues.—A second emergency bill for the continuation of this work until July, 1919, was passed by the National Congress in November, 1918, and all of the activities under the emergency appropriation will be carried forward until July 1, 1919.

Boys' Working Reserve.—During the summer of 1918, with indications pointing to a shortage of farm labor when the harvest season should arrive, members of the United States Boys' Working Reserve were sent to various institutions for the purpose of getting some elementary training in the work of the farm so that they might assist in the harvest. Co-operating with the State Council of Defense the Agricultural College trained 50 Colorado boys from the cities of the State. These boys came to the College, were housed and fed while here, and given two weeks' training in the more simple duties of a farm hand such as harnessing a horse, caring for a horse, driving a horse and team, feeding and care of livestock, the operation of some of the more simple farm machinery, and a small amount of training in harvesting problems, such as the handling of hay and other field crops.

Co-Operation With State Council of Defense

Realizing that only through the co-operation of all agencies could such a task as confronted the State be efficiently and effectively performed, the Governor in organizing a State Council of Defense early sought the co-operation of the Agricultural College. Direct co-operation was immediately established in the following manner:

The President of the College was made a member of the Council of Defense and Chairman of the Committee on Food Production, Conservation and Marketing.

The Specialist in Farm Management was appointed chairman of the Advisory Committee on Farm Labor.

The Professor of Agronomy was made chairman of the Advisory Seed Committee.

The Professor of Farm Mechanics was appointed chairman of the Advisory Committee on Tractors.

The Specialist in Marketing was made chairman of the Advisory Committee on Markets.

The Director of the Extension Service was made a member of the Council Committee on County Organization.

The Professor of Home Economics was appointed a member of the Advisory Committee of the Women's Council of Defense.

In order that the Council of Defense might have the benefit of the technical knowledge and judgment of the Agricultural College, Experiment Station, and Extension Service staffs, and in order that these agencies might be kept closely in touch with the activities of the Council, thereby avoiding duplication of effort, an emergency staff was organized at the College and held meetings on Monday of each week, the day preceding the weekly meetings of the State Council of Defense. This staff was composed of the following:

The President of the College

The Director of the Experiment Station, who is also State Entomologist

Director of the Extension Service

State Dairy Commissioner, who was vice-chairman of the Advisory Committee on Livestock

State Horticulturist

Agronomist, who was also chairman of the Advisory Committee on Seed

Farm Management Specialist, who was chairman of the Advisory Committee on Farm Labor

Professor of Farm Machinery, who was the chairman of the Advisory Committee on Tractors

Head of the Department of Home Economics, who was also a representative of the Federal Food Administration and a member of the Advisory Committee of the State Food Administration

State Leader of County Agricultural Agents

State Leader of Urban and Rural Home Demonstration Agents.

The members of this staff, meeting weekly as they did, to consider the rapidly changing conditions and unexpected problems which presented themselves, were able to be of material assistance to the Council of Defense, and throughout the work of that body every agency of the Agricultural College, including the faculty of the College, the staff of the Experiment Station, the specialists of the Extension Service, the county agricultural agents, the county home demonstration agents, and the urban home demonstration agents, co-operated with the Council in every way possible.

Throughout the period of the war, with responsibilities in many cases more than double those of peace times, the spirit of every worker of the College organization was most commendable. Every man and woman gave unselfishly of his time and energies, not only cheerfully working night and day whenever necessary, but never refusing to assume an additional load if it would help the cause.

*The Colorado
Agricultural College*

*The last!
And--
Only 21 minutes
long!*

*This brief con-
tains an index--*

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where it will be
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*Brief
No. 8*

*Including
Index*



NEEDS

The Twenty-first General Assembly increased the maintenance for the State Agricultural College, for the Experiment Station, and for the Extension Service; provided a building fund, in connection with the other state institutions of higher learning, for a ten-year period; and made a special appropriation for farm improvements at the Fort Lewis School. The State Board of Agriculture feels great satisfaction in not being under the necessity of asking for an increase in either maintenance or building funds. In fact, so well did the Twenty-first General Assembly provide for the institutions under the control of the board that they have been able to meet the needs of the State under war conditions in a most gratifying manner; and the board feels that the work of education, research, and extension can be carried forward satisfactorily meeting the growing needs of the State on the income provided for the next two years.

Lands in Fort Lewis Reserve Should Be Developed.—Additional funds should be provided for developing the lands in connection with the Fort Lewis School, a magnificent reserve of 6,400 acres, wonderfully well adapted for experiments in high-altitude agriculture, both under dry-farming and irrigated-farming conditions.

Law Providing for the Investment of Land Grant Funds Should Be Made Operative.—There is grave need also for an amendment to an act passed by the Twentieth General Assembly (See session Laws, 1915, page 17), providing a definite method for the investment of the so-called Land Grant Fund, that is, funds derived from the sale of the 90,000 acres of land granted the State under the terms of the Federal Act establishing the land grant colleges. About one-half of these lands have been sold, and the State now has invested, in accordance with the terms of the Federal Act, \$230,759.36. When the Congressional Act was accepted by the State of Colorado, the terms of acceptance provided that full and complete acceptance, ratification and assent is hereby made and given by the State of Colorado, to all of the provisions, terms, grants and conditions, and purposes of the grants made and prescribed by the act of congress of the United States, entitled "An act to apply a portion of the proceeds of the public lands to the more complete endowment and support of the colleges for the benefit of agriculture and mechanic arts, established under the provisions of an act of congress, approved July 2, 1862. (L. 1891, p. 18,

sec. 1; sec. 86, R. S. 1908, p. 200). However, no provision was made for the investment of the Land Grant Fund. This was invested as other school funds are invested, by the State Treasurer. As long as the legal rate for the State was 5 percent, it met the terms of the Federal Act, but when the rate was reduced, especially when some of the funds were not invested, an increasing amount of interest was lost.

Under insistent requests from the Department of the Interior that the terms of the original Act be complied with, the Twentieth General Assembly passed a law to provide means for the investment of the Land Grant Fund and for guaranteeing the interest. The loss in interest up to that time exceeded \$50,000, for which the State is morally responsible. In order to provide against such loss of interest, the Twentieth General Assembly, in addition to providing for the investment of the fund, provided the following means for meeting any deficiency in interest (Section 5): "The State Board of Agriculture, on or before the 15th day of December, immediately preceding the convening of the General Assembly, shall make a report to the Governor showing the condition of said fund, the investment thereof, the security taken therefor, and the amount of income derived therefrom, and such report shall be by the Governor submitted to the General Assembly, and if such reports show that said fund has not earned five per centum per annum, an amount sufficient to cover such deficiency shall be and is hereby appropriated, as of the first class, to be used for the purposes contemplated and prescribed by the said Act of Congress of 1862." (Session Laws, 1915, page 19).

The law has worked well with one exception. It was found two years ago, too late to introduce a bill for amending it, that Section 5 was deficient because it provided no way for transferring the money appropriated for paying the deficiency in interest, from the General Fund to the so-called Land Income Fund, subject to the order of the State Board of Agriculture. This defect in Section 5 should be remedied, in order that complete and positive assurance can be given the U. S. Department of the Interior that the State is complying, in spirit and in letter, with the terms of the original Land Grant Act.

Assistance Needed in Administration of Vocational Education.—The Twenty-first General Assembly accepted the provisions of an act passed by the Sixty-fourth Congress and signed by President Wilson February 23, 1917, providing for nationwide promotion of vocational education in co-operation with the states, generally known as the Smith-Hughes Act, and designated the State Board of Agriculture as the state board for administering this act in Colorado. (See Session Laws 1917, Chapter 150, Page 536.)

No appropriation was made, but the board was given power to use funds provided for the maintenance of the institutions under its control for defraying the cost

of administration. This important work is becoming well established in the State, and naturally the cost of administration is growing. The State Board of Agriculture will appreciate it if the Twenty-second General Assembly can give it some financial assistance in carrying the cost of administration.

Recommendations

The declaration of war found Colorado well prepared for meeting the calls for national service. She has met every request in a way highly gratifying to her citizens and very satisfactory to the National government. The war has demonstrated both the strength and the weakness of our state organization, and has indicated where improvement should be made. Furthermore, it is the belief of the State Board of Agriculture that Colorado is entering an era of great agricultural and industrial development and that it is advantageous for the State to strengthen some of its agencies for more effectively meeting the increased work that this development will naturally bring.

With the development of agriculture, the State must give more attention to safeguarding the industry against losses from insect and rodent pests and plant and animal diseases, and more attention to inspection and regulatory service by necessary state agencies.

The General Assembly will no doubt give much attention to plans for settlement of lands and for providing farms for the returning soldiers, and it is with an earnest desire to assist in this program of development that the following recommendations are made.

Colonization.—Under this program consideration must first be given to making our lands available for settlement; and second, to strengthen our agencies for assisting the settlers in making a success of their colonizing plans.

Reorganization of Irrigation Districts.—In making the land available for settlement, the most important matter for consideration is how to put the state irrigation districts on a definite business basis. No matter what plan of colonization is decided upon, unless these state irrigation districts are removed from their present inactivity and inability to progress, the plan is doomed to failure from the start. In a way, the proper settlement and adjustment of these irrigation districts, and plans to put them on a definite business basis, form the keystone to the arch of our further agricultural settlement and this board trusts that the General Assembly may devise some means whereby a commission may be provided for doing this most important work. We trust also that this step may be followed by an act providing

for a definite means for State aid in colonization, patterned possibly after the California plan, as inaugurated two years ago.

Agricultural Statistics.—Closely allied with the availability of land for colonization comes the need of accurate agricultural statistics. The war has emphasized the need of accurate information regarding the acreage and production, and has demonstrated how little the State is doing to secure this necessary information. With increased development, the need for this information will be as great in peace time as it was during the war. The law providing for the gathering of agricultural statistics, which has never been operative, should be so amended that definite and complete information regarding the agricultural industry of the State may be available.

Rural Schools.—In addition to the natural advantages of soil and climate, Colorado must provide for the community life of her prospective settlers. Too much attention can not be given to the development of our educational system, particularly the rural schools. People will not come to a State that does not offer good educational facilities to its children, and one of the strongest factors that is crowding the people from the open country to the towns and cities is the unsatisfactory country school. This board cannot emphasize too strongly the need of better schools. The consolidated school has shown what is possible; the State is making commendable progress. This can be increased through wise legislation.

Full Advantage Should Be Taken of Federal Aid in Vocational Education.—Furthermore, in co-operation with the federal government through the Smith-Hughes Act, the State has a wonderful opportunity for developing vocational education below collegiate grade; for providing instruction in agriculture and in home economics in the high school in the agricultural sections of the State, and for training in trade and industrial subjects, for night schools, and continuation schools in our cities and industrial centers.

The State is under obligation to meet the appropriation made by the Federal government on a dollar-for-dollar basis, and is doing so now through special contracts with the several school districts. However, the federal act clearly presupposes that the State itself will meet this appropriation on a dollar-for-dollar basis, and thus assist in the more extensive promotion of vocational education.

The war has demonstrated the weakness of our school system in vocational training. The natural development of our agriculture and of our trades and industries requires that the schools give training for this work. The State has no better opportunity for getting large returns from the investment made, since for every dollar of state funds used, a dollar of federal funds and a dollar of local school district funds,

together with the cost of equipment and buildings supplied by the local districts will be used in this important work. No investment promises more for the economic, industrial, civic and social development of our State; no plan will do more to truly extend the work of the high school and make of it a service bureau for the community.

It is hoped by the State Board of Agriculture that the General Assembly may see its way clear to take full advantage of the provisions of the Smith-Hughes Act and definitely commit itself to the principle that the State shall assist in the promotion of vocational education, and thereby strengthen the educational opportunities of the children of the State who must go into the industries early with little opportunity for further training.

Better Means of Protecting Crops From Insect and Rodent Pests Needed.—The funds available for the work of the State Entomologist should be increased. The need for this will be readily recognized after a perusal of the report of the work of this official contained in Brief No. 6. Quarantines are being established by a number of states against Colorado products raised in sections where certain insect pests are known to exist, and they are bound to increase, placing a serious handicap upon the producers in the sections affected. These quarantines call for a vast amount of inspection and aid to the producer in complying with their regulations.

As was doubtless noted in reading Brief No. 6, the alfalfa weevil, an insect most destructive to the alfalfa crop, has made its way into Colorado and every means available should be exerted to prevent its spread over the State and to stamp it out if possible. It is now confined to a very small area, but it spreads with great rapidity and, when it is realized that its inroads into the alfalfa crop frequently cut down the yield as much as 50 percent, the importance of vigorous methods for its control needs no further emphasis.

To refresh your memory, we would recall to your attention, as stated in Brief No. 6, that there are 11,314,158 acres of land in Colorado infested with prairie dogs, which are annually causing a loss of \$1,250,000. With funds at present available, although they have been augmented by the heartiest co-operation on the part of land-owners, it has been possible to undertake the extermination of these pests on only 2,000,000 of these acres. Further explanation or emphasis of the need here would be superfluous.

More funds are also needed for the extermination of grasshoppers, for the control of fruit-tree and plant insect pests and for the other activities of this important state office outlined in Brief No. 6.

Work of State Dairy Commissioner Should Be Strengthened.—A larger appropriation should be provided for the work of the State Dairy Commissioner. This immediately becomes apparent when the growth of the dairying industry during the past four years and the possibilities for future development are considered.

The output of dairy products in Colorado has increased until now it amounts to \$20,000,000 annually. A large part of this growth has been made in the plains districts of eastern Colorado, where dairying has proven the means of putting farming operations in that dry-land territory upon a permanent basis. It has actually amounted to the difference between success and failure in many of the dry-farming sections. This increase in da rying activities has resulted in a large increase in the number of cream shipping stations which, of course, has meant more work for the inspection force of the State Dairy Commissioner, for this official is charged not only with the duty of protecting the consumer from impure and adulterated products, but he also must see that fair and equitable methods of testing are observed in order that the producer will get a fair and just price for his products. Although the industry has shown this rapid growth during the past four years, it has not been possible to increase the inspection force of the Commissioner's office because of limited funds, and the increase in the cost of maintaining the service, especially in regard to traveling expenses.

Besides the growth attained in the plains districts there have been greatly increased activities in other sections of the State, even including the fruit-growing districts of the Western Slope, where the farmers are learning that a herd of cows materially helps to insure a profit from their farming operations.

Besides this growth in the industry itself, there has been a steady increase in the work to be done in regulating the manufacture and sale of substitutes for dairy products during the past two years. The Colorado law regarding the sale of oleo-margarine is very explicit and has been so administered by the Dairy Commissioner that it is now complied with to the letter. During the war period, a large number of new dairy products substitutes have been sent onto the market, such as cocoanut butter and imitation condensed milk made from cocoanut. These must all be carefully watched in order that the interests of Colorado consumers and producers may be served.

In addition to the work of inspection and regulation, the Dairy Commissioner is charged with a certain amount of field work, designed to stimulate the growth of the industry in the State. The organization of cow-testing associations has been one of the important phases of this work and it has been carried on so effectively that Colorado now has five live organizations of this character, ranking among the foremost

states in the Union for the number of associations in relation to the number of dairy cattle.

During the past few years, the standards of dairying have been placed upon a very much higher plane in Colorado through the importation of pure-bred dairy stock. A campaign with this for its object was launched by the Dairy Commissioner several years ago, the aim being not only to interest Colorado farmers and dairymen in better dairy stock, but to give them technical assistance in obtaining it. Representatives of the office have personally assisted in this work by accompanying purchasing committees to eastern dairying centers to assist in the purchase of stock. This constructive piece of service is now well under way, many carloads of stock have already been brought into Colorado, and the extent to which it can be carried on will be limited only by the funds available.

With the growth of the dairying industry, new marketing problems are naturally presented, as well as the establishment of new manufactories of dairy products. Among the latter, the manufacture of cheese is the most promising and presents an important problem which must be met if funds will permit.

Work of the State Horticulturist Should Be Increased.—The re-establishment upon a permanent basis of one of the State's most important agricultural industries now facing a decline, and the future success of two other important lines of agricultural production depend very largely upon whether or not the State Horticulturist is provided with funds which will enable him to serve those engaged in them and assist in working out their problems. The industries referred to are fruit growing, truck gardening, and potato growing.

Colorado must face the fact, unpleasant though it is, that her fruit-growing industry is at its most critical period; that it is, in fact, facing a decline. No longer are the orchards of the State producing as they did a few years ago, either in quantity or quality, and no longer are the individual orchards proving so profitable. Studies must be made of orchard management, including cultural methods, soil fertility, cover crops, pruning and spraying, and some real assistance must be given the growers with their marketing problems. All these problems must be attacked, not only from the standpoint of the state-wide industry as a whole, but also from the angle of the individual orchardist.

With a proper standardization of variety, standardization of cultural methods, and stimulation of the market demands for Colorado products, this State can become the second or third state in the Nation in the production of the highest grade of potatoes. This is true not only of potatoes sold for food, but especially true of seed potatoes. During the past year, potato growers in Colorado produced 12,000,000

bushels and it is estimated that during the year 1917 the production amounted to between 16,000,000 and 18,000,000 bushels, although growers were unable to realize on such production because of excessive losses caused by frost and by shortage of shipping facilities.

Colorado-grown seed potatoes are superior, especially in vitality, because of the high altitude conditions under which they are grown, and are very much in demand in potato-growing regions of the South where they are unusually productive. This high quality, coupled with the very advantageous geographical location of the State in relation to the southern field, promise rapid and profitable development in potato seed production in Colorado during the next few years if some state agency is enabled to stimulate the industry here and help the producers find and keep in touch with the market.

With an increase in the appropriation for the State Horticulturist that official can give greater assistance to present growers in their efforts to standardize their varieties and practice proper cultural methods, he can help cultivate and build up the market for Colorado-grown potatoes and can very materially stimulate a wider interest in potato growing in the State.

A greater interest in truck gardening in Colorado should be stimulated and in the progress that has thus far been made problems which require technical and official attention have arisen. The possibilities for the development of this industry are such that, according to an authority who has made a careful study of the situation and knows whereof he speaks, the truck gardening industry in Colorado could be made to eclipse the fruit-growing industry. Colorado can actually compete with the growers of winter vegetables in the central states; winter vegetables can be grown in Denver under glass, transportation paid to Chicago and the products can compete with those of the growers in the immediate vicinity of that city. This is true because fuel is cheap in Colorado and, with the aid of the bright sunshine, vegetables can be grown very much quicker.

Outdoor truck gardening is already being engaged in quite extensively in Colorado, celery, cabbage and cauliflower produced in this State being very much in demand all over the country and especially in the South. This phase of the truck gardening industry can be very greatly enlarged, if funds are provided.

During the national campaign to conserve food because of war needs, much attention was paid to the dehydration of vegetables, and to the dissemination of information regarding the preparation and use of dehydrated products. Dehydration has proven so successful, and dehydrated products have proven so economical and satisfactory to the housewife, that the industry is here to stay. This means exten-

sive expansion for both the potato-growing and truck-gardening industry because it will greatly increase the demand for these products.

The State Horticulturist is the logical state official to carry on this important work. With the limited funds of only \$1,200 a year, as allowed at the present time, he finds it impossible to meet the calls for assistance.

✓ *State Standardization and Inspection of Agricultural Products Would Mean Surer Markets and Better Profits for Colorado Producers.*—Colorado is an exporter of food products. This exportation has reached proportions that unquestionably justify the establishment of a central agency for the standardization and inspection of agricultural products. Indeed, such an agency would not only be justified by present conditions, but it would have a very salutary effect upon the future agricultural development of the State by more definitely assuring a market for the producer and a price for his product which would bring him a definite and reasonable profit. Such an agency would enable the producers of the State to comply with the standards laid down by the United States Department of Agriculture and the various marketing centers, a thing they cannot do at present.

This is especially true of the potato-growing industry. Colorado potato growers although they are producing a product as high in quality as any other potato-growing district in the United States, are at a distinct disadvantage because the State has established no official means of inspecting their output, which naturally results in practically no standardization and grading. The state of Oklahoma, for instance, has recently established standards for all imported potatoes and requires an official certificate of inspection with each and every shipment of potatoes into the state. These regulations absolutely prevent Colorado growers from marketing their potatoes in Oklahoma because the State has no machinery for making the necessary inspections and issuing the proper certificates. Colorado can become one of the three or four leading potato-growing states of the country if she makes the most of her opportunities, but standardization and official inspection are absolutely necessary to such an attainment.

The advantage of official standardization and inspection would be just as great to our other agricultural industries as it would to the potato growers of the State.

Receipts and Disbursements for the Biennium 1917 and 1918

	Receipts	Expenditures
Balance on hand Dec. 1, 1916.....	\$ 67,641.39	
For Resident Instruction— (Administration, Instruction, Maintenance (Bldgs., Campus, Farms, Livestock)		
From Tax Levy.....	285,892.06	
From Federal Funds.....	100,000.00	
From Student Fees.....	41,359.33	
Miscellaneous, Farm, Live- stock, Reimbursement for War Training.....	116,860.46	
Land Income.....	26,548.12	
Total.....	\$ 570,659.97	\$ 569,006.15
For Rural School Improvement....		5,750.00
For Research and Investigation—		
From State Tax Levy.....	\$ 76,892.49	
From Federal Funds.....	60,000.00	
Miscellaneous.....	26,226.47	
Total.....	\$ 163,118.96	\$ 147,876.26
For Extension Service—		
Federal Smith-Lever.....	\$ 45,560.63	
State Funds.....	30,000.00	
From County Funds.....	19,988.89	
Total.....	\$ 95,549.52	\$ 91,262.11
“House Bill 160” State Extension..	20,000.00	20,000.00
Buildings and Improvements—Tax Levy—		
Erected for War Training... (Still due from State Treas- urer about \$30,000).....	85,495.20	117,097.00
For Fort Lewis School—		
Instruction, Maintenance, Admin- istration.....	79,767.73	71,665.65
Improvements—Appropriation..	15,000.00	15,000.00
Tax Levy.....	14,249.20	17,280.08
(Of Tax Levy, still unpaid, about \$3,000.00).....		
For Teller School Drainage.....	5,000.00	5,000.00
Smith-Hughes Work, (Vocational Education) Federal Funds....	15,000.00	11,070.84
Pure Seed Work.....	9,500.00	9,500.00
State Boards and Commissions—		
Horticulturist.....	2,500.00	2,500.00
Forester.....	10,000.00	10,000.00
Balance on hand Nov. 30, 1918..		\$ 60,473.78
Total.....	\$1,153,481.97	\$1,153,481.97

(Entomologist and Dairy Commission paid direct from State Treasury, not passed through college budget).

The work done with the funds is carried under a comprehensive budget system, with expenditures classified by departments and under the classification required by the federal government for federal funds and by the State Board of Agriculture for state funds.

Complete and detailed information on any or all funds will be gladly furnished on request.

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