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SPECIAL REPORT
—ON—
AGRICULTURE

BY
The State Board of Regents



CHARLESTON, WEST VIRGINIA,
1912

PART TWO

SPECIAL REPORT

—ON—

Agriculture and Domestic Science

MADE BY

THE STATE BOARD OF REGENTS

TO THE

GOVERNOR OF WEST VIRGINIA

NOVEMBER 21, 1912.



DEPARTMENT OF SCHOOLS
CHARLESTON

STATE BOARD OF REGENTS

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PLAN OF REPORT ON AGRICULTURE AND DOMESTIC SCIENCE.

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2. Agriculture, our greatest asset.
3. Agricultural conditions and possibilities.
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 - (b) Our possibilities.
4. How shall we improve our agriculture and rural life?
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 - (b) By reaching the coming generation.
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 - (b) Through extension work.
 - (c) Through the normal schools and other secondary schools of the State.
 - (d) Through high schools.
 - (e) Through elementary schools.
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THE PURPOSE OF THIS REPORT.

This special report has for its purpose the discussion of the relation of the schools under the management of the State Board of Regents to the social and industrial development of the state with special reference to agriculture and domestic science. There is no disposition on our part to neglect any department or phase of the work which is being carried on in the eleven state institutions with which we are officially connected. Indeed we fully realize that each branch of work or study fills some particular need of our state, and we earnestly urge our lawmakers to give careful consideration to the various recommendations made in the formal reports found in Part One. However, all of these matters cannot be discussed in detail, hence we have deemed it wise to bring together with much care many facts, opinions and recommendations relating to agriculture and domestic science—two of the most important departments which have been much neglected in the past.

Inasmuch as this report will fall into the hands of the members of the Legislature, we have adapted its contents to what we believe to be the essential characteristics of the legislation to which a lawmaking body should give its first and best attention. In our judgment, those characteristics are as follows:

1. *Application to a large percentage of our citizenship.* Fully 70 per cent of the people of West Virginia live on farms and all of our population live in homes, hence any legislation that directly or indirectly makes for better farming and home-keeping will be comprehensive in its influence.

2. *Provision for the future.* The savage cares only for today and its needs. The civilized man looks to the future. A state which is supposed to be unlimited in the length of its life, should work on a program covering long stretches of the future. Belief in the foregoing statement is our excuse for outlining in this report more than can be accomplished in one or two years, and for asking for material equipment beyond our immediate demands.

3. *Effective provisions for extending the influence of the law to the units of the citizenship—the individual.* In many places in the following pages will be found discussions and references pertaining to institutions and activities over which the Board of Regents has no control. We have thus trespassed in order to show our ideas of the entire ramifications of desirable laws relating to the topics under special consideration.

We fully realize that many and diverse demands are made upon you as Governor, and that confusing numbers of worthy and unworthy propositions are laid before you and the members of the Legislature for consideration. Realizing these conditions, we have endeavored to set out with brevity, and as much clearness and force as we could command, the propositions which we think worthy of consideration and the facts supporting these propositions. For the sake of convenience and emphasis, we use many tables of comparisons, illustrations and diagrams. With such purposes in mind, we hope to make the pages which follow worthy of careful consideration.

THE STATE'S GREATEST ASSET—AGRICULTURE.

After all, the school question is a business proposition. Our schools seek to make life richer and better, but our life is rooted in, and grows out of economic conditions. Just as the flower gets its life from the soil below, so the best aspects of our lives must be supported by business conditions which, like the soil, in themselves may not seem especially essential or attractive. In short, our first duty as a state is to see that all of our citizens have an abundant opportunity to get their daily bread. Nature has so blessed us in West Virginia that this has never been a pressing problem in the past. Even now, we are in the midst of plenty and prosperity, but our statesmanship and farsightedness will be shown if we pause now to consider means by which this prosperity may be made perpetual. If the question is to be attacked in a business-like way, we must plan and legislate with reference to the main bases of our wealth. In seeking these main supports we are compelled to notice first our agricultural interests.

It is quite impossible to make a complete inventory of the wealth in the farms of West Virginia, but the following figures taken in round numbers from the books of the State Tax Commissioner and the report of the Thirteenth Census will give some idea of the extent of this branch of our state's business.

West Virginia has 96,689 farms. These farms with the buildings on them are valued at.....	\$400,000,000.00
All other real estate in West Virginia is valued at.....	200,000,000.00
or one-half as much as the farms.	
The implements and machinery on these farms are worth more than	7,000,000.00
The census takers found on these farms live stock valued at more than	43,000,000.00

If we had a system of factories in the state with plants aggregating such an enormous investment, we would do much to encourage them and to increase their output, but the farms with all of their importance and possibilities are among the common blessings which we are too likely to overlook. In this connection it will be interesting to look briefly at some of the production of our farms as shown by the 1910 census. The amounts are much larger now as these figures are based upon the crops of 1909.

Our Farmers Reported (1909 Census)

620,288 Cattle valued at	\$ 15,860,764.00
191,808 Horses and Colts valued at	19,948,697.00
328,188 Hogs valued at	2,087,392.00
910,360 Sheep and Lambs valued at	3,400,901.00
3,310,155 Chickens and other Fowls valued at	1,628,700.00
17,119,097 Bushels Corn valued at	11,907,261.00
2,575,996 Bushels Wheat valued at	2,697,141.00
1,728,806 Bushels Oats valued at	912,388.00
533,670 Bushels Buckwheat valued at	351,171.00
148,676 Bushels Rye valued at	122,258.00
639,104 Tons Hay and Forage valued at	7,492,747.00

4,077,066 Bushels Potatoes valued at	2,278,638.00
14,356,400 Lbs. Tobacco valued at	1,923,180.00

While the table above shows the main items of our annual production, it does not show a very large number of the less important products which add a large aggregate to our total farm output.

We are not unmindful of the fact that our annual sale of coal and oil shows figures equally large. We rejoice in this, yet we cannot forget that the empty mine will never produce another ton of coal, and that the exhausted sand will supply no more oil. On the other hand, we call attention to the wonderful wealth in that quality of the soil which makes it produce, under favorable treatment, generation after generation.

It doesn't take much of an economist to trace most of our wealth back to the soil. For convenience, large numbers of our people congregate in towns and cities, but large percentages of them spend their time in manufacturing, handling, and buying and selling the things which come from the farm. These towns and cities boast of their business and prosperity, but let the plow and reaper of the quiet farm stop for one short summer, and these bustling people in the centers of population would be brought to want. The dependence of the cities upon the rural sections is being recognized by the wide-awake Boards of Trade that are raising money to pay experts to go out into the open country to instruct and encourage the farmer. The Board of Trade of Charleston is now helping to pay the salary of such an expert, and such cities as Wheeling, Parkersburg, Fairmont, Huntington, and Bluefield are making plans to bring increased prosperity to themselves by helping to increase the productiveness of the surrounding country districts. If these commercial bodies consider these investments good, how much more can the state afford to give special attention and encouragement to this largest branch of its business.

Rural Population as an Asset.

People as such are worth much. Since the days of slavery we have lost sight of the intrinsic value of a man. For what work he can do, and for what general service he can render the community and state, an average young man of 25 or 30 if put upon the block and sold at public auction, would bring about \$3,000.00. From this standpoint a large percentage of our wealth lies in purely rural sections.

The figures below will indicate our asset in rural population, and suggest the measure of our opportunity and responsibility toward them.

Rural Population in W. Va. (1910)

The Census Bureau considers all population in rural districts and in towns of less than 2500, as rural. In 1910 this number was....	992,877
Subtracting the number in all incorporated territory, we have left in the purely rural sections	860,479
Per cent of our population which is purely rural	70.5
Estimated number of children of school age now growing up in the rural homes of W. Va.	286,000

In considering the distribution of our population, we must give the rural sections credit with a large number of the persons living in the towns and

cities. If the reader doubts this, let him begin to inquire into the early life of the influential men whom he meets on the streets of our West Virginia towns and cities. Most of those men were brought up on the farm where they secured the elements of character which are making them useful forces in the crowded, complex society of the town or city. So we are forced to conclude, since 70 per cent of our population now lives in rural territory and a large proportion of our best urban population comes from the same source, that our institutions owe this class generous and especially directed attention.

Asset in Rural Health Conditions.

A building lot in an airy, dry, healthful part of the city is worth much more than a lot of the same size in a damp, malarial, unhealthful part of the same city. This self-evident statement is made to call attention to the wealth represented by healthful conditions. In previous paragraphs we pointed out the asset represented by rural population. Putting all sentiment aside, we know that strong, healthy people are worth much more to the state than are people weakened by frequent or permanent sickness. A child makes no economic return to the state until the age of fourteen or fifteen. As the tables below will show, a large proportion of the children raised in cities die before this age thus causing a loss to the home and state for their rearing, to say nothing of the loss in sorrow and suffering. The purpose of this paragraph is to call attention to the fact that our state needs a strong healthy citizenship and that the rural districts are by far the most economical places to produce such citizens. We do not have complete figures on this question, but the facts presented in the table which follows are enough to prove the great wealth of healthful conditions in the rural areas.

Death Rates of Children in Rural Parts and Cities. (Based on 100,000 Children).

DISEASE.	CITIES		RURAL PARTS.	
	Under 1	Under 5	Under 1	Under 5
	(1)	(2)	(3)	(4)
Measles.....	206.3	151.2	119.3	63.4
Scarlet Fever.....	35.1	80.6	20.9	40.0
Diphtheria & Croup.....	180.9	343.8	99.0	124.6
Diarrheal Diseases.....	4,595.9	1,218.0	2,576.6	713.7
Total Death Rate of Children.....	18,410.	5,970.	11,740	3,440

The comparison between the rural parts and cities can be made by comparing columns (1) with (3), and (2) with (4). For example, it will be seen that 80 of 100,000 city children under five years of age die of Scarlet Fever, while only 40, or half as many, rural children of the same age die of the same disease. Thus it is easily shown that the state can afford to spend large sums to encourage a large percentage of our population to grow up on the farms where the chance for reaching maturity is almost 2 to 1, as against a like chance in the city.

It is probably futile for us to try to induce those who have moved to the city to return to the land, and it isn't reasonable to expect all of those born in the country to remain in their early environments, but the state should do its utmost to make as many of our citizens as possible, prosperous and contented in the rural districts where healthful exercise, wholesome employment, fresh food, pure water and pure air are plentiful, and where high grade citizens grow at least cost.

Assets in Rural Social Conditions.

If we consider money returns alone, we cannot show unusual reasons for encouraging rural life. We must put many other things to the credit of rural life in order to get a fair estimate of its advantages. We have already mentioned advantages in healthful conditions. While we need not here enumerate many particulars, we should in summing up the worth of our rural section, mention the things which make for valuable society in the farming districts. Here the simple unaffected life keeps the child in the growing stage of the body, mind and character for a long period of years. This affords a longer period for receiving impressions, and accounts for the teachableness of young men and women in the rural districts, and the steadiness of purpose which they manifest by the time they "get set." In the cities little children are pushed into complex society at an age entirely too young, and become "smart" and unteachable. Their childhood is "pulled green" without an opportunity to develop and ripen naturally into manhood and womanhood.

The moral atmosphere in the rural districts is undoubtedly superior to that of the towns and cities. The lack of distracting influences causes rural life to center in the homes, thus making parental care a strong force in forming character. While the rural church has not done its full duty, it has stood for simple sturdy morality that has set a high standard for those who attend it. There, living is in the open and religion is a real, personal matter. The rural boy and girl do not come under the undesirable influence of the gambling den, the pleasure hall, and the saloon. They are far removed from those things which spoil and weaken the life of so many young people in the cities, and are constantly under the influence of honest labor, wholesome play, abundant nature, and sacred home. To add concreteness to this argument, we quote a paragraph from a letter from the Warden of the West Virginia State Penitentiary.

"From general observation and personal contact with the prisoners sent here from West Virginia, I can safely say that a large majority of our inmates were raised in the country, drifted into the village and town, became addicted to the liquor or other drug habit, then got into trouble and were sent to the penitentiary. I should think that it would be the history of two-thirds of all the prisoners in the penitentiary."

Surely then from the standpoint of morals, we should use every means to keep the boys and girls of West Virginia from drifting from the farm to the town or city. For the purpose of showing our duty toward the rural problems, we have tried to point out briefly our assets as follows:

- (a) \$400,000,000.00 of value in rural real estate.

- (b) \$50,000,000.00 of annual production from our farms which is perpetual and subject to great increase.
- (c) Our asset in 860,479 people who live in purely rural sections. These constitute more than 70 per cent of our entire population.
- (d) The great value of conditions for health in rural life.
- (e) The superiority of social conditions in the country—home, morals, etc.

Considerations like the above have caused the State Board of Regents to seek every means of turning the work of the state educational institutions more and more to the service of this class of our people. We set forth these facts here hoping that they may explain in part, at least, our reason for asking liberal appropriations later on in this report.

ACTUAL AGRICULTURAL CONDITIONS IN WEST VIRGINIA.

Alarming View.

We are accustomed to allow our state pride to express itself in glowing terms about our great state, its wonderful resources and increasing products. This optimistic attitude is good as a general proposition, but it is highly essential that we occasionally take a calm scrutinizing view of the darker aspects of conditions in the state in order that we may be the more determined to find ways and means of making our state all that it is capable of being. It is of no use to dodge facts. It is the business of good citizens and legislators to deal with facts as they are and try to make the future facts better. The agricultural tendencies in West Virginia are quite similar to those in other states, and it remains to be seen whether our state is willing to join the other states in checking their waste and make the increase of production from the soil commensurate with the increase in population.

The first cause for alarm about our agricultural conditions is found in the fact that the rural population is drifting toward the towns and cities. We hear much in a vague way about the drift toward the towns and cities but we are likely to associate this movement with some far-away state or the country as a whole. This movement is going on at an alarming rate here in West Virginia. In spite of the fact that the population of our state as a whole increased 27.4 per cent during the last decade, the population actually decreased in a large number of our farming counties as shown in the following tables:

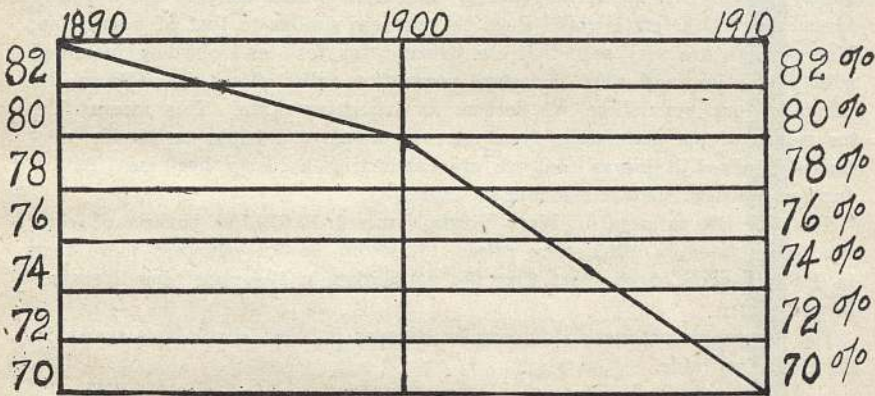
County.	Decrease in Population. Per cent.
Doddridge	7.4
Gilmer	3.3
Hampshire9
Jackson	8.8
Jefferson3
Mason	4.7
Monroe6
Pleasants	13.6
Ritchie	5.4

Tyler	11.2
Wirt	12.0

In a few instances the decrease indicated in the foregoing table may be explained by reference to peculiar industrial movements, but the same census bulletin from which the figures above were taken shows that the purely rural population decreased in Berkeley, Jefferson, Hampshire, Monongalia, Doddridge, Gilmer, Ritchie, Tyler, Pleasants, Wood, Jackson, Mason, Cabell and Monroe.

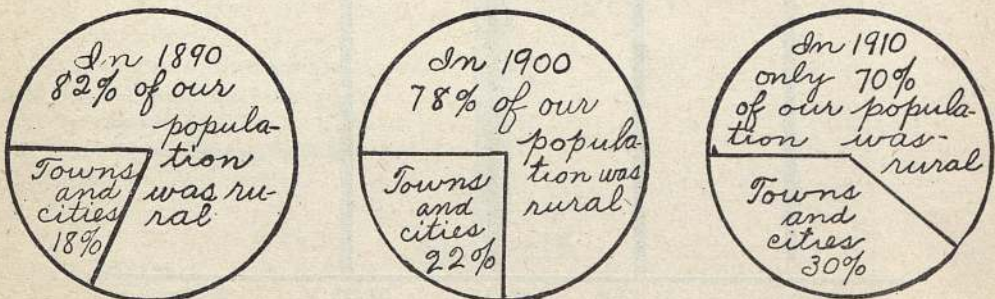
It is time for our lawmakers to take notice when the population in fine farming counties like Jefferson and Jackson falls off from 2 per cent to 8 per cent in a decade while it increases more than 50 per cent in industrial counties like Ohio and Logan. For the busy man who does not have time to read census reports or study long tables, the following diagram will tell the story.

Table Showing Movement of the People of West Virginia from the Farms to the Towns and Cities.



A glance at the above drawing shows how the rural population is dropping. The diagonal line running from the upper left hand corner to the lower right hand corner indicates the tendency. In 1890 82 per cent of the people in West Virginia lived outside of incorporated towns and cities; in 1910 it went down to 70 per cent; and by this time is even lower.

Table Showing the Decrease in Rural Population and the Increase in Urban Population in West Virginia Since 1890.



These circles show in another way how the percentage of rural population in West Virginia is shrinking and how the town and city population is ever increasing.

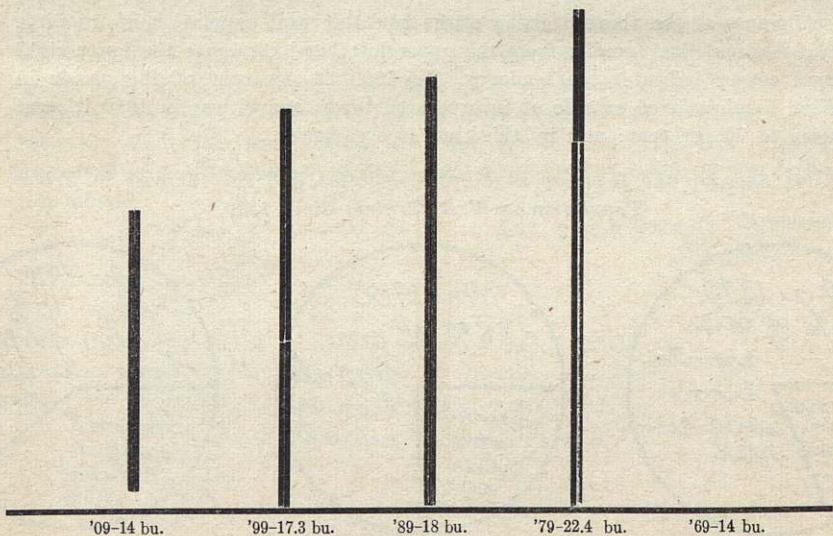
In the previous article it was pointed out why rural population is worth more than urban population, and how much better it is for the state to rear a large percentage of its people under the peculiar advantages which the country affords. Remembering these things, the above figures and diagrams represent grave social and economic problems. If we are equal to the demands of the hour, we will make an honest effort to check this disastrous movement in our population.

The Second Cause for Alarm is Found in the Fact that Increase in Production is Falling Below Increase in Population in West Virginia.

As stated in preceding paragraphs, the population of West Virginia increased 27 per cent during the last decade. Increase in population means increase in ability to produce, hence the natural conclusion would be that the ordinary farm crops of the state would show the increase similar to that of population. Moreover we are very sure that the demand for food and clothing increased with population, and when our state production falls behind the ordinary demands of our population, we become an importing state. This means that the money of our state flows from our own stores and banks to outside merchants. Indeed it means that we are conducting a losing business. Before further comment the facts should be examined.

In 1899 the farmers of West Virginia raised 16,510,730 bushels of corn. Ten years later in 1909, they raised 17,119,097 or 3.1 per cent more than in 1899 in spite of the fact that the population in the same time increased 27 per cent.

The per capita production of corn by decades in West Virginia is shown in the following table.



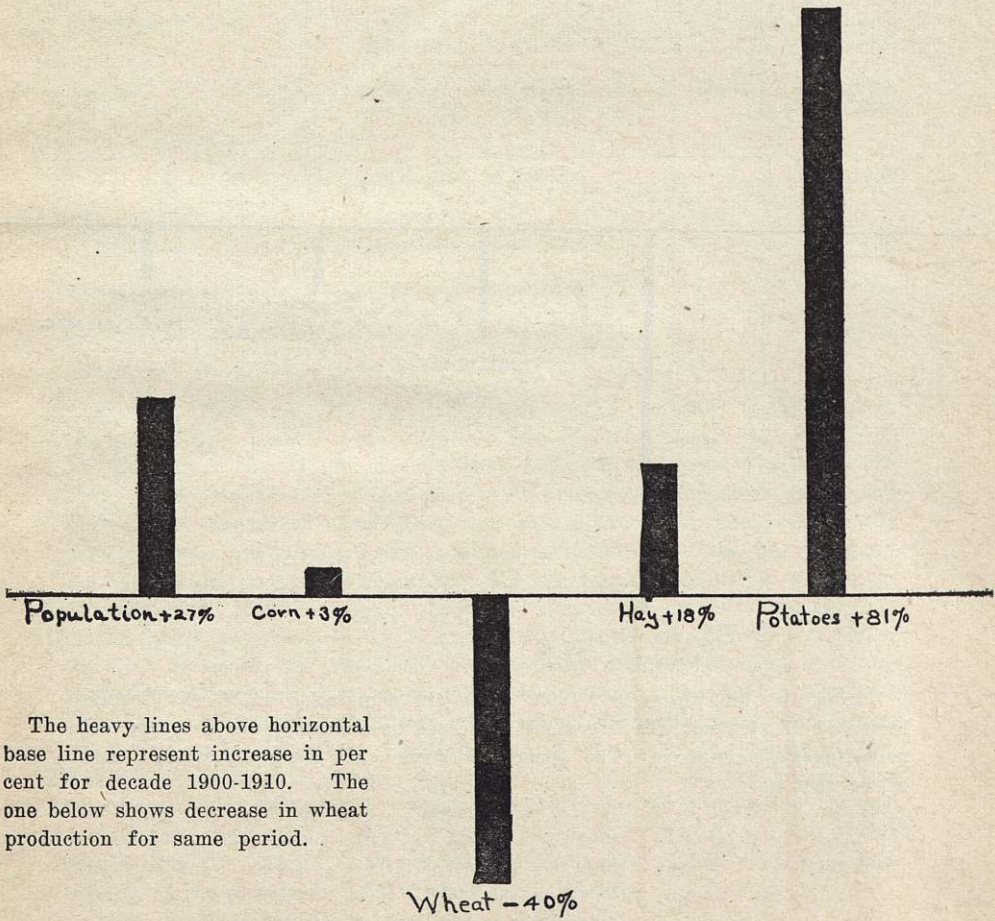
While corn is not used in such large quantities for human food, we can produce much more on the land already in that crop as will be pointed out later.

There has been a decrease in numbers of live stock during the period under discussion that is worthy of our consideration. The situation is well shown by the following table.

Domestic Animals on Farms in West Virginia.

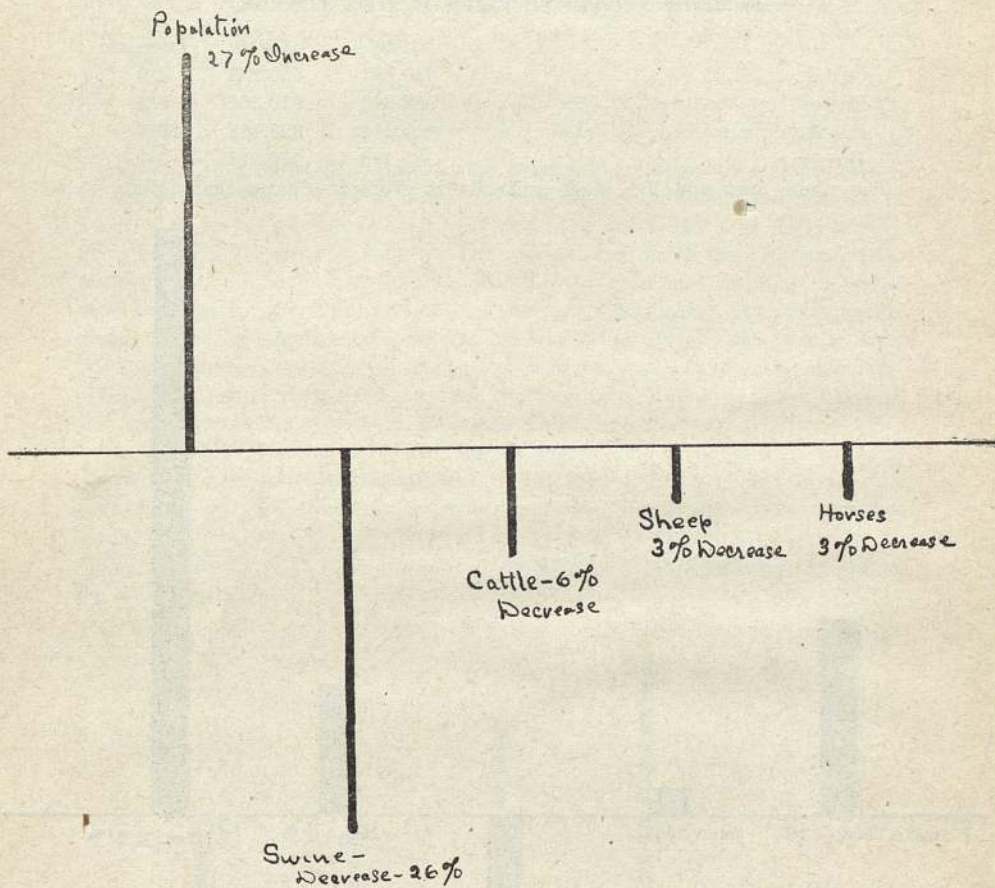
	1900	1910	Decrease
Cattle	639,782	620,288	3%
Sheep	968,843	910,360	6%
Swine	422,844	328,188	26%
Horses	185,188	179,921	3%

The whole crop and live stock situation is given in Charts that follow.



The heavy lines above horizontal base line represent increase in per cent for decade 1900-1910. The one below shows decrease in wheat production for same period.

Diagram Showing Increase in Population and Decrease in the Number of Live Stock Produced in West Virginia Since 1899.



During the ten years 1899-1909, while the population in West Virginia increased 27 per cent, the live stock decreased as shown by the diagram and percentages given above. The demand increased, the supply decreased, and prices went up.

WEST VIRGINIA CROPS AND IMPORTS.

CROP.	Imported Amount and Value	Produced Amount and Value	Yield per Acre	Possible Increase per Acre	Possible increase Amount and Value
Hay.....	157,422 Tons \$ 2,761,645.00	639,104 Tons \$ 7,492,747.00	.9 Tons	4 Tons	283,560 Tons \$ 3,323,323.00
Corn.....	3,703,091 Bu. \$ 3,341,809.00	17,119,097 Bu. \$ 11,907,261.00	23.3 Bu.	5.0 Bu.	3,381,555 Bu. \$ 2,367,088.00
Oats.....	2,974,727 Bu. \$ 1,706,440.00	1,723,806 Bu. \$ 912,388.00	16.6 Bu.	8.4 Bu.	864,403 Bu. \$ 456,194.00
Dried Beans.....	357,670 Bu. \$ 906,851.00	39,794 Bu. \$ 81,049.00	4.6 Bu.	4.6 Bu.	39,794 Bu. \$ 81,049.00
Potatoes.....	1,882,880 Bu. \$ 1,151,709.00	4,077,066 Bu. \$ 2,278,638.00	96.0 Bu.	24.0 Bu.	1,019,241 Bu. \$ 569,659.00
Total of above crops.....	\$ 9,868,454.00	\$ 22,672,638.00			\$ 6,797,313.00
Total Exclusive of Animal products.....	About \$ 34,000,000.00	About \$ 35,000,000.00			About \$ 10,000,000.00
Animal Products and Sales.....	\$ 16,000,000.00	\$ 25,000,000.00			\$ 5,000,000.00
Total.....	\$ 50,000,000.00	\$ 60,000,000.00			\$ 15,000,000.00

In 1908, 1909 and 1910 the Experiment Station collected statistics from the wholesale grocers and jobbers in all the cities and towns of the state as to the amount of food-stuffs imported into West Virginia. The data was necessarily incomplete; no returns were secured on fresh meats, and only partial returns on cured meats and animal products. The data for the first two years was tabulated and published in the report of the West Virginia Agricultural Experiment Station for 1909-10 (pages 9-15). The writer has personally examined the original reports and summaries, and feels that the published figures are decidedly conservative. The reports for the year October 1, 1908, to September 30, 1909, show total imports exclusive of meats and animal products amounting to about \$34,000,000. The animals and animal products annually imported doubtless amount to \$16,000,000, though no figures of any value are available. Thus the annual imports of food-stuffs are undoubtedly worth \$50,000,000, or nearly as much as our total agricultural production of about \$60,000,000. West Virginia prides itself on being the second state in coal production; but when we consider that though we receive \$44,000,000 for coal, we spend \$50,000,000 for imported food, we see the possibility of the proverbial "fall" which pride precedes.

These figures bring out several very striking points.

1. The state imports nearly as much food-stuffs as it produces.

2. At least 65% of the food-stuffs consumed by towns and cities is imported.

3. Not over one-third of the products of our farms are sold, at least two-thirds being consumed on the farm.

The last two statements may be readily deduced from a consideration of production in relation to importation. The U. S. Department of Agriculture reports that for the last ten years an average of but 6 per cent of our corn was shipped out of the country where produced, 15 per cent of the wheat, and 4 per cent of the oats. This means that these crops are practically consumed on the farms. Of the \$22,672,083 produced by the five crops named, probably not over \$5,000,000 is sold from the farms, as against nearly \$10,000,000 worth of the same crops imported from outside the state. Of the total farm products of the state, probably not over one-third are sold off the farm, or about \$20,000,000 as compared with \$50,000,000 paid for imported food.

4. About one-third of the amount of food-stuffs now imported might be raised on our farms without increasing the acreage, and with an increased profit per acre, by the use of better methods so as to give a larger yield per acre.

In short, with an increased profit per acre, we might increase the production of the land now in use by at least \$15,000,000 per year; this could be done indefinitely; and the system of farming which would produce such crops would tend to improve the land much more than at present."

Agricultural Possibilities.

Increased production in this state may take two forms.

1. The staple crops such as corn and hay may be made to yield more on present acreage as the following statement by Dean Sanderson will show.

"Corn is our leading crop, and produces about one-third of our crop values. The average yield was 25.3 bushels per acre in 1909, which was a good year. According to reports of 164 West Virginia farmers to the U. S. Department of Agriculture, it cost them \$16.21 an acre to raise corn, their yield averaging 34.7 bushels. This would leave them a profit of \$4.61 per acre with corn at 60 cents. It costs practically as much to raise 25 bu. but the smaller crop pays only wages for labor and interest on the land, but no profit. Most of you would call a nine-ounce ear of corn a "nubbin" as it is only 6 $\frac{3}{4}$ inches long; but if we would get but one such "nubbin" on but one stalk in a hill, with hills 3 $\frac{1}{2}$ x 3 $\frac{1}{2}$ feet, we would secure the average yield per acre for the state. Any farmer would resent it if you insinuated that he could not get two such ears per hill, but two per hill would yield 47 bushels per acre.

The fact is that most of our farmers are planting seed that will not germinate, and so secure but half a stand. The cost of production of 25 or 47 bushels per acre is practically the same, but the former or average yield means no profit, while the latter means \$11 profit; at least \$5 per acre may be realized from the simple process of testing the seed corn. In Randolph county, whose average yield is 34 bushels per acre, two men last year produced over 100 bushels per acre. There is not a piece of land in the state fit for

corn that will not produce 40 bushels per acre more profitably than 25, if rightly handled.

Furthermore, when we study the statistics as regards maintenance of fertility, it is evident that the soil is being mined and not farmed, for there is no return to it of the plant food removed. It is evident that our farmers have not come to appreciate the profitableness of commercial fertilizers. Neither are they maintaining fertility by barnyard manure, for the live stock kept are entirely inadequate to return more than a fraction of the fertility to the land, and fully half the manure is wasted.

There can be no question, therefore, that, through use of better seed, deeper plowing, fertilization and cultivation, the yield of corn can be very greatly increased with corresponding profit.

The same is true of our hay crop. According to the U. S. Department of Agriculture, the average yield for West Virginia from 1896 to 1905 was 1.3 tons per acre, and from 1906 to 1908 it was 1.44 tons per acre. In 1909-10 it dropped to 1.25 tons, but according to the thirteenth census was only .9 tons per acre. Obviously it is entirely possible to increase the yield to 1.3 tons per acre.

On the Experiment Station farm at Morgantown, land which when bought produced not over half a ton per acre, now produces three tons per acre at a good profit."

2. Intensive crops requiring small areas as fruit, truck, potatoes and tobacco, can be grown on some of the ground at present used for other crops giving a smaller income per acre.

The table given below will show the advantage in using some of these crops where land is limited.

Value per Acre of Some Farm Crops in 1909.

Wheat	\$ 12.90
Hay	10.60
Corn	17.70
Potatoes	53.50
Tobacco	107.20

Market gardening and fruit growing will show much larger returns in many cases and the increasing city population of the state ought to be supplied with fruits and vegetables from our own borders.

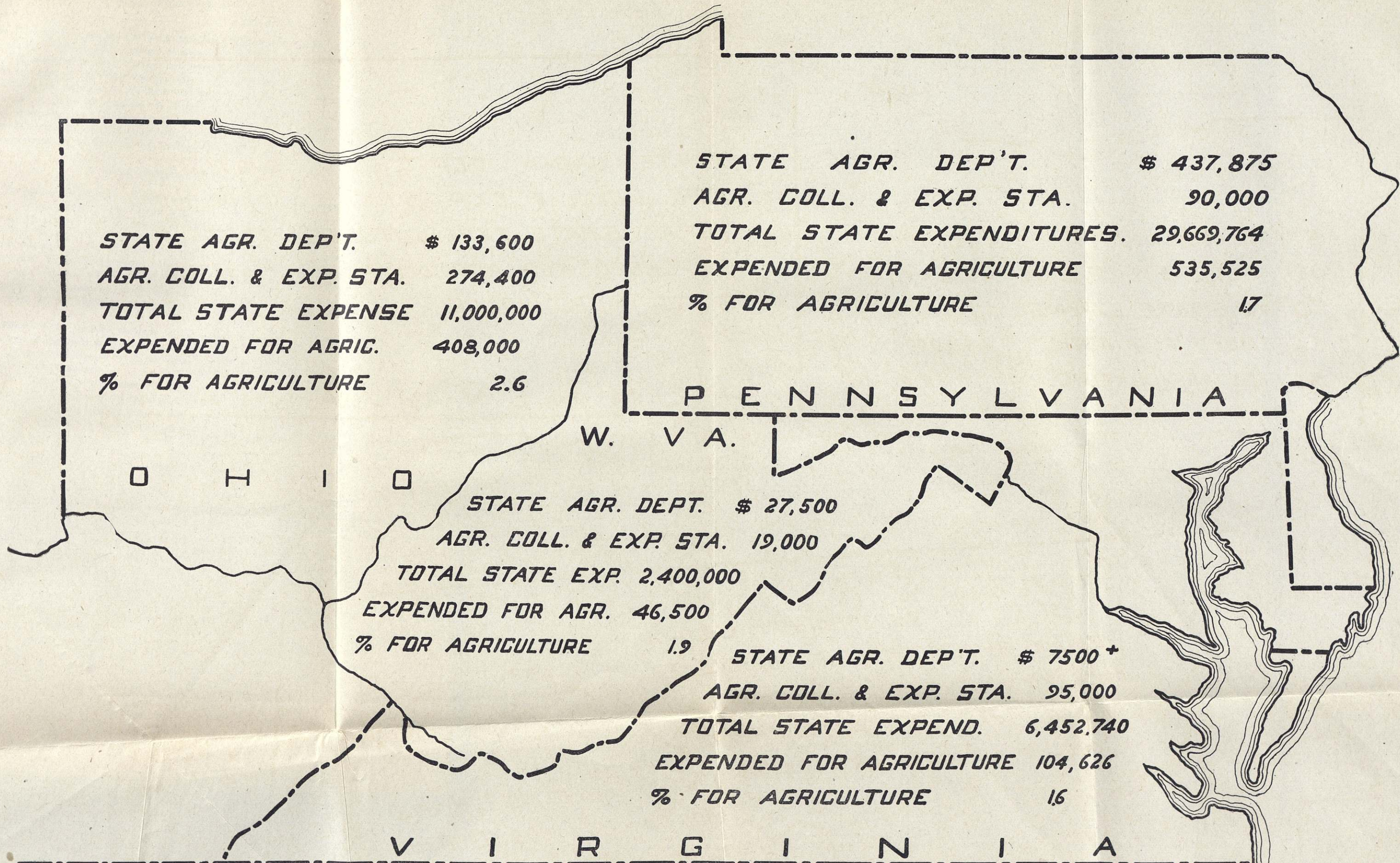
Live stock and dairy farming may be increased by utilization of silos and the growing of more forage. Without using modern methods in these industries we may have still further decrease.

AGENCIES FOR PROMOTING AGRICULTURE AND RURAL EDUCATION.

In any effort to increase agricultural production or to better country life, we must reach two classes of citizens—the adult farmers and their wives, and the children and youth who will soon take their places. The state is thoroughly committed to the education of the youth, but we are just coming to appreciate that our system of education has lured the boys and girls from the farm, and has given them no training for doing their share of the world's work. It is obvious that the whole school system of our rural districts must be revamped to this end—to enthuse boys and girls with interest in country life and to give them such a training in the school that they will become better farmers and home makers than their parents. This means a new sort of elementary country school and country high schools devoted to agriculture and home economics or with strong courses in these subjects. It means that the high schools and normal schools must prepare teachers who not only have the necessary technical training, but who have a warm enthusiasm for all that is best in country life. This involves the proper equipment of our high schools and normal schools for such work, and their employment of thoroughly trained instructors. In its turn, the State University must prepare teachers for the normal schools and high schools. Thus, the whole educational system of the state from top to bottom is involved in the problem of a better schooling for the country boy and girl, for "no stream can flow higher than its source."

Such changes in our educational system cannot, however, develop any faster than the interest of the general public or than taxpayers are able to support them. The new type of country school cannot be successfully developed any faster than its constituency feels its need and has the means to meet the cost. It is obvious, therefore, that the adult farmer must be shown how he may secure a greater financial return from his land and be convinced that there are new methods which are profitable. He must be brought to see that there are possibilities in country life before he will be interested in any type of education designed to fit his boy or girl for the farm. Furthermore, we have now come to appreciate that if it is wise for the state to educate its youth it is equally good policy to encourage the education of both young and older men and women who from necessity have been compelled to leave school at an early age. Is there any reason why it is not as important for the state to aid in the education of a man or woman on the farm as in that of the more fortunate individual who has the means to pursue a higher education at some institution of learning?

When the farmer commences to secure better returns for his labor, and to appreciate that there is as much or more to be learned concerning the methods of successful agriculture as in any other business or profession, then he will be alive to the need of better school facilities for his children, and will be able to support them. Such advancement is often started through the obvious results of agricultural work carried on by the schools, particularly through the boys' and girls' agricultural clubs. Thus, any effort to rear a better coming generation for country life must be accompanied by work which will give the present generation better conditions and a new point of view. Any general scheme of agricultural education must, therefore, fully recognize the impor-



STATE AGR. DEP'T. \$ 133,600
 AGR. COLL. & EXP. STA. 274,400
 TOTAL STATE EXPENSE 11,000,000
 EXPENDED FOR AGRIC. 408,000
 % FOR AGRICULTURE 2.6

STATE AGR. DEP'T. \$ 437,875
 AGR. COLL. & EXP. STA. 90,000
 TOTAL STATE EXPENDITURES. 29,669,764
 EXPENDED FOR AGRICULTURE 535,525
 % FOR AGRICULTURE 1.7

P E N N S Y L V A N I A

W. V A.

O H I O

STATE AGR. DEPT. \$ 27,500
 AGR. COLL. & EXP. STA. 19,000
 TOTAL STATE EXP. 2,400,000
 EXPENDED FOR AGR. 46,500
 % FOR AGRICULTURE 1.9

STATE AGR. DEP'T. \$ 7500 +
 AGR. COLL. & EXP. STA. 95,000
 TOTAL STATE EXPEND. 6,452,740
 EXPENDED FOR AGRICULTURE 104,626
 % FOR AGRICULTURE 1.6

V I R G I N I A

This map shows what West Virginia and her neighbors are spending on different branches of scientific agricultural work. The 1913 session of our legislature should make such a comparison more creditable to West Virginia.

tance of a suitable program of work for both children and adults, and that any efforts to permanently improve country life must reach both the children and their parents, for their interests are bound up together.

The problem of improving country life is so broad, therefore, that all the agencies at the command of the state will have the widest opportunity for doing their utmost in its solution. It is our purpose to outline what the different institutions of the state are doing to this end, to indicate what they should be encouraged to do, and to point out what is the work of each in a general movement for better rural life in West Virginia.

West Virginia University.

In the history of education and of our advancement as a race, new methods and intellectual advance have always originated in the higher institutions of learning and gradually spread downward through the whole educational system and to the whole people. This must necessarily be so, as the teachers of the lower schools must receive their training and intellectual stimulus in schools of higher grade, if any advancement is to be made. Thus, in a movement for better rural education we look to the state university as our source of knowledge and for the preparation of our better teachers.

The work of the university for rural education falls under three distinct heads:

1. Education of resident students in agriculture and home economics by the College of Agriculture and the Department of Home Economics.
2. Agricultural extension work throughout the state, through the Division of Agricultural Extension.
3. Investigation and experiment to discover new methods of more profitable production as carried on by the Agricultural Experiment Station.

The College of Agriculture gives a four-year course leading to the degree of Bachelor of Science in Agriculture, open to students who are graduates of high schools. This course gives a good foundation training in the general sciences, and devotes about one-half of the time to strictly agricultural subjects, with opportunity to specialize along some particular branch of agriculture in the last two years.

West Virginia University was founded as the West Virginia College of Agriculture and Mechanic Arts, upon the land grant made by Congress known as the Morrill Act. For many years, though the state received congressional appropriations for that purpose, practically no agriculture was taught. A separate chair of agriculture was established in 1892, and since then a separate course in agriculture has been recognized. Not, however, until the present Board of Regents assumed charge of the university was any attempt made to give any adequate support to agricultural instruction.

In 1910 the whole material equipment of the College of Agriculture was not worth over \$500, and it was probably the poorest equipped of any similar institution in the country. Practically no students had entered the course, and it was therefore claimed that there was no real demand for agricultural education and that as soon as the demand was apparent better facilities would be provided. Obviously, however, few students would enter an institution with no equipment for their instruction; so that this reasoning was utterly

fallacious. In 1910 but 13 students were enrolled in the college course, from which but seven had graduated since 1892. Of these graduates three are farmers, three are in agricultural college, experiment station or extension work, and one is in business. Eight students had graduated from a two-year college course (Bachelor of Agriculture) since discontinued. Three of these are farmers, two are in agricultural work, one is a veterinarian, and two are in business.

During the fall semester of 1912, thirty-seven students are registered in the four-year course in agriculture, and five students were graduated last summer. It is interesting to note that one of these graduates is teaching agriculture in the Fairmont Normal School, two are teaching agriculture in high schools, one has charge of the boys' and girls' agricultural clubs, and another is employed in forest pathology by the U. S. Department of Agriculture. This shows a healthy growth in numbers during the past two years, and has been due to the better support given the college by the present Board of Regents. Everything possible has been done to properly equip the college for thorough instruction, and a very marked improvement has been effected; but, with the very limited amount of room available, with no farm facilities until very recently, and with no special appropriation for the work of the college or material increase in the total appropriation for the university, it has not been possible to give the college the equipment necessary for giving a thorough training in practical agriculture.

The agricultural faculty has been greatly strengthened in the last two years. In 1910 there were four departments of instruction, with one man devoting his entire time to each. At the present time there are eight departments of agricultural instruction, with a faculty of twelve members. Most of these instructors, however, devote from one-fourth to three-fourths of their time to experiment station or extension work. This enlargement of the staff has been effected by organizing all work of both college and experiment station under one head in each department, and, though the quality and amount of instruction has been greatly improved, the cost is but little more than formerly.

It may not be out of place in this connection to briefly consider the purposes and objects of the collegiate course in agriculture. The opinion prevailing seems to be that the graduates of agricultural colleges should be trained for farming, that nearly all of these graduates should immediately engage in practical farming, and that the colleges fail of their purpose if such is not the case. In recent years the percentage of graduates returning to the farm has increased rapidly. This has been particularly true of our larger institutions in the agricultural states, and especially where the colleges of agriculture are at the state university. Statistics show that a much larger proportion of the graduates from colleges of agriculture at state universities become farmers than do those from separate agricultural colleges, for at the latter institutions many of the students take an agricultural course merely to secure a scientific college education, with no intention of farming.

A more careful consideration of the future of our agricultural colleges should convince any one that their greatest usefulness will be in preparing agricultural leaders, and that it is unreasonable to expect that the great majority of their graduates will immediately return to practical farming. It is well known that only 1 or 2 per cent. of the school population are able to secure a college education. The larger number of college graduates enter some profession.

Practical farming is not a profession, but a trade. Is it any more reasonable to expect that any large number of men should take a university education to train them for farming, than that they should do so to train themselves as grocers, bakers, or blacksmiths? The fact is that the great mass of our population engaged in industrial pursuits do well to secure a high school education, and if they are to receive instruction in the science and art of their trade it must be in the secondary school. This is now generally recognized, and rapid advancement is being made in introducing industrial subjects in our high schools. The demand for agricultural teachers for these schools, for teachers in agricultural colleges, and for investigators in the experiment stations and U. S. Department of Agriculture, for county agricultural experts, for farm managers, for men in agricultural manufactures and business, at present far exceeds the supply of agricultural college graduates qualified for such positions, even at high salaries; and this will be even more so for the next decade.

The difficulty in filling many of these positions is due to the fact that well trained men can often secure better incomes and more independent life on the farm and prefer it to salaried positions. This being the case, the agricultural colleges will do well if they can meet the demand for men trained for leadership in agriculture, and in this work will be their greatest usefulness to the people. For training the large mass of our farmers we must look to the high schools, the short courses of our agricultural colleges, and to the work of our extension service.

School of Agriculture. Inasmuch as no other institution in the state has, until very recently, offered any adequate instruction in agriculture, there has always been a demand for an agricultural course at the university open to students who could not meet the entrance requirements for the college, and for short courses open to mature farmers for a few months during the winter. To meet this need, in the fall of 1911 the regents established the School of Agriculture and Home Economics. The course covers four years, there being but two terms extending from September to late March. This permits boys from the farm to return home for spring work and earn sufficient during vacation to pay their school expenses. This school is not established to compete with the high schools, or to serve as a preparatory course for the College of Agriculture, but to give young men who are unable to secure both a high school and college education the best possible preparation for a successful country life. Gradually our high schools, which serve rural communities, will introduce courses in agriculture, and with their general development the reason for a School of Agriculture at the State University will have passed, as is the case with the preparatory school, which has been abolished on account of the rapid organization of high schools throughout the state. Meanwhile the College of Agriculture has a faculty and equipment which will enable it to give instruction in agriculture to meet the needs of large numbers of young men and women, most of whom would not enter high school.

In 1911-12, nineteen male students were enrolled in this school, of which five were enrolled only for the short course during the winter term.

One of the most valuable courses in the School of Agriculture is the farmers' course, which is planned to meet the needs of mature farmers who can spend but a fortnight at the school in mid-winter. An average of fifty men have attended this course each winter for the last two years.

Needs of the College of Agriculture. The development of the collège during the past two years, and the rapid growth of other agricultural colleges which have been furnished adequate facilities for instruction, as shown in table No. 1, indicate that, with proper facilities for instruction, it would soon become one of the largest colleges of the University, and would be able to render the state a large service in the preparation of teachers, agricultural demonstrators, and practical farmers who would become leaders in their home communities.

Farm. Agriculture, in its various phases, cannot be taught successfully in the class room and laboratory alone. The instructor and student must have access to a well equipped farm, where the work taught may be seen in actual operation and where methods, equipment, live stock, etc., may be compared and studied. No agricultural college ever has or ever will succeed without such equipment. The chief criticism of this institution by the farmers of West Virginia has been the lack of such farm equipment for practical instruction. This is so self-evident that it needs no further argument. As evidence of this, we need only cite the report of the last legislative committee of the State Grange (Proceedings 40th Annual Session, p. 44):

“It is a fact that no college of agriculture or agricultural school has in the past nor can in the future ever amount to anything like its proper usefulness, without having in connection therewith a farm of sufficient size and character, where demonstrations can be made along the various lines of agricultural education, and where students, especially those in the lower grades, can actually perform the necessary operations of farming, market gardening, horticulture, and kindred pursuits.”

The farm formerly operated by the Experiment Station has now been transferred to the management of the College of Agriculture, and, though still available for experimental work, it will be developed with a view to its use for purposes of instruction.

The present farm is, however, entirely inadequate both in area and equipment. Out of a total of some ninety-four acres, only about thirty acres are tillable. This area is hardly sufficient for experimental work alone. With the transfer of the farm to college management, sufficient land must be kept available for experiment station work, and all cost of such experimental work will be charged the station and credited to the farm. There should be at least 100 acres of tillable land, which would probably mean a total of about 200 acres. If it be feasible to buy land adjacent to the present farm, its location is as desirable as any which can be secured. If this be not possible, the present farm should be sold and another farm purchased.

Barns. The barn now on the farm was originally built for sheep, and is entirely unsuited to dairy cattle: in short, it is a disgrace to the institution. A new barn or barns should be built at once. Sheep growing is one of the leading agricultural industries of the state, and the institution has already been presented with sheep of two breeds by two of our leading sheep growers as a start in building up a flock. We have only temporary sheds for caring for them. A suitable sheep barn to accomodate one hundred head, with fencing, water, etc., should be built at once. The institution should have a few hogs of various breeds, for purposes of instruction and experiment, and movable houses and fencing for them should be provided. Much of the fence around the present farm is in bad shape, and additional land would require considerable new fence.

ing. With the purchase of more land and better buildings, it will be desirable to build a new dairy house in connection with the barn. The poultry houses should also be relocated, so that the poultry department will have a certain part of the farm for its exclusive use. An open feeding shed should be built for experimental work in steer feeding. The road to the farm is in very bad repair beyond the pavement, and if students are constantly to go to and from the farm a plain plank walk should be built and the co-operation of the city secured in repairing the road.

If a farm is to be maintained for purposes of instruction, living quarters must be provided for a number of students. Students taking courses in stock feeding and management, poultry, vegetable gardening, etc., should be required to do a certain amount of practical farm work in these subjects. With the amount of laboratory work required at the University during the afternoons, it is not feasible to arrange such work unless the students can stay at the farm over night. For this purpose, living quarters should be provided for at least twenty students, who could stay at the farm dormitory for a month at a time and then be replaced by another squad of students for a similiar period of practice work. Furthermore, we have numerous students who desire to secure work on the farm to assist them in paying their college expenses. A considerable amount of farm work could be done by such students, were living quarters available. Therefore, we would urge the necessity of a dormitory with a capacity for twenty-five men, and matron or family, dining room, etc., to be located on the farm. The lack of such dormitory equipment and required labor on the farm have prevented the proper training of students at many of our agricultural colleges, and it will never be possible to give real training without such equipment.

Agricultural buildings. At the present time practically all the instruction in the College of Agriculture is given in the rooms on the first floor and in the basement of Martin Hall, the oldest building on the campus. Some of these rooms are already too small for the classes, and it is necessary to use the same class room for different subjects requiring different equipment for lecture and laboratory work. It is impossible to properly develop the instruction work in the limited room now available. Twenty men are working in the small building occupied mainly by the experiment station. The experiment station laboratories are so badly crowded as to seriously interfere with the station work. The Department of Home Economics has but two rooms in the basement of Woodburn Hall, and needs a kitchen, dining room, and recitation room. The Botanical Department, whose work is intimately related to agriculture, is housed in a delapidated frame building with insufficient room for the large classes. There is the greatest need for a modern fireproof building to house all the work of the College of Agriculture, the Experiment Station and the Departments of Home Economics and Botany. Such a building should have ample floor space to accommodate the probable growth of the work for the next ten years. It has been the universal experience of other institutions that their growth has exceeded their most sanguine expectations, and almost without exception the buildings heretofore erected have soon proved entirely inadequate. Careful study of the needs of the various departments, floor space for which has been carefully itemized, indicates that a building with two floors and base-

ment, 200 feet long by 60 feet wide, and with two wings 50 by 60 feet, would be necessary.

In addition to this, a one-story building for machinery and stock-judging should be built at the rear, to connect with the two wings. Almost all the agricultural machinery desirable for study will be loaned by the manufacturers free of charge if it is properly housed. At the present time the college is unable to give satisfactory instruction in farm machinery, as it has no place for it.

For obvious reasons, the work of the veterinary department should be housed in a separate building, which should have an operating room and stalls for hospital purposes. This would enable the institution to conduct a free clinic, thus not only being of considerable service to the farmers in its section but giving its students the best opportunities for study.

The present greenhouses are nearly twenty years old, and, although they have been patched up, they are far from satisfactory, and it is unprofitable to repair them further. The institution should have at least four houses 25 by 100 feet, opening into a central house, part of which would be used as a propagating house and one end as a palm house.

With the demand that is now being made upon the College of Agriculture and the Experiment Station to take the lead in the agricultural development of the state, the state cannot afford to curtail their usefulness by a failure to provide adequate quarters, and it would be false economy to erect a cheap building or one which would merely meet the present needs of the institution.

Equipment. The erection of a building would involve the necessity of a reasonable appropriation for a suitable equipment of the rooms with shelves, cases, furniture, etc. The greatest need of the college, however, is for equipment of the farm with the best live stock of all kinds. A beginning has already been made by starting the reorganization of the dairy herd with a view to building up a strictly high grade herd, and some sheep and swine have been secured. It is not possible to handle more live stock without additional land. But as the live stock industry is the basis of most West Virginia agriculture, the state should see to it that their leading agricultural institution has none but the best of stock of all kinds adapted to their needs.

The Department of Home Economics is organized under the College of Arts and Sciences; but its work should be considered in this report, for as the College of Agriculture seeks to train young men for country life, so the Department of Home Economics furnishes training for young women of both town and country, which will make them better home makers. There is no question that a course of study in which home economics has the most prominent place will in the near future be the most popular course for all young women who are not preparing themselves for teaching some special subject.

This department was opened in the fall of 1910, in charge of an instructor, during which year twenty-two students were enrolled. At the present time the department is in charge of an assistant professor, with part time of an assistant, and twenty-nine students are enrolled in the first semester, as against fourteen last year.

The department offers a four-year course for the training of teachers of home economics, and the demand from the normal schools and high schools



TOWNSEND HALL.

One of the Agricultural Buildings at Ohio State University.



AGRICULTURAL BUILDING, PENNSYLVANIA STATE COLLEGE—Value \$150,000.00.

of the state is such that all of the graduates receive immediate employment.

Courses are also offered which may be elected by any students of the College of Arts and Sciences. There is a marked increased interest in the work of the department upon the part of women desiring a general education who have no intention of teaching. It has been the experience of other institutions that home economics, where proper facilities for instruction are furnished, is rapidly becoming the principal feature of education for women. There is need of a special arrangement whereby women students who desire to take but one or two years of college work may spend a large portion of their time in this department, as there are many young women who are able to take but one or two years of college work, and who desire to secure a sort of "home-makers" course during that time. Relatively few young women of West Virginia have heretofore been prepared for taking college work, and many are still unable to complete a four-year course. The work in this department should be so arranged as to meet the needs of this class of students.

Extension work. Up to the present time the work of this department has been practically confined to the instruction of college students, although a beginning has been made at extension work, as recited under Agricultural Extension, which has been so auspicious as to indicate the great need of extension work in home economics for the women of West Virginia. The opportunities for such work will be but briefly indicated, but the success which has attended such efforts at other institutions and the great demand for such work in West Virginia indicates very large possibilities for the usefulness of the department in extension work. In the development of home economics or domestic science work in our public school system, the department is constantly called upon to co-operate with superintendents in planning courses of study and designing equipment. The local extension schools in home economics serve very effectively to arouse interest in the work and lead to its introduction into the public schools. A large outlay for equipment is not necessary to do effective work in home economics in the rural schools. The chief need in this line is for additional help, so that this department may be able to lay out plans for the correlation of the work which the girls do at home in relation to the school work. There is also great opportunity for the instruction of the teachers of the state through correspondence courses, institute work, and otherwise, as to how they may exert their influence for better living conditions in their communities. The department should have sufficient help so that the members of its force might be intimately acquainted with the living conditions on the farm homes of West Virginia, in order that its extension work might be planned to meet their needs. There is already a large demand for home economics extension schools and institutes, which the department is unable to meet owing to the fact that there are no funds available for such work. The work of the department is of as much service for the development of better living conditions in our towns and cities as in the country, and there is great opportunity for aiding organizations of women in planning studies of home conditions and systematic studies of home economics, and in arousing interest in this subject among the women's organizations of the state. Already a very marked interest is being manifested by the women's organizations of the state in the need of instruction in home economics in our public school system. They look to this department as the natural leader in such a move-

ment but at the present time it is practically impossible to do much of this sort of work, owing to the fact that the entire time of the head of the department is occupied with class room work.

The department needs additional rooms, particularly a dining room, kitchen, recitation room, and office, and should also be provided with a dwelling house, either to be maintained by women students on a co-operative plan or in which students can live for a short time and be given practical instruction in the management of household affairs. The theoretical instruction of the class room can no more give satisfactory training in home economics than can the work of the class room without the use of farm, gardens and live stock in agriculture. Most of our leading institutions are now providing such houses or apartments in which to give practical training. This need is further emphasized from the fact that two of last year's graduates are now engaged in work for which they had no such training at this institution and which training would have been invaluable to them in their present positions.

The improvement of our country life and the retention of its best young men and women in farm homes is as much a problem of better conditions for the women of the farm as it is of how to increase production and render the farm more profitable. The two phases of the problem are inseparable. A material advance in meeting the one will not be made without a similar change in the other. Farm life for women must be made easier and more attractive, or they will continue to seek the easier life of the town and city. In all investigations of the reasons for the exodus from the farm it has been found that one of the principal causes is the desire of farmers' wives for easier living conditions for themselves and their daughters in town or city. It is useless to preach to country boys and girls of the beauties and joys of country life when they know that their own mothers have prematurely worn themselves out in unnecessary toil and drudgery arising from lack of conveniences and understanding of the best methods of home management; and, with the country women encouraging their children to go to the town and city, it is practically impossible to arouse their interest in life on the farm.

2. The West Virginia Agricultural Experiment Station is a distinct and separate department of the University. It was established by the Board of Regents in 1887, by authority of an act of Congress, known as the Hatch Act, which was passed on the 2nd day of March of that year. Further support was given by an act of Congress, known as the Adams Act, approved June 30, 1908. The funds for carrying on the operation of the station, with the exception of its earnings, are derived wholly from the national government. The aforesaid act in section two fully states the object and purposes of the Experiment Station as follows:

“That it shall be the object and duty of said experiment station to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with the remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and water; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaption and value of grasses and forage plants;

the composition and digestibility of the different kinds of foods for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches and experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable, having due regard to the varying conditions and needs of the respective states and territories.''

In addition to the work above outlined, the station has been charged by the state legislature with the enforcement of the law for the control of commercial fertilizers, chapter 62 B of the Code of West Virginia.

During recent years the director of the station has been charged with the enforcement of chapter 33, acts 1901 (amended by chapter 49, acts 1903), for the inspection of nurseries and orchards for injurious insects and plant diseases, and with the expenditure of a special fund for the promotion of horticulture and trucking.

The work of the station may be appreciated from a brief account of the investigations being carried on by the various departments, as follows:

Department of Agronomy.—The agronomist is conducting variety tests of soy-beans, oats, wheat, grasses, clovers, field beans and corn on the station farm, to determine which are best adapted to this section, and this work will be extended to other parts of the state; the soil fertility plot experiments are being continued, and these have already given valuable results in showing the fertilizer requirements of one type of West Virginia soil; improved and higher producing strains of corn are being developed by selection and breeding; a study of the adaptability of alfalfa to various soils of the state is being made and best methods of seeding are being studied by observation and experiment; studies and experiments in pasture renovation, a matter of vital importance to many parts of the state, are being planned.

Department of Chemistry.—The chemist is also chemist of the State Geological Survey, to which work the entire time of one assistant employed by the survey is devoted. One assistant devotes his entire time to the collection and analysis of the commercial fertilizers sold in the state. The chemist and two other assistants devote most of their time to research work under the Adams fund. The investigation of the effect of pressure on bacteria has shown that most bacteria may be killed by high pressures. This investigation has been in progress for several years; and it is believed the results, which will be published shortly, will have an important bearing on many other problems. An investigation of the relation of oxidation, as promoted by various agricultural practices, to the acidity of soils, and of ground limestone to soil acidity, now in progress, deals with problems of fundamental importance to the farmers of large areas of the state.

Department of Entomology.—One entomologist is investigating the method of control of the green apple aphis, a serious pest of the foliage of young apple trees, the woolly apple aphis, and the apple and peach tree borers—all important insect enemies of our fruit growers. He also has charge of the inspection of the nurseries and orchards of the state for insect pests and plant diseases. Another entomologist is preparing for publication the results of a long series of experiments on the relation of temperature to insect life, deter-

mining the fundamental laws of temperature as related to the development of insects.

Department of Horticulture.—The horticulturist and his assistants are conducting experiments to determine the best fertilizers for potatoes and what varieties are best, are breeding more productive strains, and are showing that seed potatoes raised in the high altitudes of West Virginia are as good for seed in southeastern Virginia as those from Maine; a careful investigation of the best methods of pruning fruit trees to promote fruit-bearing is being made; experiments are being carried on to determine the cost and profit of thinning apples; variety tests are being made of strawberries, bush fruits, plums, sweet potatoes, apples, and peaches; experiments are demonstrating the method of spraying for the control of the bitter rot of the apple; studies are being made of the development of improved strains of sweet potatoes and strawberries by bud selection and of the principles involved; it has been demonstrated that peach trees can be grown in the same places where trees have died from "yellows" in a large orchard at Romney; experiments are being made to determine the effect on young trees of blowing the holes for planting with dynamite; an orchard survey of Berkeley county is being made, and this will be continued in the other principal fruit counties; the best fertilizers for tomatoes have been studied for several years; the methods and profit of renovating old neglected orchards have been demonstrated in various parts of the state. The associate horticulturist is now devoting all of his time to truck crops, and during the next year extensive investigations looking toward the development of truck growing will be inaugurated.

Department of Plant Pathology.—The plant pathologist is making a thorough study of apple leaf diseases, particularly of the cedar rust which caused large losses to apple growers the present season, and is showing by experiments how it must be controlled; he is carrying on extensive experiments in spraying potatoes to show the best methods of mixing and applying Bordeaux mixture, these experiments being particularly timely and of immediate practical value in view of the general injury to potatoes by late blight during the present season; a careful investigation of the causes and means of control of potato tip burn, which is caused by drought and was so prevalent in the dry season of 1911, is being made; in co-operation with the experts of the U. S. Department of Agriculture demonstrations are being made of the methods of eradicating and controlling the collar-rot of apple trees, which has caused the death of thousands of the most valuable bearing apple trees in the principal fruit regions of the state.

Department of Poultry Husbandry.—The poultryman is studying how the hens should be managed and fed to increase the vigor of the young chicks, and the most practical way of brooding chicks artificially; during the past summer he has distributed over one hundred lots of White Leghorn cockerels to farmers throughout the state at cost, thus assisting in the general distribution of better breeding stock.

The results of the investigations of the station are published from time to time, in bulletins, which are sent free to all persons requesting them. About ten thousand citizens are now receiving these publications as issued. Through the means discussed above and others, which limited space will not allow us

to mention, the experiment station has done a great work for the farmers of West Virginia, and if properly supported, can serve them even better in the future.

It will be observed that, although the station is doing effective work in the investigation of problems in horticulture, farm crops, poultry, and soil fertility, nothing has been done for many years in the interest of the live stock industry or of forestry, two of the principal sources of income to West Virginia farmers. A dairyman has just been appointed to study the needs for developing the dairy industry in the state and for making investigations which will assist to that end. An assistant has been appointed to have charge of some work with beef cattle, sheep, and swine. The station should have a well equipped department of animal husbandry, with a thoroughly trained practical live stock man in charge and with proper facilities and funds for making investigations which would be of immense value to the leading agricultural industry of the state.

The state should also appropriate funds for the employment of a forester who can establish nurseries of forest trees, make experimental plantings in co-operation with owners who wish to re-forest cut-over lands, and advise owners of timber lands as to the best manner of cutting and reforestation. The better conservation of its timber and the reforestation of large areas of otherwise waste lands is one of the most important economic problems before the state, toward which practically nothing has yet been done. With relatively small appropriations in addition to its present income, the station could institute work along these lines which would repay the state many fold.

The U. S. Department of Agriculture has signified its willingness to co-operate with the State in an investigation of the irrigation of truck crops in the Ohio valley by pumping water from the Ohio river into the lowlands so well adapted for such work. There are great possibilities for trucking in this section, and this is a project which should receive the attention of the state. It is also highly desirable that some investigations of the tobacco industry in the southwestern part of the state should be inaugurated. It is probable that the co-operation of the U. S. Department of Agriculture can also be secured in this project. These lines of work must be supported by state appropriations if they are to be undertaken, as the station now has no appropriations from the state government, and the funds appropriated by Congress are required to be used strictly for investigations and experience and not for the general promotion of any agricultural industry. When it is considered that according to the official reports of the Office of Experiment Stations, U. S. Department of Agriculture, the United States government has contributed \$374,968.71 under the Hatch Act since 1888, and \$72,109.12 under the Adams Act since 1906, or a total of \$447,077.83, to the support of the Station, and that the state has made no appropriation toward its support except the \$4,000 to the director by the last two legislatures for horticultural work, and when it is further considered that in 1910 (later figures are not available) 35 of the 48 states appropriated \$1,316,370.06 for the work of these stations, or an average of \$37,610 per state, it would seem that the state has some obligation for the proper support and development of the work of its Agricultural Experiment Station.

Division of Agricultural Extension.

The Agricultural Extension Division of the College of Agriculture aims to carry the latest scientific and practical agricultural information to persons in rural sections who are interested in the advancement of their farm methods but who find it impossible to attend a course at the University. It aims to show the young people of the rural sections the real worth and dignity of a country life, and thus inspire them to remain on the farm and to make the land produce greater yields than were ever produced by their ancestors. It is also one of the greatest means of getting the people of the state in touch with the College of Agriculture. The following forms of extension work have been conducted:

1. *Agricultural Extension Schools.* It is quite possible that West Virginia was among the first states in the United States to hold agricultural extension schools. The schools are held by the Agricultural College instructors and practical agricultural experts, at centers throughout the state where people have guaranteed sufficient attendance and provided a place in which the school may be held. The schools last for four or five days, with possibly an evening meeting for the public and a couple of special sessions for school children.



AN AGRICULTURAL EXTENSION SCHOOL, SHINNSTON, W. VA.

Instructional and practical work is given in three courses selected by the local people from the following: soil fertility, farm crops, horticulture, dairying, and animal husbandry. The work is given in the form of lectures and illustrated by the use of charts, maps, drawings and such apparatus as the instructors can carry with them; also stock, fruits, etc., furnished by the community.

The following agricultural extension schools were held during 1911 and 1912:

Date	Locality	County	Number Student	Leading Subject ^s
1911				
Feb. 4	Keyser	Mineral	46	Horticulture
Feb. 6-11	Pullman	Ritchie	27	Animal Husbandry
Feb. 13-17	Romney	Hampshire	52	Horticulture
March 13-17	Cairo	Ritchie	52	Animal Husbandry
March 20-24	Sinks Grove	Monroe	34	Dairying
May 22-26	Gaston	Lewis	21	Animal Husbandry
Dec. 18-22	Burnt House	Ritchie	26	Animal Husbandry
1912				
Jan. 8-12	Moorefield	Hardy	12	Horticulture
Jan. 15-19	Shinnston	Harrison	38	Horticulture
Jan. 22-26	French Creek	Upshur	27	Horticulture
Jan. 29-Feb. 2	Mountain Cove	Fayette	11	Horticulture
Feb. 19-23	Kingwood	Preston	25	Animal Husbandry
Feb. 19-23	Petersburg	Grant	30	Horticulture
Feb. 26-Mar. 1	Sinks Grove	Monroe	25	Animal Husbandry
Feb. 26-Mar. 1	Metz	Marion	44	Horticulture
March 4-8	Dunleith	Wayne	17	Animal Husbandry

Many striking instances have been observed of the value of these schools. A man in Monroe County, who attended a school at Sink's Grove, was impressed with the instructor's lecture on hot house lambs. His market for lambs had been very low. He followed the instructor's plans and cleared \$6.36 on the first hot house lamb sent to New York. He now expects this to become his most profitable and leading form of agricultural work.

Fruit Packing Schools.—Seven fruit packing schools were held in orchards at Springfield, Three Churches, and Points, Hampshire County, Kearneysville, Jefferson County; and Martinsburg, Berkeley County. These schools, which were practical work in packing fruit in the orchard, lasted from one to eight days each, and had a total attendance of about 150 men. Many other men from the communities attended these schools, but did not take actual work.

2. *Home Economics Schools.*—Home economics schools for women were held in several counties at the same time and place where agricultural schools were held for men. Five of these schools were held last year by the Agricultural Extension Division, and they have proved both popular and beneficial. The state is probably under more obligation to teach the women scientific housekeeping than it is to teach the men scientific farm keeping. The women should have a chance to study and to see demonstrated the most up-to-date and scientific methods of preparing food for the family and listen to lectures on the best and most economical means of keeping the home. Much of the work in these schools is in the form of demonstrations. The rooms in which these schools are held are equipped with stoves and tables by the local people, and the instructors carry the cooking utensils, charts and illustrative material with them. A registration fee is charged those who attend. One lady who attended one of these schools remarked "I did not know I had been so extravagant in my cooking. I certainly will be able to reduce the cost of living at our home and at the same time give the family better food".

The following home economics domestic science schools have been held:

Feb. 26-Mar. 1.....	Sinks Grove.....	Monroe.....	23
March 4-8.....	Dunleith.....	Wayne.....	12
March 12-15.....	Bluefield.....	Mercer.....	13
April 16-19.....	Weston.....	Lewis.....	47
April 23-26.....	Bridgeport.....	Harrison.....	52

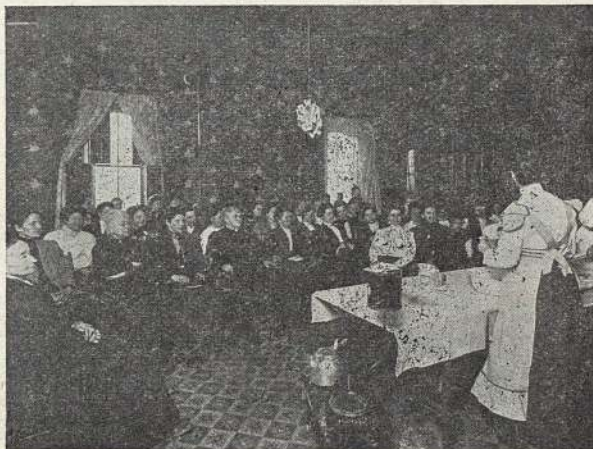


Stock Judging—Dairy School at Sinks Grove, Monroe County, W. Va.

As the agricultural schools for men and the home economics schools for women give the people of the rural communities a condensed college course at their very door, sufficient of these should be provided to reach every county of the state. The entire service of at least one domestic science instructor is particularly needed at this time to give lectures and demonstrations on foods and their values, cooking, canning, preserving, home decoration, labor saving devices, etc. Several additional agricultural instructors are also needed—one in soils and crops, one in animal husbandry, one in truck gardening, and one in dairying.

3. *Boys' and Girls' Agricultural Clubs.* The great problem among the farmers is to keep the boys and girls on the farm. There is no better way of solving this problem than to give the boys and girls a share of the products of the farm, and for the College of Agriculture to interest and to honor them by assisting in their work. The rivalry of the club members in securing the largest or highest scoring yield creates great agricultural enthusiasm among their parents and friends. Mr. E. W. Sheets, of the Agricultural Extension Division, in co-operation with the U. S. Department of Agriculture, has this

work in charge and has county organizations in thirty-two of the fifty-five counties of the state. Several other counties have club members but have not formed county organizations.



A HOME ECONOMICS SCHOOL AT WORK.

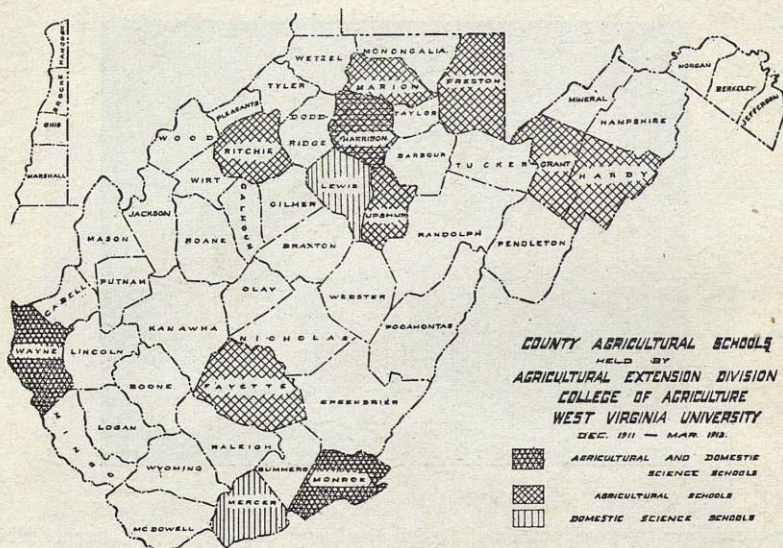
Practical problems of the home are discussed and demonstrations given. They are learning more of the WHY, that they may know the better HOW.

The enrollment in these clubs this year is a little over 4500; the previous year's enrollment was about 1500. Corn is being grown by practically all of the club members. The girls are growing tomatoes. The seed in most part was furnished by the College of Agriculture, and each organized county has offered prizes to about the amount of \$100. Definite instructions have been given the members as to the growing of the crop. Those winning the highest county prize will compete in the state show. The highest prize offered is a farmer's agricultural short course at the College with all expenses paid, or a free trip to Washington, D. C. About fifty meetings of superintendents, teachers, patrons and friends of the schools were attended and addressed on club work. Two circulars of instruction were printed, several thousand letters written, and nearly 5000 membership pins distributed to the members.

A girl in Wetzel county, who is a member of the girls' tomato club and who secured seed from the College, grew and set the plants, was given instructions in canning the ripe fruit, and cleared over \$16 from one-twentieth of an acre. This money was cleared from the sale of canned goods and ripe fruit after paying all expense for the work. The same girl has started a bank account of her own, and expects to educate herself. This is but one example of what scores of other girls are doing in this same county.

The members of the boys' corn clubs of Hardy and Marion counties conducted variety corn tests for their counties to demonstrate the highest yielding variety of corn grown in the county. They found that there was a dif-

ference of several bushels in the yield of the varieties planted. This test will result in demonstrating to the farmers of the county that they are losing many dollars every year by not growing the most economic yielding variety of corn for their farms.

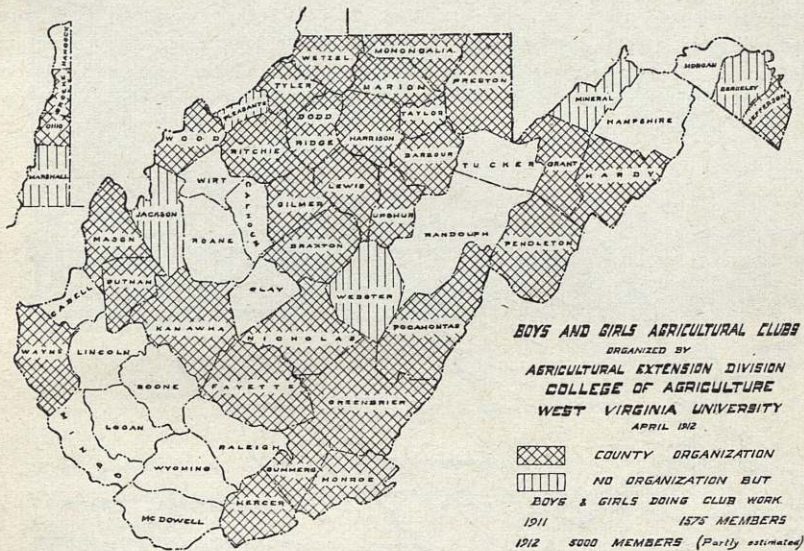


A boy in Monongalia county was so much interested in his corn work, talked of it so frequently with members of his family, was so successful with his work, secured such bulletins and instructions embodying helpful suggestions and indicating the many opportunities for men of training in agriculture, that his older brother attended the College of Agriculture for a winter term, and **also** attended the Short Course. The possibilities of better farm and home life have been emphasized, and the boys and girls are thus living examples of the work.

One-half of the salary and expense of the state agent in charge of this club work is paid by the Office of Farm Management, Bureau of Plant Industry, U. S. Department of Agriculture, under which office the work is brought into touch with similar work in other states. A senior student in the Department of Home Economics has been appointed temporarily to develop the girls' canning work, and it is hoped that it will be possible to employ her in co-operation with the U. S. Department of Agriculture so that she may give her whole time to the work another year.

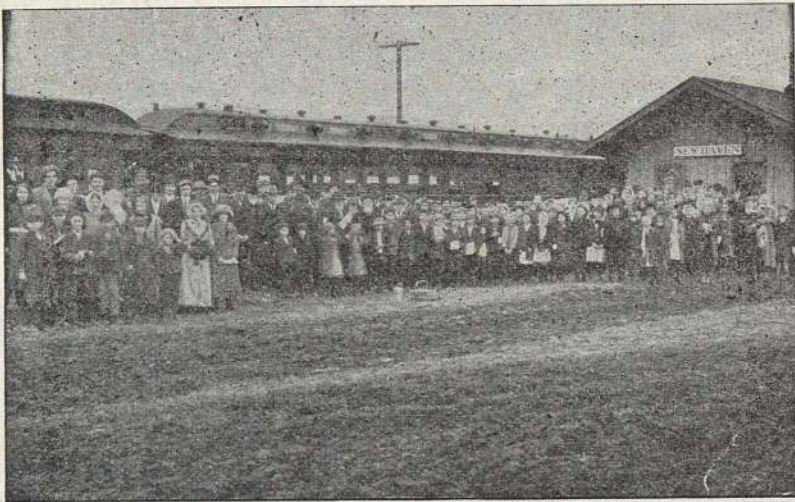
It is also hoped that within the next two years every county in the state will have a well organized boys' and girls' agricultural club, and that at least 12,000 boys and girls will be enrolled as members. It is not intended to confine the work of the boys to corn alone, but as soon as feasible to have contests in growing potatoes and other crops, and in the growing of fruit, raising of poultry, hogs, sheep, etc. It is not thought desirable to diversify the work too much at first, as greater interest can be aroused by concentrating the attention of the contestants upon one subject at a time until the work is bet-

ter organized and can be more easily supervised. The greatest need to make this work effective is more local supervision. In this the county agricultural agents may be of great assistance. Wherever district school superintendents are employed the most suitable arrangement would be to have them in charge of the organization of their districts.



4. *Agricultural trains.* Four agricultural trains have been run over the C. & O., K. & M., and B. & O. railroads, at a small expense to the state. Lectures were given to 17,400 people, 98 stops of 1½ hour each being made in 29 counties; 22 days were required for these routes, which covered 11,074 miles. The train, which usually consists of three lecture coaches for men, one for women and children and a baggage car, was furnished free by the railroad company. Sleeping and dining accommodations were provided by the railroad company for part of these trips. The Chamber of Commerce of Charleston was instrumental for the running of the train over the K. & M. lines. This Chamber of Commerce believes that the amount of vegetables and fruit shipped into Charleston from outside the state could be grown more profitably, and at the same time sold to the people of Charleston at a less price, in the fertile valleys around the city. More than \$1,500,000 worth of vegetables were shipped into Charleston in 1910 from outside the state. As a direct result of the lectures given on the K. & M. train in the spring of 1912, one man situated three miles from Charleston was encouraged to grow 1½ acre of vegetables, for which he received \$1,204.65 during the past season. This man had been engaged in the truck business on a small scale, but the instruction received on this train encouraged him to materially increase his acreage so that it formed the principal source of his income.

Lectures were given on these trains on soil fertility, seed corn germination, spraying of fruit trees, market gardening, raising poultry, packing of fruit,



This crowd of old and young persons were on the Agricultural Special Train. The train was at the station for one and one-half hours. Lectures were given in the coaches.

One hundred and three of these demonstrations were given in 1912 at orchards in different counties of the state where the farmers from the community could easily gather, and were attended by 3304 persons. A few trees were pruned and sprayed, and a lecture on fruit growing given and questions answered at each demonstration. The community in which the demonstration was given was requested to furnish spraying material and in many cases the spray outfit. They conveyed the instructor from the railway station to the orchard and return. This is a more direct and beneficial way of giving instruction in pruning and spraying than can possibly be given in the lecture room. Records on file at the College show that about 25 demonstrations of this kind were given in the spring of 1911. Applications have already been received for 1913. The increasing number of requests for this work, together with reports of retail merchants as to the increased sale of spray outfits and spraying material, plainly shows that this is a profitable kind of agricultural extension work.

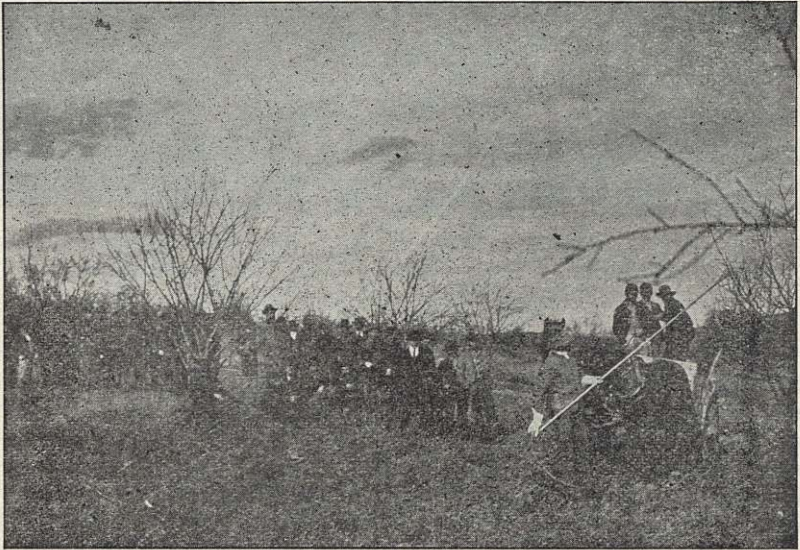
Many illustrations of the practical value of these demonstrations could be easily given. In the vicinity of Shinnston, where several spraying demonstrations were held, it is stated that scarcely a farmer sprayed fruit trees previous to this year. During the present year, however, fifty per cent of them have sprayed their trees and have received remarkable profits for the time and money spent at the work. It is a conservative estimate that at least eighty per cent in this section will spray their trees another year.

The Moundsville Echo states: "In the Echo fair window is a box of as fine apples as were ever on display anywhere. They are of the old-fashioned Harvest variety. The tree on which these apples grew was sprayed last spring by the Department of Agriculture, West Virginia University, and the fruit

is evidence of what a little time and scientific work will do for the fruit industry of this section."

In one section of Lewis county, where farmers are required to spend four days in getting an instructor from the railway station and return to it, it is stated that twenty-five spray outfits have since been purchased and that at least twice that number of farmers have sprayed their orchards.

In another section commission merchants, who refused to buy apples grown in previous years, this summer tried to engage entire crops of those farmers who had followed up the spraying as outlined by the Extension Division.



A Spraying Demonstration.

6. *Demonstration projects.* Horticultural, corn variety, soy bean, fertilizer, market gardening and seed corn demonstration projects are being conducted at thirteen farms in different counties of the state. These projects are to be carried on from one to fifteen years. The College of Agriculture has furnished part of the trees, seed or fertilizers for these demonstrations and supervision of work for all. These demonstrations are placed on farms in sections where they can be easily visited by all interested farmers of that particular community and be of benefit to a large number of persons. Many more requests were made for this form of extension work than the College had funds or instructors to conduct, but it is hoped that they may be taken up another year.

Funds should be available so that field demonstrations showing seed selection, seed variety tests for yields, use of fertilizers, rotation of crops, care of orchards, etc., may be placed all over the state and properly supervised by a representative of the College of Agriculture. It is particularly desirable that field demonstrations should be conducted on the value of lime. Large areas

to the rural school teachers and pupils of the upper grades. The bulletin is also sent to many farmers upon request, who state that they have found it helpful in their work. During the present year the bulletin consists of definite directions for teaching agriculture in the country schools in connection with the text adopted by the State Text-book Commission. About five thousand copies are now being mailed each month. The Division has also issued a circular explaining the work of the boys' and girls' agricultural clubs on corn growing, and several horticultural leaflets for distribution on agricultural trains and for answering correspondence.

9. *Correspondence and press work.* A great many agricultural inquiries come to the College of Agriculture by mail during the entire year, to which immediate and careful attention is given and replies sent. It has been shown that where one farmer will write to a college for information there are many in the same community and a great number in the state who are desirous of having information on the same question but hesitate to ask it by correspondence. To help the latter class, the most important inquiries and those of general interest, together with brief articles of agricultural information, were formed into two-page articles, under the title of Agricultural News Notes, and sent to every newspaper in the state. This work was started in May, 1912.

The Extension Division is also preparing each month a full newspaper page of agricultural articles, known as the West Virginia Farm Improvement Page. This is put in plate form, and sold by the Western Newspaper Union to all West Virginia newspapers desiring it. From sixty to seventy-five newspapers subscribe for this plate and publish it at intervals. These newspapers are also sent free of charge two columns of plate of general news concerning the University, particularly its agricultural work. One hundred papers are receiving this matter. The newspapers of the state gladly co-operate with the Extension Division in this work, and it is appreciated by their readers.

10. *Other agricultural extension work needed.* In addition to continuing and enlarging the lines of work above outlined, the Extension Division should have sufficient funds so that it may take up other lines of effort indicated below.

County fair exhibits. County fairs are becoming more and more agricultural educational meetings, and the College of Agriculture should assist in this work by placing at every county and state fair a carefully arranged educational exhibit. This exhibit should show in concrete form the results of agricultural experimental and demonstrational work, and also exhibit plant diseases, injurious insects, soil analysis, models of farm buildings and farm equipment. Demonstration work as conducted in the county should be given prominence in this exhibit. Instructors should accompany this exhibit to give such information as would fully explain the particulars of it and also to give public lectures and demonstrations in testing milk, pruning trees, judging stock, etc. Funds should be provided to equip such an exhibit, a tent in which it may be placed, and the necessary expense of taking it to the fairs.

Farm visitations; special agricultural meetings and lectures. Managers of state and county institutions, farmers and many organizations are requesting the College of Agriculture to aid them in making their land more productive and to meet them in special agricultural meetings. The College at present is not able to grant more than a small per cent of these requests. It is a profitable kind of extension work, and should be encouraged.

Agricultural education. A man is needed at the University in agricultural education. One-half of his salary and expenses should be paid by the Extension Division, that he may assist the teachers of the state in outlining and teaching agriculture in the rural schools. He should hold special agricultural institutes for teachers, visit the regular annual teachers' institutes, and issue bulletins that would assist the teachers and their pupils in this work.

County Agricultural Demonstrators. Possibly the most important future development of the work of the Extension Division will be in its supervision of county agricultural demonstrators. During the last thirty years science has laid the foundation of modern agriculture. For the last twenty years the state agricultural colleges and experiment stations, the United States Department of Agriculture, the state farmers' institutes and departments of agriculture, and other agencies, have been attempting to bring this mass of information to the farmer and secure its practical use by him. Until recently this was done entirely by the publication of the results of experiments and investigations and by their discussions at various public meetings. However, the bulletins were often laid away to collect dust, and the most convincing addresses seemed to fail to make any lasting impression upon the mass of the audience, though both of these lines of effort produced note-worthy improvement in American agriculture. Demonstration farms were then tried, locating them in typical sections, where the best methods in use might be readily studied by the farmers of that region. These failed to produce any large results, because the average farmer looks upon any farming supported by government appropriations as impractical and asserts that he could produce as good results if he had the capital. Gradually it came to be appreciated that the way to convince the farmer is to secure his co-operation in trying some new method on his own place and by keeping his own records to determine the results for himself. Obviously, this requires a man to induce him to make the attempt and to supervise his work and results. It is unnecessary to trace the early development of this idea. It is sufficient to state that it was first adopted in this country in a large way by the organization of the Farmers' Co-operative Demonstration Work under Dr. S. A. Knapp, by the United States Department of Agriculture in 1904, in an effort to help the southern farmers meet the invasion of the Mexican Cotton Boll Weevil. The success of this work is now known to all interested in agricultural work, and has been fully described in the year-books of the U. S. Department of Agriculture for 1909 (page 153) and 1911 (page 285). Dr. Knapp placed a county agricultural demonstrator in each county of his territory. This agent traveled among the farmers of his county, became acquainted with them, and persuaded some of them to agree to cultivate small areas of cotton and corn according to the direction of the U. S. Department of Agriculture. These men are known as demonstrators, and are visited frequently by the county agent and make a report to him of their work. The county agent also suggested and urged the diversification and rotation of crops, and thus secured better crop culture and better farm management. The results of this work were so obvious and so satisfactory that various northern localities commenced to plan for similar work. Meanwhile a considerable amount of demonstration work had been done by the agricultural experiment stations and extension divisions of the colleges of agriculture in the north, and they had become convinced that it was the method to reach

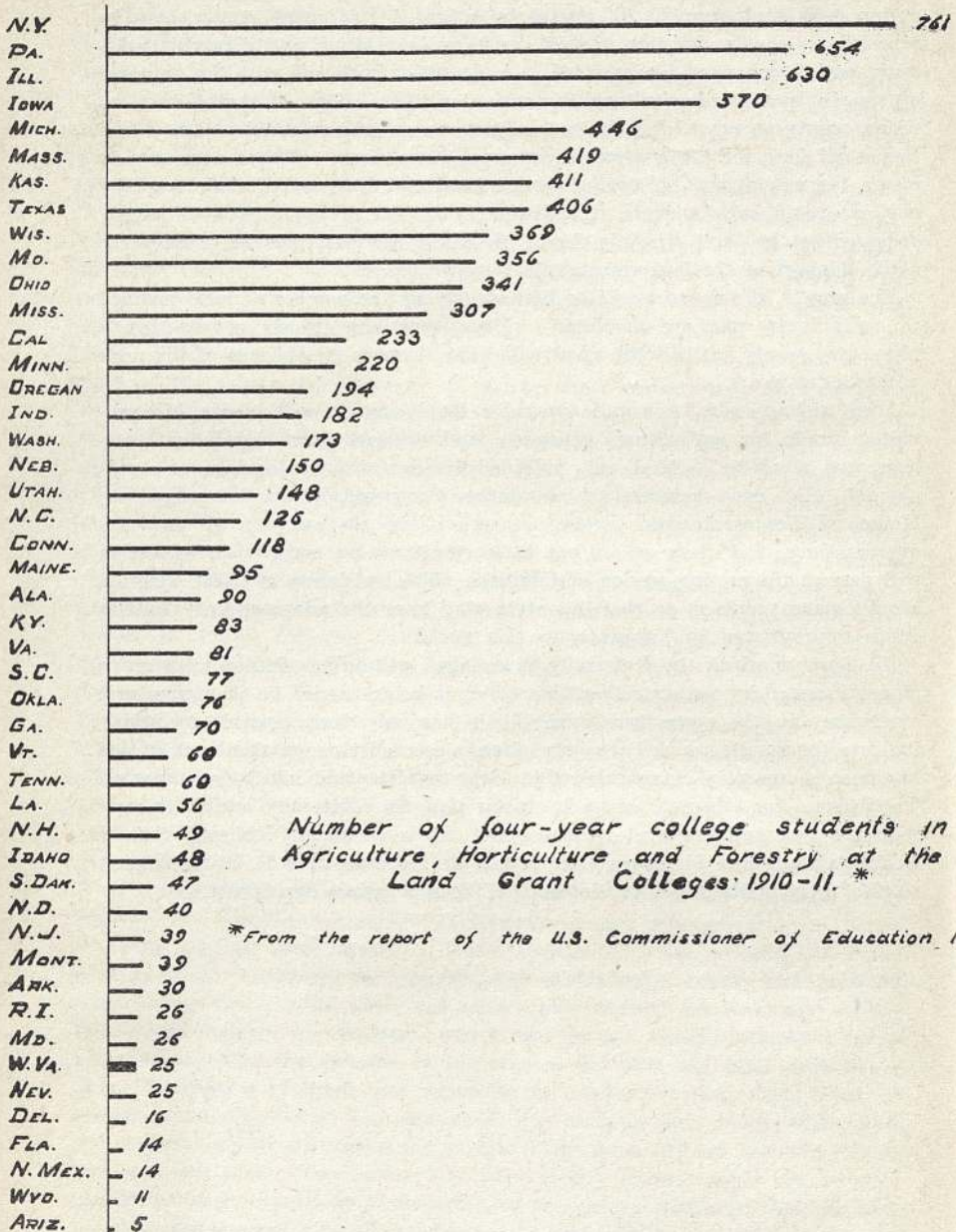
the farmer most effectively. It was apparent that to make demonstration work most effective it must be in charge of a local agent who is familiar with the community, its people and its needs, and that it is uneconomical to attempt to handle a large amount of demonstration work over a whole state from a central office. We have also come to appreciate that but very little attention has been given to the business organization of the farm, although in very many cases it is this lack of business system which has caused the farmer's failure. To study the business side of farming the U. S. Department of Agriculture has organized a very efficient Office of Farm Management, in the Bureau of Plant Industry. This office has agents throughout the country studying systems of farm management. It is now co-operating with the agricultural colleges and experiment stations in placing a farm management leader in each state. Congress has made a small appropriation to this Office with which to pay part of the salary and expenses of county farm management demonstrators in such counties of the non-cotton-growing states as will raise the balance of the cost. These county demonstrators work under the state leader located at the state college of agriculture. It is their duty to make a thorough study of the agricultural conditions and possibilities of their county; to induce their farmers to try new methods and new crops on their farms, and to make careful records of the cost of production and profit and loss; to help farmers plan crop rotations and general plans of farm management; to aid in organizing boys' and girls' agricultural clubs and organizations of farmers and their wives; to attend farmers' institutes and agricultural schools; to aid their farmers in securing and testing better varieties of seed; to aid in securing better markets and a better knowledge of market conditions; in short, to do anything in their power to aid the farmers in their county to better farming. These men also make detailed farm survey studies, the results of which are sent to the state leader for studying the cost of farm operations and the profit or loss in various systems of farming. A state leader is now stationed at the College of Agriculture of the West Virginia University, and this will form part of the work of the Extension Division of that institution. A county agent is now employed in Kanawha county, part of his salary and expenses being paid by the Charleston Chamber of Commerce, and arrangements are being made for placing three agents in Wood, Cabell, and Ohio, Brooke and Hancock counties. Although the demonstrator in Kanawha county had been at work barely two months when this report was written, the Secretary of the Charleston Chamber of Commerce states that he has already secured a large acquaintance with the farmers of the county, and that the good work he is doing is already apparent and arousing the widest interest. This work is receiving the very hearty co-operation of the business men of the state, and it is believed will be very generally supported by them. It has been suggested, however, that there is no reason why these county agents should not be supported, at least in part, by taxes levied by the county courts, so that the cost would be borne equally by all and not by the few. This can not be done without the enactment of a law by the legislature empowering the county courts to levy taxes for this purpose. Such laws have now been passed in several states, and we urge the enactment of suitable legislation to this end by the legislature of West Virginia. Such a law would involve no state appropriation, and would make the matter of supporting such county work a matter of local

option with each county. It should be provided how much money may be raised by a county for this purpose, possibly in relation to its taxable valuation, and that it must be expended in co-operation with and with the approval of the Division of Agricultural Extension of the College of Agriculture, to whom county agents shall make such reports as may be required and to whom they shall look for the general direction of their work. This is necessary to insure the employment of competent men and the direction of their work by one expert in such matters. The passage of such a law was unanimously endorsed by the West Virginia Board of Trade, who will give its passage the active support of the business organizations of the state.

The growth of this work will be limited only by the number of men qualified to carry it on who are available. Experience has already shown that a competent county agricultural agent will many times repay the cost of the work within a few years.

State aid needed. It is quite probable that Congress will pass a bill providing funds for agricultural extension work to each state agricultural college now receiving federal aid, provided these states appropriate an equal amount. Two such measures are now before Congress, and one has passed the House of Representatives. These measures have the support of powerful organizations, and there seems but little question that some such legislation will pass at the coming session of Congress. The legislature of West Virginia should make provision so that our state may have the advantage of the first funds appropriated by Congress for this work.

No work in which the University is engaged will bring greater returns for money invested by the state than that which is being carried on in agricultural extension. In the space here available it has only been possible to briefly indicate the results which have been already secured through this work, which has been so recently inaugurated that large results could hardly be expected. The demand for this work is much greater than the University is able to meet with the men and funds at its command. It is confidently believed that if this extension work is properly supported by the state it will be the largest single factor in the rapid development of West Virginia agriculture.



This diagram shows that West Virginia is not doing its share in preparing experts in agriculture. The number of agricultural students is increasing rapidly and, if properly supported, this important branch of our State University will soon make great growth.

Increased Attendance of Four Year Students at Certain Colleges of Agriculture, 1903 to 1912*

	Georgia A. & M. College	University Illinois College Agriculture	Purdue University College Agriculture	Kansas Agr. College	Mich. Agr. College	University Minnesota College Agriculture	University Missouri College Agriculture	Cornell University College Agriculture	Ohio State Univ. College Agriculture	Pa. State College Agriculture	W. Va. University College Agriculture
1903.....	10	138	42	219	127	18	95	60	87	14	2
1904.....	22	160	46	198	148	60	200	77	101	15	3
1905.....	15	123	76	162	152	29	76	98	119	14	4
1906.....	18	139	73	178	150	50	117	128	138	31	4
1907.....	34	368	87	197	162	72	121	278	124	47	5
1908.....	27	437	108	215	275	116	164	348	124	88	7
1909.....	29	483	165	291	329	145	239	415	162	57	9
1910.....	53	543	204	241	388	243	264	416	211	337	13
1911.....	73	631	266		512	324			389	‡374	20
1912.....	103	710	319	362	497		457	789	584	‡417	36

*From Reports office of Experiment Stations, U. S. Dept. Agriculture 1910, latest official figures published for 1903 to 1910, and from catalogues of institutions 1911 and 1912.

†Approximate.

The Normal and Preparatory Schools' Part of the Rural Program.

Any thinking man will agree that the teacher holds the critical position in the affairs of our state. This influence is becoming greater and greater as modern society is taking the child more and more from the home and increasing the time which it is under the exclusive direction of the teacher. An analysis of the conditions in West Virginia shows that there are 201,331 children in the elementary rural schools of West Virginia. The figures also show that not more than six or eight thousand of these are in schools of higher grade than the elementary schools. Then we are forced to conclude that we must reach the main part of the next generation by our work in the elementary schools. Since the teacher is the principal factor in these schools, and since the normal school is the place where elementary teachers are supposed to be trained, we are forced to conclude that the normal schools have an extremely important place in our educational scheme. In the past our normal schools have been compelled to take the place of high schools, and now that our high school system is being well established, we should turn the work of our normal schools exclusively and directly to the training of teachers for the two hundred and seventy-five thousand children in the elementary schools of the state, and since two hundred thousand of these children are found in the rural schools it is plain to be seen that the chief interest of our six normal schools should be in giving training peculiarly adapted to the needs of rural school teachers. Unfortunately, the conditions in the past have caused our brightest young teachers from the rural districts to enter the normal schools, take the training based for the most part on conditions and needs of city schools and leave the work of the rural schools to the untrained teachers who use their experience in the rural schools as a kind of experimenting period preparatory to some more attractive work. The plain fact is, that about 60 per cent of the students of our normal

schools come from rural districts, and only about 32 per cent of the graduates of the normal schools find their way back to the rural schools.

At present, about 3000 students are being prepared in our normal schools. We recall that we need in West Virginia at least 8000 elementary school teachers. Indeed about 2000 elementary teachers begin the work each year and only about 250 teachers graduate annually from our normal schools. At present, only 8 per cent of our entire teaching force are normal school graduates and probably not more than 4 per cent of the elementary teachers in rural districts are trained in our normal schools. The normal schools are doing fine service for the state, but the figures above show the great demand for their immediate expansion.

We do not claim that training for rural teachers should be different in all respects from training for teachers for the towns and cities, but we do insist that there are certain problems peculiar to rural schools which should be given special attention by our normal schools. In order to supply this demand we believe the normal schools should offer a large number of subjects, giving special attention to rural problems such as Rural Economics, Rural Health and Sanitation, Rural School Management and Supervision, Agriculture in its various phases and Home Economics. For some time it will be impossible to make conditions in the rural schools sufficiently attractive in respect to salary and other conditions to attract teachers who have taken a complete long course. Therefore, we recommend that the legislature pass a law permitting the state normal schools to offer a special short course for rural teachers, the completion of which will entitle the one who takes the course to a short-time certificate, good in the elementary schools and renewable upon evidence of teaching ability and professional growth.

In addition to the attention to special subjects, and special short courses for rural teachers, some of our normal schools should provide training for a large number of special teachers and supervisors. Many of our smaller rural consolidated schools will need special teachers of agriculture and home economics, and will not be able to employ a teacher with college training, hence we must expect our normal schools to help supply this demand. Although they should not undertake to equip supervisors, they should offer work which will start many young men and women on the road to preparation for district superintendencies and other positions of leadership in rural education.

In the form of a summary, the relation and duty of our normal schools toward rural schools and rural life can be stated as follows:

- (a) The children in the rural schools of West Virginia number 201,331.
- (b) The number of these who never get beyond the elementary school amounts to about 95 per cent.
- (c) This great class of our future citizens must be given their training and life ideals by the rural elementary school teacher.
- (d) The six normal schools of West Virginia were established to train these teachers, and for that reason occupy the most important position in the line of institutions intended to make better future rural conditions.
- (e) On account of meager appropriations, special attention to graded school conditions, and the attractiveness of salaries and positions in the towns

and cities, most of the graduates of our normal schools have not returned to the rural schools.

Conclusions.

- (1). The normal schools should teach more about rural conditions.
- (2). The normal schools should offer special short courses so that great numbers of rural teachers can afford to take some training in the normal schools.
- (3). Salaries for rural school teachers should be made high enough to attract well-trained teachers.
- (4). The normal schools should be made centers for the study of rural school problems in the counties surrounding them.
- (5). The normal schools should have liberal support for making this needed expansion in their work. The equipment needed for carrying on this work will be discussed under another heading.

Educational systems properly begin at the top and work down. Our law makers will be blind to their duty to the 200,000 rural school children in the elementary grades if they fail to make an unusual effort to provide teachers who can give them training suited to their environment.

The Preparatory Schools. In the formal report of these institutions found in the beginning of this volume, the duty and opportunity of these schools, to serve the rural communities are suggested.

The High Schools' Part of the Rural Program.

This board has no direct connection with the high schools, but it is indirectly connected with them, since the normal schools and the state university must look to them to prepare large numbers of our young men and women for work in the higher schools. However, our chief interest in the high schools is based upon our belief that they are the schools which have the opportunity to go down to the people and give more than ordinary training for leadership to the great masses of the best young men and women in the different communities. Inasmuch as the high schools in their relation to the solution of the rural problems will be fully discussed in the report of the supervisor of high schools, we shall not presume to make extended comment here.

At the present time there are thirty-eight teachers giving instruction in agriculture in our high schools. The number of teachers needed for this kind of work in our high schools is growing very rapidly. All of these teachers should be prepared for this work in a standard college of agriculture. So here we find a great demand upon our college of agriculture and a great opportunity to reach large numbers of our best future citizens.

The supervisor of the high schools reports that agriculture should be taught in seventy-five high schools which directly serve rural communities in West Virginia. He further states that 5500 students will be attending these schools in a year or two, so here is an opportunity for our state college of agriculture to reach a fine body of the pick of our future rural citizenship through teachers thoroughly equipped with training and enthusiasm for this kind of work.

These high schools will not offer much assistance in bettering rural conditions until their ideals and work based upon these ideals are much changed.

Anyone doubting this statement should study the following table which indicates the number of students pursuing the different subjects taught in our high schools. For example:

In our high schools are enrolled young men and women numbering over	6,000
Of these the number studying agriculture is	468
The number studying algebra	3,695
The number studying domestic science.....	667
The number studying German	1,366
The number studying manual training	257
The number studying chemistry	372
The number studying Latin	3,574

Just so long as we insist that Algebra is worth more to the rural boy than a sensible study of agriculture; just so long as high school teachers insist that girls give four hours a day to German which they will never use and one hour per week to domestic science which should be of vital use to them all of their lives; just so long as the pressure of college entrance requirements causes 2,574 boys and girls to labor most of their high school days on Latin, while only 372 take a rich subject like chemistry; just so long as our high schools are content with such a program we cannot hope for much assistance from them in making richer the rural life of West Virginia. (See table at end of this article.)

This Board sees a better day coming for these high schools and strongly recommends that regulations be made and encouragement be provided which will have a tendency to turn these 75 rural high schools to a serious effort to become the real people's college for the particular communities where they are serving the public.

We join the high school supervisor in the following recommendations;

- (1). Liberal state aid should be given all high schools.
- (2). Special state aid should be given to rural high schools that come up to certain requirements in equipment and teachers for the teaching of agriculture and home economics.
- (3). The courses of study for these rural high schools should be based upon rural needs and rural ideals insteads of classical notions borrowed from former times and entirely different conditions.
- (4). The State University and normal schools should freely accept work well done in such a course even if it does not measure up to the standards of traditional entrance requirements.

The table referred to above follows:

Table Showing the Number of Students Pursuing Different Subjects in the High Schools of West Virginia.

Names of Subjects.	No. Boys.	No. Girls.	Total.
Agriculture	240	228	468
Algebra	1,591	2,004	3,595
Arithmetic	630	704	1,334
Biology	352	407	759
Botany	297	391	688

Bookkeeping	338	338	676
Chemistry	176	196	372
Civics	350	508	858
Commercial Law	39	70	109
Commercial Geography	135	134	269
Domestic Science		667	667
Drawing	512	618	1,130
Economics	39	21	60
English Grammar	896	1,144	2,040
French	70	239	309
Geology	103	131	234
Geometry, Plane	732	912	1,644
Geometry, Solid	135	178	313
German	510	856	1,366
Greek	000	000	000
History, General	248	322	570
History, Ancient	716	848	1,564
History, Med. and Mod.	298	458	756
History, English	403	553	956
History, American	325	470	795
History, Industrial	26	6	32
Latin	1,469	2,105	3,574
Literature, English	563	716	1,279
Literature, American	548	772	1,320
Manual Training	257	257
Music	1,039	1,524	2,563
Pedagogy	10	20	30
Physics	304	349	653
Physical Geography	644	828	1,472
Physiology and Hygiene	161	202	363
Psychology	7	25	32
Rhetoric and Composition	1,024	1,458	2,482
Stenography	104	94	198
Trigonometry	27	5	32
Zoology	87	99	186

The Elementary Schools' Part.

A central lighting plant might be thoroughly provided with powerful dynamos, engines and other equipment with which it could generate great quantities of electricity. From this plant great cables for conducting this electricity might be stretched from the central plant to the principal parts of the city. From these main conductors other smaller wires might reach the residences of the city. These residences might be thoroughly attached to these conductors with proper equipment. At the end of the house wires, chandeliers or lamps might be attached in sufficient numbers to provide the whole house with a flood of light. But, if for any reason these chandeliers or lamps are not properly supplied with the little bulb necessary to make the illumination, the house

would remain in darkness while the whole plant and system are in operation. In the same way the State University, the normal schools, the high schools and other higher agencies for education might be thoroughly equipped and working hard to produce and transmit proper educational ideals, but if the rural schools out at the very extremities of the system are not so attached and equipped as to reflect the light thus provided, at least seventy-five per cent of the boys and girls of this state must live in partial educational darkness. This figure of speech may be somewhat awkward and far fetched, but it certainly suggests the important position which the elementary rural school holds in our educational system.

The great Catholic church is supposed to work on the saying "give us the child until he is ten years old and we will guarantee his future beliefs." History and observation prove the soundness of this theory and the possibility of determining in a large measure the fundamental ideals of the adult through the teaching of childhood. Therefore, if all of this talk and effort for rural betterment is to be made effective, it must be concentrated in large measure upon the children in the elementary schools. The question then becomes, "How can the rural elementary schools further aid in giving the two hundred thousand rural elementary school children of West Virginia a firmer and a more sympathetic understanding of the opportunities afforded by rural life?" It is not the business of this Board or this report to attempt a complete answer to this large question. The following statements may be of some interest to those who wish to give the question further consideration:

1. The rural school must be more comprehensive in its organization.

(a). It should include within itself a larger unit of territory. This for most parts of West Virginia, will mean consolidation. Our rural children need the broader outlook and the greater enthusiasm which come from belonging to a larger neighborhood.

(b). The rural school needs to include a wider range of people. It should consider the adults of the neighborhood as a part of its organization. Whether it be as a farmers' improvement club, a grange, a school improvement league, or as a literary society, the people of the community should make the rural school house a place of occasional meeting for the discussion of the general welfare.

(c). The rural school must include a greater part of the year in its plans and organization. The length of the regular term should be increased to at least seven months and then some provision should be made to give the rural children social and industrial guidance and encouragement during most of the vacation period. In this state this can be best accomplished by requiring the district superintendent of schools to have special qualifications for giving instruction in home gardening and agriculture, and then fix the salary so that he will have charge of the boys' and girls' special work in agricultural clubs, home, flower and vegetable gardens, and act as general adviser to the farmers of the district. In this way the homes, gardens, and farms can be used as laboratories to demonstrate the theories discussed during the regular school term.

2. The rural school needs a specially prepared teacher. This statement

is made so often and discussed so much that little need be said here. With the present low salaries we cannot expect much special preparation on the part of our teachers. Even when salaries are increased we can hardly hope to attract to the rural schools teachers prepared in college or long professional courses. Believing this, we again urge short special courses in our normal schools for rural and village teachers. This course should cover about three years above the elementary school or standard eighth grade. In most places in West Virginia the ninth grade work could be secured in local high schools or by special personal effort on the part of the student. The work of the other two years of the course could be arranged so as to give the one taking it a clear understanding of the elementary subjects taught in the rural schools, considerable special knowledge about agriculture and rural economics and the enthusiasm and attitude necessary to make a teacher highly useful in a country school. For this course a short-time certificate could be granted and proper credits allowed in case the one taking it should desire to complete a more extended course. The main elements of such a course should be about as follows:

ENGLISH.

First Year—

A study of American classics and poems.

Simple composition work and spelling.

A study of two or three good papers and magazines pertaining to rural life and modern problems.

Second Year—

Reading and study of five or six rich books, at least three of which treat of rural life.

Clarification of grammar—the sentence, paragraphing, composition, punctuation, etc.

Continue the study of magazines.

Third Year—

About three days per week in study of American literature.

Continuation of composition work with one or two long papers based on actual observation.

Reading of several books or selections from the best English authors.

Continue acquaintance with magazines referred to in first year.

MATHEMATICS.

Arithmetic—

A thorough review of ordinary arithmetic.

A thorough study of tables, prices and calculations used by the best farmers. This part of the arithmetic should bring out a critical study of the losses and profits of farmers.

Algebra—

One year algebra might be offered in order to put the student farther on his way for more advanced courses.

SCIENCE

First Year—

A general science course. There are several good text books on this subject which give the simple elements of science which make a very good preparatory study for more definite science.

Second Year—

A simple course in biology. This course will naturally emphasize the biology most interesting and helpful to the farmer and will offer much information on injurious and useful insects, birds and plants.

Third Year—

A general course in practical agriculture. By this time the student will be sufficiently matured and interested to give with great profit a full year's work to a direct study of practical agriculture.

HISTORY.

First Year—

Some regular course offered in the regular work of the normal schools.

Third Year—

American History. In this course more than usual attention should be given to the important part played by the American pioneer farmers. During the close of the year some special attention should be given to the ways in which the government is assisting the people of the country and the corresponding duties of citizens in making better use of these means of assistance and devising other ways of co-operating with national and local officials for the good of the rural communities. In this course or in a special course in civil government, community life should be studied in terms of the school, the church, government, and social life.

HOME MAKING

One or two years of domestic science and domestic art should be offered in such a course. It may be necessary to make special provision for a term's work in rural sanitation and home equipment for the young men who cannot take the regular course under this heading.

PROFESSIONAL WORK

About one hour per day during one year should be given to simple, practical study of the most important questions which must be considered by the teacher who conducts successfully a rural or village school.

If our legislators will only consider that about two hundred thousand boys and girls in the rural districts must get all of their preparation for their life's work in the elementary rural school, they will certainly make extraordi-

nary effort to adopt any sensible plan for making the work of these very important institutions more effective. We offer the above by way of general suggestions and commend for careful study the annual report of the State Superintendent of Schools and the Supervisor of Rural Schools.

Public Institutions and Other Agencies Which May Promote Agriculture.

1. *State Commissioner of Agriculture and State Board of Agriculture.*—The last session of the legislature created the office of Commissioner of Agriculture, to be elected in 1912. It was the evident intention of the legislature that this Commissioner should assume the duties now given the State Board of Agriculture, but a recent opinion of the attorney general holds that the act did not abolish the Board of Agriculture and practically leaves the duties of the Commissioner to be determined by future legislation. The whole question, therefore, of the work of the state department of agriculture will need to be considered at the coming session of the legislature. There is a wide field of usefulness for the state department of agriculture in enforcing laws of benefit to the farmer. At present we have legislation and appropriations for the control of the diseases of animals and orchard fruits and for the inspection of fertilizers. Legislation is badly needed for the control of the sale of feed stuffs and seeds, for the proper registration and supervision of stallions and bulls, and for the better collection and publication of agricultural statistics. Such police and statistical work, and the encouragement of immigration to develop our agricultural lands, the collection and exploitation of agricultural exhibits at expositions, etc., and the encouragement of state and county agricultural fairs and agricultural organizations, give the State Commissioner of Agriculture the widest opportunity for great usefulness. It would seem that the present is an opportune time to clearly define the work of such a State Commissioner in relation to the work of the State College of Agriculture and the Agricultural Experiment Station. West Virginia has taken a forward step in bringing its institutions under the supervision of a single board of control, and the management of its educational institutions by one Board of Regents is being carefully watched by many other states. It is highly desirable that all the agricultural work supported by the state should be similarly unified in purpose, if not in organization. The experience of other states which have done most for the promotion of agriculture shows very clearly that there are three distinct activities in which the state should engage. The State College of Agriculture should have charge of all agricultural education supported by the state; the Agricultural Experiment Station should have charge of all agricultural investigations and experiments; and the State Department of Agriculture should have charge of all executive work such as has been outlined above. Each of these agencies should co-operate with the others, and in many ways may aid each other with a resulting reduction of expense to the state and increase of efficiency; but neither of them should be allowed to duplicate the work of the other. The lack of such adjustment in several states has caused unnecessary expenditures of state funds and unnecessary duplication of work. This has been so apparent as to cause general comment and careful study of the situation by the leaders of agricultural work throughout the country. We can not do better in this connection than to refer to a portion of

a most excellent address delivered by Professor John Hamilton, Farmers' Institute specialist of the U. S. Department of Agriculture, before the winter course in agriculture at West Virginia University in January, 1910, entitled "A Program of Agricultural Progress", and we would call particular attention in this connection to the paragraphs referring to the duties of the agricultural college, agricultural experiment station, the state department of agriculture, the national department of agriculture, and the securing of the proper apportionment of duties. We would also call attention to a similar very concise statement of this most important problem in an article by Dr. A. C. True, Director of the Office of Experiment Stations, U. S. Department of Agriculture, "How the States May Aid Their Farmers," in the Country Gentleman of May 4, 1912. Dr. True has had general supervision of the work of the agricultural colleges and experiment stations of the United States for the last twenty years, and no one has had better opportunity to study the problem of how the state may properly encourage agriculture.

2. *State Agricultural Associations.*—State organizations for the promotion of particular lines of agriculture have had a large influence in almost every state in the Union. They serve to bring the best speakers before those interested in particular lines of agriculture, at the annual meetings of these associations, and the published reports of these meetings are of great value to those who are unable to attend. Such associations also serve to bring together the leaders in each line of agricultural work, and promote enthusiasm for its advancement. This is also accomplished by the holding of exhibits of the best agricultural products in connection with their meetings. There are now organized in West Virginia the West Virginia State Horticultural Society, the West Virginia Sheep Breeders' and Wool Growers' Association, the West Virginia Dairy Association, the West Virginia Live Stock Association, the West Virginia Grain Growers' Association, the West Virginia Forestry Association, and the West Virginia Branch of the American Poultry Association, all of which are federated in the West Virginia Federation of Agricultural Associations. Practically all the leading agricultural states make appropriations to such organizations to cover the cost of speakers at their annual meetings, the publication of reports, and premiums for exhibits. West Virginia has made no such appropriation, and as a consequence these organizations are relatively weak, and have not been able to take any large part in the development of their respective branches of agriculture. It has been found impossible, both here and elsewhere, to support properly such organizations from the small membership fees. This state can well afford to support liberally all of these organizations by making appropriations for each of them to be expended by their officers but to be administered through the State Commissioner of Agriculture or State Board of Agriculture.

3. *Farms at Public Institutions.*—The state owns a considerable number of more or less valuable farms at the various institutions scattered throughout the state. Each of these farms should be developed so as to yield those products which can be consumed by the institution, and should also serve to demonstrate to the people of that section what may be done by the best known methods of farming. Although the management of these farms

should be left to the local institution, they should be under some general supervision to insure their best management. These farms may also serve in a limited way for field tests and experiments of a general nature in rotation of crops, adaptability of varieties, cost of production, etc., which may be carried on without interfering with the production of those crops needed at the institution. With such development, these farms might well be used for field meetings of farmers, at which the work they are carrying on could be demonstrated and explained.

The same line of work should be attempted upon county poor farms, wherever the county courts desire the co-operation of the experts of the Agricultural College and Experiment Station, and where they have managers in sympathy with such a development of their farms. The professor of farm management of the College of Agriculture, who is the state representative of the Office of Farm Management, U. S. Department of Agriculture, stands ready to aid in the planning and development of these farms as far as his time and resources will permit, wherever desired by their management.

4. *State and County Fairs.*—There is a great opportunity for the state to develop state and county fairs, so that they may be really educational institutions for the advancement of agriculture. For years the tendency has been to make them chiefly meetings for horse racing, with numerous side shows for profit and with the agricultural exhibits as a minor feature. There is now a general reaction throughout the country in favor of a re-organization of these fairs, so that they may be of real service in the promotion of agriculture. There are several small local fairs now held in the state, which have been of real value to their communities, and the state may well appropriate funds for premiums at such fairs under the general supervision of the State Commissioner of Agriculture. A recent development in the utilization of such fairs for educational purposes is the assembling of country boys at the fairs and the use of live stock and exhibits for their instruction in judging live stock, corn, grains, fruit, etc. The boys may camp at the fair for a few days and aid the management in many ways by working several hours a day in the erection and maintenance of exhibits.

5. *Granges.*—The principal farmers' organization in West Virginia is the Grange, or Patrons of Husbandry. There are now organized 64 local granges, with 1,731 paid and 1,843 delinquent members, making a total actual membership of about 3600. This organization is in no way connected with the state, but may well be utilized as the best means of co-operating with the various localities in which it is organized. The local grange may aid the extension service of the College of Agriculture in local demonstration work and co-operative experiments and in organizing and pursuing reading courses for farmers and their wives. The greatest usefulness of the grange, however, will be in maintaining a forum in which all the movements for the betterment of country life may be discussed, and through which the farmers of the state may find a means of expressing their wishes concerning all efforts of the state for the benefit of agriculture.

6. *Boards of Trade and Chambers of Commerce.*—Most of the cities of the state now have well organized boards of trade or chambers of commerce with paid secretaries. These organizations are showing a lively interest in promot-

ing better farming in their immediate localities. Several are now arranging for the employment of county agricultural demonstrators, and it is probable that the work of employing and establishing these demonstrators will very largely depend upon the initiative taken by the business interests through their local boards of trade. Such organizations may also do a large work in promoting local markets and aiding their farmers in securing better foreign markets and transportation facilities for their products. They may also aid in promoting the organization and exhibits of the boys' and girls' agricultural clubs and of agricultural fairs.

7. *Corporations.*—Many large corporations, particularly coal companies, own large areas of farm lands in West Virginia, which at the present time are practically idle. Many of these corporations are now coming to appreciate that these lands may show a profit if properly farmed, and are attempting their development. It has also been shown that the employees of these corporations are more contented, that their living income is materially increased, and that their home surroundings tend to gradually improve, wherever they are given sufficient land for maintaining a home garden. One or two of the largest coal companies in the state have offered premiums for the best home gardens and the best improved home grounds, with results which have been most gratifying in the improved condition. This sort of work should be encouraged by the state in any way possible, as it offers one of the best means for improving the living conditions of large numbers of employees upon whom the industrial prosperity of the state depends.

Estimates of Appropriations Needed.

Having presented the importance of rural development and education in West Virginia, the agencies available for this work, and their needs, we now present detailed estimates of the appropriations necessary to properly equip our state institutions to do the work which the people of the state are demanding.

The needs of the University will be considered first, for, as previously explained, the work of the University will have the largest influence in training teachers and leaders for this work, and without a University well equipped for properly training such workers progress through other institutions will be slow and faltering.

Estimates of the University's needs will be presented in the same order as previously discussed.

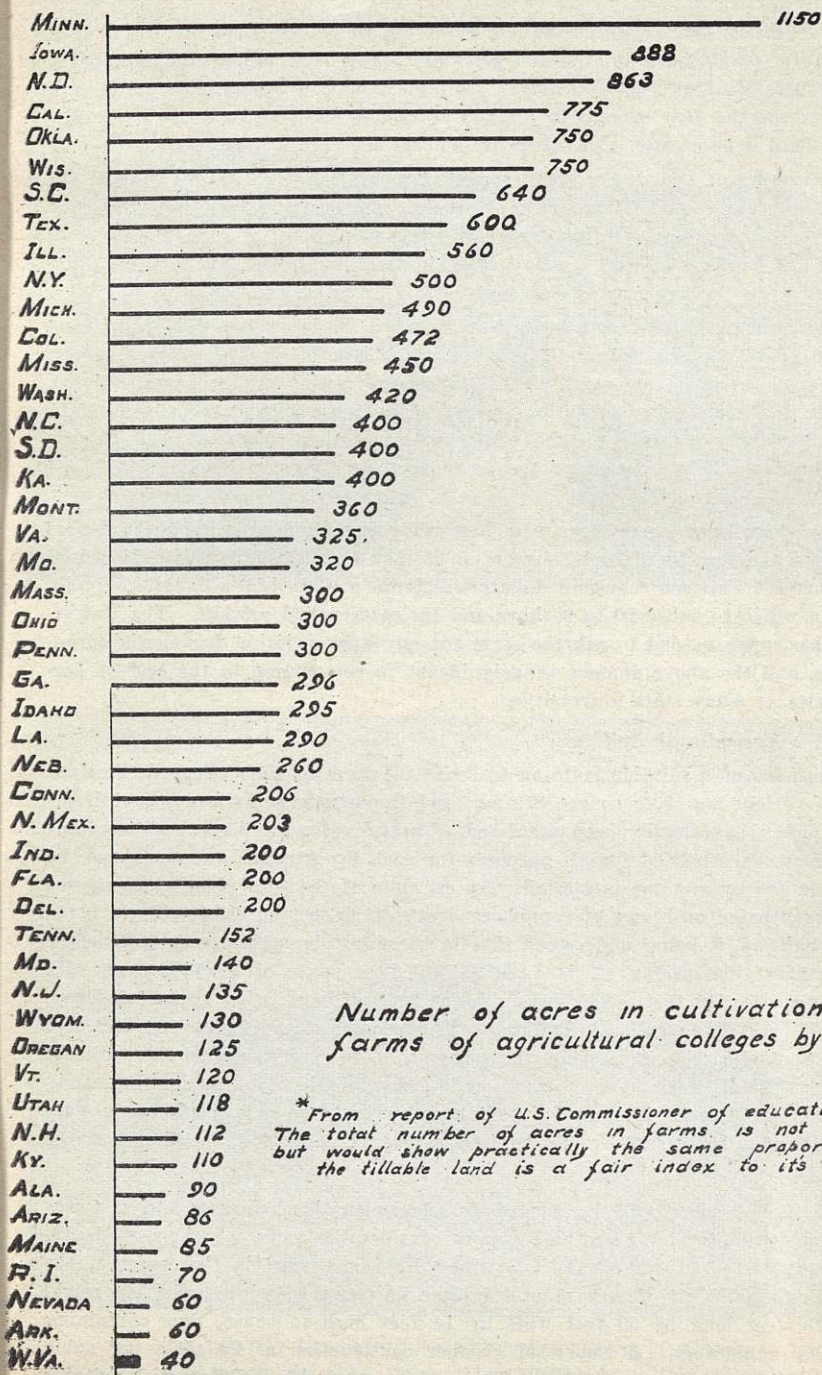
College of Agriculture.

I. Farm—

For additional land	\$30,000
For barns	15,000
Cattle barns	\$7,500
Sheep barn	2,000
Hog pens	500
Dairy house	1,500
Poultry house and relocation	3,000
Feeding shed	500
For fencing and roads	2,000

II. Dormitory for boys on farm

13,000



Number of acres in cultivation on farms of agricultural colleges by states.

** From report of U.S. Commissioner of education for 1911. The total number of acres in farms is not available, but would show practically the same proportions, as the tillable land is a fair index to its size.*

This diagram plainly shows that West Virginia is at the bottom of the list in the amount of cultivatable land which it furnishes its College of Agriculture. The College deserves better support, and the State is well able to be more liberal.

The present farm contains but 93 acres, of which less than 40 are tillable. The farm should have at least 150 acres of tillable land, which would probably mean a total of at least 250 acres. Suitable land can probably be purchased, but it must be near enough to the city to enable students to reach it readily. Such land is necessarily expensive, but will be more so in the future.

The report of the U. S. Commissioner of Education for 1911 shows that the 49 land grant colleges have farms averaging 333 acres of land under cultivation, and that West Virginia has the smallest amount of tillable land (40 acres) of any agricultural college farm in this country. This is graphically shown in the accompanying diagram.

The estimates for barns have been reduced to the lowest possible figure, and would enable the institution to build plain, substantial buildings, such as any successful farmer would erect. The total amount estimated for barns, \$15,000, is less than some state institutions are spending for one barn; thus, in 1910-11 the University of Idaho erected a dairy barn costing \$9,500, Cornell University built a \$20,000 barn, and the dairy barn of Clemson College, S. C., cost \$15,000.

The dormitory where boys can live while receiving training in practical work on the farm is absolutely essential, if they are to receive real agricultural education. Thirteen thousand dollars will build a plain but satisfactory building in which to house 20 to 25 boys and the matron and servant. The University has never needed to ask the state for any appropriation for men's dormitories, and the above amount is insignificant in comparison to the cost of dormitories at many state universities.

III. Agricultural Building.

The need of a suitable building to house the work of the College of Agriculture, Agricultural Experiment Station, and Departments of Botany and Home Economics, has already been described. Careful estimates have been made of the floor space needed for all purposes for each department, and these may be ascertained by any one interested. An estimate of the total floor space needed has been based on rooms of a uniform depth of 25 feet on either side of a ten foot hallway, it being understood that in the final plans the rooms will not be these exact dimensions. This gives a total floor space of 25x1200 feet, with basement 25x415 feet. This is equivalent to two floors, with 10 foot hallway, 300x60, and basement. A building with two floors and basement, 200 feet long and with a 50 foot wing at each end, all 60 feet wide, would probably give sufficient floor space. Such a building would contain approximately 720,000 cubic feet. Modern fireproof construction—the only kind that a state can afford to construct—would cost 25 cents per cubic foot, making the cost \$180,000.

Additional space will be needed for agricultural machinery and a stock-judging pavillion, both of which require considerable room. A one-story building constructed to connect the two wings, leaving a court in the center of the building, would give ample room for these purposes. Such an addition would be 200 feet long by 50 feet wide by 14 feet high to eaves, thus containing 140,000 cubic feet. A somewhat cheaper construction at 20 cents per cubic foot would make it cost \$28,000. The equipment of this building with suitable

Agricultural Building, State College, Pa.



AGRICULTURAL BUILDING, PENNSYLVANIA STATE COLLEGE.
Another View to Show that Our Neighbors Believe in Scientific Agriculture.



DAIRY BUILDING, PENNSYLVANIA STATE COLLEGE.
West Virginia's So-called Dairy Barn Would Be a Disgrace to Any Prosperous, Self-respecting Farmer.

shelving, desks, cases, furniture, etc., would require say \$17,000, making the total cost of the building and equipment \$225,000.

IV. Veterinary Clinic Building.

Plans have already been drawn by the architect of the Board of Control for a veterinary clinic building which he estimates would cost \$15,000. It is not feasible to have hospital stalls, operating and dissecting rooms in the main building, and such a building should be erected apart from it.

V. Greenhouses.

The three greenhouses now in use were erected nearly twenty years ago, and are not worth further repairs. They were built before the north end of the agricultural hall was erected, and it now shades them so badly that it is impossible to secure sufficient sunlight in winter. Five greenhouses should be erected. The central one should be 25x60, for potting and propagating, and should open into a small palm house 25x25. Two houses should open from these on each side. These four houses should be 25x100 feet, and would be used for lettuce, vegetables, roses and carnations, and for experimental work in plant physiology and pathology. Such houses, with a separate heating plant, which is necessary for their operation in fall and spring, would cost approximately \$15,000.

This would make a total cost of \$315,000 for agricultural buildings and land.

This may seem a large expenditure for this purpose; but the state has an obligation in this matter which it can not disregard. The University was founded by means of the congressional land grant of 1862, known as the Morrill Act, as an agricultural and mechanical college. This endowment was \$115,104.17 in 1910, and yielded \$6,485. The income from this endowment has undoubtedly amounted to over \$200,000. From 1890 to July 1, 1912, under acts of Congress approved August 30, 1890, and March 4, 1907, the University has received \$420,000 also appropriated for agricultural and mechanical education. Thus, the University has received over \$62000 from the federal government for education in agriculture and the mechanic arts and allied subjects. No accurate statistics are available, but it is a conservative estimate that up to July, 1910, not over \$50,000 of this amount had been spent for agricultural instruction or equipment. At that time (July, 1910), the total equipment of the College of Agriculture was not worth over \$500; it had no live stock, farm, gardens or greenhouses for purposes of instruction. It was housed in two rooms on the first floor, and three dark basement rooms of the oldest building on the campus. Up to this time, though the state has made as liberal provision for the University in engineering and liberal arts and sciences as its resources would permit and the growth of the institution necessitated, practically nothing has been done for agriculture, either in buildings or equipment, though agricultural education was the chief concern of Congress in making its appropriations, which form 23 per cent. of the total funds received by the University from the state and Federal governments.

On the other hand, it is interesting to note what other states have done for their agricultural colleges, and what has been the result. The accompanying maps show the value of buildings and lands of the agricultural colleges and experiment stations in Ohio, Pennsylvania and Virginia. It is well known that in each of these institutions the college of agriculture had but few students until it was provided with adequate buildings and equipment. The in-

crease in the number of students shown in the table on page 45, is co-incident, in almost every case, with the erection of new buildings and other enlargements of equipment, which made it possible to give adequate instruction. The table below gives a list of the buildings, land and equipment at several of the leading agricultural institutions. When the present agricultural equipment of West Virginia is compared with these institutions, it will be seen that a relatively large appropriation is absolutely necessary if we are in any degree to rectify conditions which have arisen through the continued neglect of this branch of education for which the institution was founded.

Value of buildings, equipment and land, and current state appropriations of the agricultural colleges and experiment stations of Ohio, Pennsylvania, Virginia and West Virginia.

NAME.	BUILDINGS.			LAND.			
	No	Value.	Current Appropriations.	Equipment.	Acres.	Value.	Current Appropriations.
Ohio State University, Columbus, O.....	6	\$202,500.00	\$10,000.00	\$50,086.00	300 115	\$300,000.00 leased	\$34,400.00 †40,000.00†
Ohio Agricultural Experiment Station, Wooster, O.....	7†	200,000.00	30,000.00		950	80,000.00	150,000.00 †50,000.00†
Pennsylvania State College, State College, Pa.....	5	300,000.00		40,000.00	850	85,000.00	90,000.00
**Pa. Agr. Exp. Station State College, Pa.....							
Virginia Polytechnic Institute, Blacksburg, Va.....	1	75,500.00	1,500.00	29,300.00	150 670	18,750.00 Leased	75,000.00††
**Norfolk Truck Station, Norfolk, Va.....							5,000.00
Virginia Agricultural Experiment Station, Blacksburg, Va.....	1	20,000.00					10,000.00 †5,000.00*
College of Agriculture, West Virginia University.....	½	10,000.00		8,000.00	93	10,000.00	15,000.00††
West Virginia Agricultural Experiment Station.....	1	15,000.00		12,000.00			4,000.00*
West Virginia.....	1½	25,000.00		20,000.00	93	10,000.00	

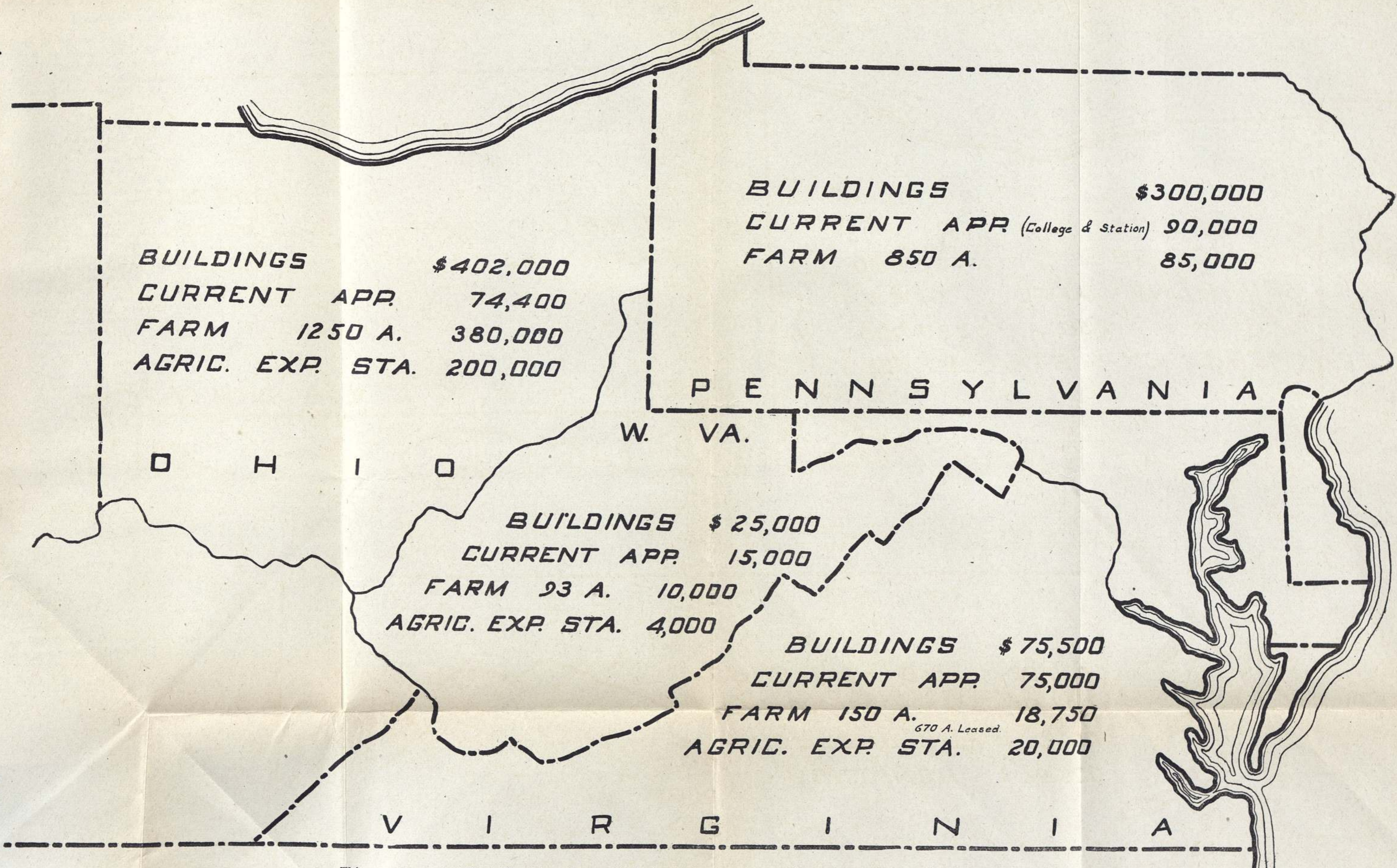
† Also 10 dwellings and 10 barns and small buildings.

* Indirectly.

† Extension work.

†† Part of general appropriation expended for College of Agriculture, salaries and equipment.

** No report.



This map shows what West Virginia and our neighboring states have invested in equipment for the scientific study of agriculture, and the current appropriation for this purpose. The map clearly shows that West Virginia has not been very liberal toward this important work.

Division of Agricultural Extension.

The work of the extension division and the great usefulness open to the University in an enlargement of this work have been explained above. The needs of this work have been carefully scrutinized, and we earnestly endorse the recommendations of President Hodges for an appropriation of \$25,000 for 1912-13 and \$35,000 for 1913-14. This recommendation is based on the following estimates:

	1912-13.	1913-14.
1. Agricultural extension schools for men, including additional salaries and expenses	\$ 2,500.00	\$ 5,000.00
2. Home economics schools for women, including salary of one instructor and expenses.....	1,500.00	2,500.00
3. Boys' and girls' agricultural clubs: half salary and expenses of man in charge, half salary and expense of woman (who will also assist in home economics schools), half of general expenses, including publications, seeds, office supplies, and clerical help (other half of this expense is borne by U. S. Department of Agricultur).....	3,000.00	3,500.00
4. Agricultural trains, including special exhibits, extra speakers and expenses	1,000.00	1,000.00
5. County fair educational exhibits, equipment, transportation, expenses and labor.....	1,500.00	2,000.00
6. Demonstration and farm visitation: pruning and spraying demonstration, demonstration orchards and truck gardens, demonstration work in dairying, co-operative experiments with fertilizers and farm crops, farm visitation and supervision....	2,500.00	3,000.00
7. Publications: "West Virginia School Agriculture," bulletin for boys' and girls' club work, special bulletins for answering correspondence, etc....	1,000.00	1,500.00
8. Agricultural editor to prepare and edit above publications and W. Va. Farm Improvement Page, News Notes, Farmers' Reading and Correspondence Courses, etc.	1,250.00	2,500.00
9. Assistant in agricultural education, to supervise and encourage agricultural instruction in rural schools	1,250.00	2,500.00
10. Office supplies, equipment, stationery, postage, traveling expenses, etc.	2,000.00	2,500.00
11. Salaries in whole or in part of those now employed in extension work, with addition of one assistant in soils and one in animal husbandry.....	7,490.00	10,000.00
	\$ 25,000.00	\$ 35,000.00

The estimates for 1913-14 do not provide for any enlargement of the work estimated for 1912-13, as those to be employed in the present fiscal year would be paid only for the part of the year subsequent to the appropriation and the expenses would be correspondingly less.

The last legislature appropriated \$5,000 per annum for horticultural extension work. As other branches of agricultural extension work were needed equally or more, the University arranged to carry on other extension work from its general funds. Thus, in the year ending September 30, 1912, the University expended approximately \$7,750 for extension work in addition to \$7,500 from the Horticultural Extension fund, making a total of over \$15,000. The work

done fully demonstrates the immediate necessity of a generous appropriation for this work. In the last quarter century the Federal government has expended millions of dollars in investigations for the benefit of the farmer. Although these have had a large influence upon the development of our agriculture, still the larger number of farmers are entirely ignorant of them and do their work in the same old way. It is high time, therefore, that, unless this large expenditure for his benefit be wasted, the results be so presented to the farmer that he will utilize them. This is the function of agricultural extension work, and it is now recognized throughout the country as one phase of the work of agricultural education on a parity with that of instruction of resident students by the college, and investigation and research by the Experiment Station.

That the estimate for this work is not excessive is shown by the table on page 63, which reveals that the average appropriation made by 38 states for agricultural extension work is over \$15,000 per annum, and that eight states are appropriating over \$30,000 per annum.

We have already recited instances of the value of the little work which has already been done in West Virginia. In other states, where such work has been carried on longer, the results have been most remarkable. Only a single example can here be cited. Mr. N. R. Baker, supervisor of rural schools of Alabama, writes us as follows concerning the work of their boys' and girls' clubs:

“As you may know, we have 11,000 boys enrolled in the corn club of this state, and, I believe, lead all other states in this corn club movement. If only 8,000 of these boys plant each an acre of corn and get an average of forty bushels to the acre, which is twenty bushels higher than the average for the state, but which is lower than the average of the corn club boys last year, you can readily see that these boys alone would increase the corn yield by 160,000 bushels this year. However, our boy who made the record of 224 bushels on one acre last year is confident at this time that he will get at least 500 bushels on a three-acre patch this year, and many other boys have planted more than the stipulated acre. In fact, it is estimated that the corn club movement will add one-half million bushels to the corn yield of Alabama this year, at the very least. We have fifteen counties organized for tomato club work this year. Last year we had but two. One of them was Walker county. In that county there are no large canneries, but each girl engaged in the tomato club movement, as a rule, invests in a small six-dollar to twenty-dollar canning outfit and learns to can not only her tomatoes but other things about home. As a consequence, while in 1910 the merchants of Walker county sold but 25,000 cans during the year, in 1911 they sold 50,000 cans and this year, or in 1912, to date they have sold 400,000 cans. One farmer in Pike county, nine miles from a railroad, has decided to put four acres in tomatoes this year instead of in cotton, as a result of the success of one girl who last year canned from one-tenth acre 1,023 two-pound cans of tomatoes.”

Surely, if similar results can be secured in West Virginia, which the small beginning already made fully promises, no appropriation could yield greater returns.

Summary showing the appropriations for agricultural extension work in each state.*

STATE.	Total Expended		Appropriation
	1910-11	1911-12	1911-12
Alabama	\$	\$	\$ 5,000.00
Arkansas	4,000.00	5,000.00	4,000.00
California	10,000.00	10,000.00	15,000.00
Colorado	5,000.00	5,000.00	5,000.00
Connecticut			5,000.00
Delaware	4,500.00		5,000.00
Florida	7,500.00	9,000.00	8,000.00
Georgia	12,500.00	18,470.58	30,000.00
Hawaii			
Idaho	2,500.00	2,500.00	12,000.00
Illinois	10,700.00	10,700.00	19,900.00
Indiana	20,000.00	20,000.00	49,200.00
Iowa	32,000.00	35,000.00	50,000.00
Kansas	27,500.00	27,500.00	35,000.00
Kentucky		600.00	
Louisiana	6,000.00	5,000.00	6,000.00
Maine	1,000.00	1,000.00	1,900.00
(f) Maryland	6,000.00	6,000.00	6,000.00
Massachusetts	15,000.00	15,000.00	20,000.00
Michigan	10,230.00	10,230.00	10,230.00
Minnesota	25,000.00	31,000.00	42,000.00
Missouri	26,000.00	27,500.00	
Montana		1,000.00	
Nebraska	10,000.00	14,000.00	17,500.00
Nevada			
New Hampshire			3,250.00
New Jersey			
New Mexico			600.00
New York	12,000.00	12,000.00	50,000.00
North Carolina		400.00	
North Dakota		5,000.00	5,000.00
Ohio	50,000.00	50,000.00	40,000.00
Oklahoma	7,500.00	7,500.00	9,375.00
Oregon	2,500.00	2,500.00	2,500.00
Pennsylvania	13,400.00	12,100.00	10,866.00
Rhode Island	2,200.00	2,130.86	3,200.00
South Carolina	10,243.42	11,197.27	15,700.00
(f) South Dakota	10,000.00	10,000.00	13,000.00
Tennessee			
Texas	3,100.00	4,000.00	10,000.00
Utah	5,000.00	5,000.00	10,000.00
Vermont			
Virginia (Poly.)	2,500.00	2,500.00	2,500.00
Virginia (Hampton)	700.00	1,100.00	1,950.00
Washington	8,000.00	8,000.00	10,000.00
West Virginia	5,000.00	9,000.00	5,000.00
Wisconsin	30,000.00	30,000.00	40,000.00
Wyoming			
Total	\$397,573.42	\$427,628.71	\$584,171.00

*Prepared by John Hamilton, Farmers' Institute Specialist, U. S. Department of Agriculture.

Special Equipment Needed for Secondary and Elementary Schools.

For Normal Schools.

Some well-meaning persons are inclined to argue that we have too many normal schools in West Virginia. Educators are agreed that an attendance of about 250 can be handled to best advantage in a normal school, and since each of our normal schools has reached this attendance, there is every reason to believe that our state normal schools are well located and that all of them are needed to answer our demands. For that reason we do not hesitate to urge generous expenditures for permanent improvement in each.

Our ideals are formed for the most part by our environment. The teachers during their training period should be under the influence of normal schools which are beautiful, modern, and thoroughly equipped. From the standpoint of agriculture and domestic science each normal school needs the following:

- (1). Buildings of modern type,—beautiful and convenient.
- (2). Several acres of good farm land where simple demonstrations in agriculture and school gardens can be made.
- (3). Model rural schools equipped and managed by the normal school. This school should be in an outlying rural district with average rural environment.
- (4). Some of our normals should have a small model rural home, equipped in keeping with average rural environment. The teacher of agriculture and domestic science should be responsible for the management of this home.
- (5). First class laboratories for the study of the sciences, especially biology and agriculture. In such laboratories there should be a representative supply of modern farm implements.
- (6). Thoroughly equipped rooms for domestic science and domestic art. Each normal school should have an immediate appropriation of \$800 to \$1,500 for such a department.

For Our Preparatory Schools.

Fortunately our two university preparatory schools are located in widely differing communities which represent the extremes of conditions in West Virginia. The Keyser Preparatory School is in the midst of a fine farming section, where fruit growing is being much emphasized. The Montgomery Preparatory School is situated in the midst of a mountainous mining region where the problems are entirely different. Therefore we suggest the following as the proper equipment of each:

(1). Keyser Preparatory School—

(a). Farm of 20 or 25 acres of good land suited to truck farming and a model orchard.

(b). Thoroughly equipped department of domestic science and domestic art costing \$1,000 to \$1,500.

(c). Well equipped laboratories for teaching of biology and agriculture.

(2). Montgomery Preparatory School—

(a). Manual training and carpentry shops with modern equipment.

(b). Equipment for teaching the elementary subjects of mining.

(c). Laboratories in which special emphasis can be put upon chemistry.

(d). Thoroughly equipped departments of domestic science and domestic art costing from \$1,000 to \$1,500.

For the Colored Institutes.

Most of the needs of these institutes have been referred to in Part One of this report, under proper headings. The equipment needed to make these schools more useful to the colored people living in small villages and rural districts is indicated here in order to make the general outline of this special report complete.

The Institute at Bluefield should continue to offer strong normal and domestic science courses and should add work in mechanical and mining industries and some opportunities for special instruction in poultry raising and truck gardening.

The institution at Institute should strengthen the present work in the normal, domestic science and mechanical departments and place special emphasis upon agriculture.

With these objects in view these institutions should have the following equipment:

1. Bluefield Colored Institute.—

(a). An entirely new location and plant where scientific truck gardening and poultry raising can be carried on successfully.

(b). Well equipped shops where special industrial courses can be offered. These shops should have some equipment for giving instruction in the elementary principles of mining.

(c). Modern equipment for domestic science and art should be added with a view to giving the colored girls better ideals as to quality and fitness of household and kitchen furniture.

(d). In the near future provision should be made for sending out from this school a member of the faculty to do extension work in home keeping among the colored people of the mining towns and rural districts of that part of the state.

2. West Virginia Colored Institute.—

(a). More land. At the present time considerable land adjoining

the property of this school can be secured at a very reasonable price. The extension of the present small farm should be made before prices advance again as the present farm is not sufficient in size to offer instruction in experimental work to the growing numbers of students who are coming to this school for instruction. The farm should be drained.

(b). A dairy barn which will cost three or four thousand dollars.

(c). A herd of good cows and some other high-grade farm animals. At the present time the institution has some low-grade cows that do not furnish enough milk and butter for the dormitory of the school. The institute should be made respectable in this important branch of farming at an early date.

(d). Laboratories in keeping with the importance of the sciences taught in them should be provided as soon as possible.

For High Schools.

New high schools are being established in West Virginia at a remarkable rate. Fortunately the authorities are providing large, substantial high school buildings. The idea that a high school is well provided for as soon as a new building is erected is entirely too prevalent. If the seventy-five rural high schools in West Virginia are to become centers from which will go out real concrete assistance to the families of the farmers, they must have some special equipment for extending this helpful influence to their students and patrons. The discussion of this topic does not properly belong to this report, but we venture to suggest the following special needs for a large number of our high schools:

1. Laboratories and Museums.

If the rural high school boys and girls are to maintain and increase their natural interest in rural life they must be brought into more intelligent contact with the common things about them, and must be shown the beauty and the mystery of many things beyond ordinary notice. This kind of work requires first class chemical and physical laboratories and the full equipment of microscopes and other materials to aid in the study of such subjects as biology and general agriculture. In addition to these laboratories our high schools should make provision for the collection and classification of material of unusual interest or value. If our boys and girls are herded in bare, empty high school rooms and treated to instruction taken mostly from books intended to prepare students for college and the professions, we cannot hope to make them very enthusiastic about the opportunities of the farm.

2. Domestic Science and Manual Training.

It is true that our city high schools are giving more attention to the study of housekeeping and the manual arts than our village and rural schools are. There is some indication that our smaller high

schools are copying after the type of high school that prevailed in the city many years ago and have failed to catch the full spirit of the modern high school. As it is many of our girls and boys go to the high school with the idea of finding some escape from manual labor when they ought to go to find some way of applying the power of an educated brain through a trained hand. If necessary, the state should give local communities some special assistance in domestic science and manual training equipment.

3. *More land.*

If the rural high school comes to stay in the country, it must be provided with enough land to make it feel at home. The high school is intended to set high ideals. For this reason it should have about it roomy, well-kept lawns, ample play grounds and enough other land for simple experiments and demonstrations in agriculture. As stated before a small appropriation to supplement the efforts of local communities in equipping high schools for special agricultural work would do much to encourage the purchase of adequate land and other equipment.

For Elementary Schools.

If we consider facts as they really are, we are forced to conclude that most of the information and ideals which are carried to the masses of the coming generations must go through the channel of the public elementary schools, as only five to ten per cent of our boys and girls ever get beyond that school. These two hundred thousand rural children deserve much better accommodations in the only school which they will ever be fortunate enough to attend. Too often the rural school house and equipment appear like apologies for the smallness and poverty of rural life. Aside from its value for purposes of instruction, the rural school house and equipment should reflect the stability and beauty of the country. Most of our rural elementary schools need:

1. *Home-like houses.*

The school houses in the slope of the roof, in the shape and position of the windows, in the placing and style of the neat porches, in the well-kept broad lawns should present models of rural architecture and stand as perpetual advocates of beautiful rural homes.

2. *Inside Equipment.*

The children who come to the rural school need very much, lessons in sanitation and common home niceties. These cannot be taught if the water is kept in a dirty, open bucket which sits beneath the broom and dust rag, and if the children's clothing must be piled on top of their dinner pails. In order to carry the right lessons in these matters to the country boys and girls, the rural school should have good cloak rooms, a small room for materials, closed water jars and ample shelves and cases for keeping all materials in appropriate places. Furthermore, the rural school should by all means have a small neat room for industrial work such as manual training and simple lessons in cooking and sewing. These things with an abundance of good

books and appropriate pictures will do very much to stop the need of the cry "back to the farm." Why not devise some way to place these fine influences where they will affect the great body of our citizenship?

3. *More land.*

All our public institutions from the University to the one-room rural school are asking for more land, and the next generation will no doubt wonder why we of this time did not secure land when it was to be had at reasonable prices. The rural children will not be able to do much gardening or farming at school but they should be taught how to provide in winter for attractive surroundings in summer and in many cases ought to have public ground to start school garden enterprises which can be supervised in summer by farm demonstrators, district superintendents or special organizations of the boys and girls. Any legislation or movement which will secure more land for the rural schools will be serving an immediate need and a future demand.

WILL SUCH A CAMPAIGN FOR BETTER AGRICULTURE SUCCEED?— PROOF.

Every man in touch with the thought of the day is aware that the whole citizenship of these United States, West Virginia not excepted, is thoroughly aroused to the absolute necessity of better agricultural practices upon the part of our farmers. In all parts of the country all sorts of organizations are seeking to discover the most effective and economic methods for bringing this about.

“That which has come upon this country with such suddenness was felt by older nations years ago, and efforts were then begun to provide for the future food requirements of their growing populations before these populations would have overtaken production and their people be face to face with insufficient means for self-support. In endeavoring to solve the problems that land impoverishment had brought upon them various experiments were tried by different counties with various degrees of success.

“An examination of the present condition of agriculture in European countries, compared with that when attention to better farming first began, shows that there has been great advance and that the limit of production has not yet been reached. The results that have been accomplished in one of the smallest countries of Europe—Belgium—and the methods that were employed in effecting her remarkable advance have been set forth in detail in a recent publication (*L’Agriculture Belge de 1885 a 1910. Monographies publiees a l’occasion due XXV anniversaire de l’institution du service des agronomes de l’etat. Louvain, Imprimerie Fernand Giele, rue de la Station 15, 1910*) by the minister of agriculture of that country, giving the methods employed in each province, and the rise in price of agricultural lands, and increase in their productive power during the last 25 years.’”*

Results in Belgium as Proof.

Belgium has an area slightly less than one-half of West Virginia. Prior to 1885, the agriculture of the country was in a much neglected condition, at which time a method of improvement was adopted that has produced remarkable results. The office of extension supervisors was created by royal edict-September 26, 1885. The supervisors have for their principal mission the popularization in a practical manner of the knowledge and processes of agricultural science. They put themselves in direct contact with the cultivators and give them gratuitously the counsel desired. They perform the functions of nomadic (or itinerant) agricultural lecturers in the territory, and organize annual conferences in at least five districts throughout each section. The supervisors are further charged with organizing demonstration or experimental fields in order to give practical instruction to the farmers.

In short, these extension supervisors did in Belgium much the same type of work that the county agricultural demonstrators or farm management demonstrators are commencing in this country. The work was organized with nine supervisors in six divisions, but the number has been increased until there are

*Quoted from Report of the Office of Experiment Stations, U. S. Department of Agriculture for 1910, page 425—“The Results of Agricultural Extension in Belgium.” Translated and summarized by J. M. Steadman from the original.

now thirty-four extension supervisors and numerous assistants. The results of the twenty-five years' work supported by the Belgium government has been most remarkable, and can be but briefly indicated in the following table.

	1885	1910
Wheat, bushels per acre	24.54	38.55
Rye, bushels per acre	23.86	36.69
Oats, bushels per acre	49.75	81.48
Barley (winter) bushels per acre.....	38.25	57.57
	1880	1907
Cattle	1,382,815	1,817,687
Hogs	646,375	1,379,462

Value of farm lands in provinces of Belgium:

Province	Value per acre in 1885.	Value per acre in 1910.
Anvers	\$105.00	\$162.00
Brabant, sandy land	160.00	225.00
Brabant, sandy clay	280.00	340.00
West Flanders	243.00	405.00
Luxemburg (arable)	120.00 (1880)	162.00
Luxemburg (prairie)	189.00 (1880)	202.00

In this period the home surroundings of the farmers were also greatly improved, the quality of the live stock was much bettered, and a great industry has arisen in market garden products and in floriculture. These extension supervisors have worked a complete revolution in the agriculture of Belgium, so that it is now one of the most prosperous agricultural countries.

Results in Denmark as Proof.

Another classical example of agricultural development which has commanded the admiration and study of the civilized world is that of Denmark. It is a small country, with about two-thirds (9,830,400 acres) the area of West Virginia (15, 374,080 acres), but with nearly double its population (W. Va. 1, 221,119, Denmark 2,590,000). Denmark has a relatively poor, thin, soil, and is a low country between two cold bodies of water, thus giving it a long, hard winter and a short growing season. A century ago its people were among the poorest in Europe; today, their per capita wealth exceeds that of any other country of continental Europe. In 1866 the total agricultural exports amounted to only \$3,750,000, while in 1908 they had risen to \$104,000,000*.

This rapid development is more readily appreciated from the following table, in which the average exports for five-year periods are given except for 1908:

*Except for the year 1908 the average for a five-year period is given:

	Av. Exp. 1875-1879	Av. 1895-1899	Exp. for 1908
Horses	\$ 1,750,000	\$ 2,909,000	\$ 3,000,000
Cattle	5,250,000	3,000,000	7,000,000
Bacon and lard	750,000	12,000,000	26,500,000
Butter	6,500,000	30,000,000	45,750,000
Eggs	250,000	3,000,000	6,600,000
Totals	\$14,500,000	\$50,909,000	\$88,850,000

*From "Rural Denmark and Its Lessons," H. Rider Haggard, London, 1911, p. 175.

“The total export trade is approximately \$380 for every farm, of which 133,000 of the 250,000 are of less than 13 1-2 acres in extent and have an average size of but 3.6 acres, the average of all the farms being but 43 acres for the entire country’’. **

“The reasons for their success may be roughly classified as follows:

- (1) The extensive use of expert advice.
- (2). The granting of aid by the state when the people have undertaken some worthy enterprise for themselves.
- (3) Thorough systems of testing market products and educating the producers.
- (4) The wonderful development of cooperative organizations, and the prevalence of the cooperative spirit.
- (5) The development among the Danes of a high degree of popular intelligence, a fine national spirit, and a social morality.’’ *

The two most important factors in Denmark’s agricultural renaissance have been *education* and *cooperation*. Agricultural education has been aided by the government for both old and young, not only through institutions but through extension agencies and expert advisers in a manner to best meet the needs of all classes of its husbandmen. Cooperation has also been fostered by the government. The extent to which cooperation has been carried is indicated by there being 1157 cooperative dairies with 157,000 farmer members, the 52,000 members in the Danish Cooperative Egg Export Society, and 95,000 members in 34 bacon-curing societies.

The Danish farmers cooperate in every possible way, in purchasing their supplies, in their banking, in breeding their stock and in selling their products. They are undoubtedly the best organized body of farmers in any country. As a result, they are able to take care of their own interests in the markets of the world.

“Some years ago there was formed in London a trust to control the bacon industry. It fixed the price to the farmers and the price to the consumer as well. This spelled disaster to the Danish farmer. But he met this danger as he had his former difficulties by cooperation. He formed a selling agency of his own. The Danish Bacon Co. of London not only destroyed the trust; it insured to the Danish farmer a secure market for his produce. Thus the farmer gets all that his labor produces. He is not despoiled by warehousemen, by railway or other monopoly charges.’’ †

As a result of this agricultural development, emigration from Denmark has practically ceased since 1881, the city population has practically doubled, and the rural population has increased ten per cent. When we consider Denmark’s situation as to climate and soil, that it has 174 inhabitants per square mile, and that it is almost wholly an agricultural country, exporting the greater part of its product to the amount of \$100,000,000 per annum, and compare it with West Virginia with less than one-third (51 per square mile) its density of

**Table and quotation from “A Commonwealth Ruled by Farmers, Frederick Howe, The Outlook, Vol. 94, p. 441.

*From “How Cooperation has Enriched Denmark, Selden Smyser, The World’s Work, Vol. 19, p. 12,285.

†Quoted from F. C. Howe, 1. c.

population, with favorable climate, responsive soil, and which with the best of local markets imports \$50,000,000 of agricultural products, it would seem that we might learn from Denmark's experience.

Results in Southern States as Proof.

In our own country there are many counties and small sections which have made rapid development in better agriculture and better country life, but no one section shows so remarkable a change as has taken place in the great Southland from Texas to Virginia. Probably no one agency has been more influential in improving the agriculture of the South than the Farmers' Co-operative Movement, though the State Universities, Agricultural Colleges and Experiment Stations, the State Commissioners and Boards of Agriculture, and the State Departments of Public Instruction have done marvels, and there has been the finest co-operation between all of these agencies. Attention is called to the Farmers' Cooperative Demonstration Work of the United States Department of Agriculture because it was originated to meet unusual conditions and has demonstrated the value of a new method of agricultural education by the very remarkable results achieved.

In 1902 the Mexican Cotton Boll Weevil appeared in central Texas and practically destroyed the crop over large areas. Cotton was the money crop of both large and small planters, who at that time did not grow enough feed for their own stock and depended upon cotton for their income. As the destruction of the crop became more and more apparent, tenants abandoned their crops, owners became disheartened, merchants were unable to collect their accounts, and the banks feared a local financial panic. The business situation was critical, due to the credit system long in vogue and upon which the whole superstructure of business rested. The entomologists had already studied the insect for several years and had shown how cotton might be grown in spite of it, but this involved a revolution in the old way of raising cotton, and the planters were dubious of its feasibility and wanted a "remedy" which would destroy the pest. Such a remedy, that is some practical treatment which would destroy the insect, was soon found to be impracticable, though it had been demonstrated that profitable crops could be grown by the new methods. At this juncture the Bureau of Plant Industry of the United States Department of Agriculture appointed Dr. Seaman A. Knapp to show the people how they could grow cotton in spite of the weevil. Dr. Knapp had already been the leading influence in establishing the rice industry in Louisiana and through years of experience in agricultural work had learned how to reach the farmer. Dr. Knapp appreciated that the farmer must be persuaded to try better methods and to demonstrate to his own satisfaction on his own land that they are profitable. To this end he appointed a successful, progressive farmer as county agent in each county. These county agents visited the farmers and secured a certain number who agreed to plant a small area of their crop according to the methods advised by the U. S. Department of Agriculture. These were known as "demonstrators," and their work was given careful and frequent supervision by the county agents. Other farmers were encouraged to try the same methods but were visited only once or twice during the season; these were known as "cooperators." The methods used were very simple. Most of the cotton grown was of large, rank-growing, late-bearing sorts which were most

susceptible to injury by the weevil. Dr. Knapp's agents introduced improved seed of varieties which matured early and bore more cotton. They insisted upon deep plowing, thorough preparation of the seed bed, early planting, thorough cultivation, and wide rows, which resulted in the production of an early crop before the weevils were numerous enough to destroy it. The benefits of this system were soon apparent to the "demonstrators" and to their neighbors, and the work grew rapidly. It succeeded because of the simplicity of the plan and because the "demonstrator" or "cooperator" could not but be convinced of his own results. Another feature of the work was to encourage the diversification of crops so that the planters would not be dependent upon cotton, and so that they would grow enough feed for their own stock and might increase the amount of stock raised and thus build up the fertility of their lands. In many of the most fertile river bottoms planters were importing their corn from more northern states, though they had the best land in the world for its production, and with a failure of cotton they were unable to buy it. Thus Dr. Knapp sought to make them real farmers rather than mere planters.

As the weevil advanced eastward the demonstration work preceded it, so as to prepare the farmers to meet its depredations. So successful was the work that the legislatures of several southern states made appropriations for aiding in its support in cooperation with their state agricultural colleges, large amounts were subscribed for its support by bankers and business men and organizations of all kinds, and finally the General Education Board made a large appropriation for the work in states which had not been reached by the boll weevil, in which the congressional appropriation was not available. This appropriation of the General Education Board has been increased each year since then. With the demonstration work for farmers grew up the boys' corn clubs and the tomato canning clubs for girls, which are now organized throughout the South and have had a powerful influence in arousing the interest of the parents in the possibilities of better and more diversified farming.

The results of this whole movement, which it is impossible to adequately describe, briefly, are most phenomenal. "Before long the planters of Louisiana, Texas and Arkansas, where the boll weevil existed, not only 'made' cotton but began to raise corn and vegetables and hogs and chickens and cattle. In 1904 at one little railway station in Texas there was shipped one carload of hogs; in 1905, through the influence of Dr. Knapp's teaching they shipped twenty-seven carloads of hogs. In Louisiana three years ago (1908) the farmers were buying corn. Last year (1910), in addition to supplying the corn needed at home, they were able to sell 50,000,000 bushels on the open market." *

In 1900 the southern states produced approximately one-fifth of the corn of the United States; in 1910 they produced one-third of it. "In 1910, in ten southern states, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Arkansas, Louisiana, and Texas, they produced 158,000,000 bushels of corn more than they produced in the year 1909, or 45 per cent. of the total increase of the United States. The state of Mississippi increased its corn crop 60 per cent, or from 40,000,000 bushels to 63,000,000 bushels. In the state of Mississippi the average production for ten years previous to

*Dr. Wallace Buttrick, in *Review of Reviews*, Vol. 43, p. 684.

five years ago was approximately 13 bushels per acre, and in 1910 it was 20 1-2 bushels per acre. I was told by a merchant in Lincoln county, Mississippi, that in the three years before it had been customary for his firm to send \$300,000 in money into Missouri, Kansas, and other states in the North, to get corn to advance to the cotton planters to grow their crops, and that in the year 1910 he did not spend a single cent for that purpose." *

"Not being investigational in character, it is at once apparent that the results of this work can not be easily tabulated, nor do they adapt themselves readily to presentation in the form of mere statistics of results obtained. The simple statement that a thousand farmers in a particular state under the direction of the department produced an average yield per acre of the standard crops of twice or three times the ordinary yield conveys information of but a small part of the actual effect of the fact stated. The arousing of an interest in agriculture, the creating and increasing of a desire for information, and the rapid acquisition of knowledge through participation in demonstrations are matters which can not be subjected to tabulation. Nevertheless, the results of this work have been so far-reaching in character that they deserve mention. Without attempting to reduce them to the form of scientific information, an attempt will be made to detail some of the results accomplished in the seven years that this work has been carried on."

"As tending to show the success of the methods advocated by the Department of Agriculture for the raising of standard crops of corn and cotton in the South, the table below is presented, showing the production of these crops in the Southern states during the seasons of 1909 and 1910. The figures contained in this table show the average of demonstration farms from which accurate returns were received. All demonstrators are asked to make reports and they are collected by agents, but it is impossible to obtain accurate data from all farmers instructed. Many have no means of weighing or measuring, while others gather their crops without keeping any record unless the agent is present. Data were collected from about 12,000 demonstrators, representing an acreage in cotton of about 85,000 acres and in corn of about 75,000 acres. * * * In this connection it should be stated that the total number of farmers instructed during the season of 1911 was 89,764, of whom 26,227 were classed as demonstrators, whose crops were visited at least once every 30 days by an agent of the departments, and 63,537 as cooperators, whose farms were visited only occasionally or not at all, but only consulted the agent personally and received printed instructions.

*From address of Dr. Bradford Knapp before the First Annual Conference of the Bankers Committees on Agricultural Development and Education, Minneapolis, 1911, p. 53.

INCREASED AVERAGE YIELD OF COTTON AND CORN ON DEMONSTRATION
FARMS OVER THE AVERAGE YIELD IN SEVERAL SOUTHERN STATES
IN 1909 AND 1910.*

STATES	Average yield of seed cotton per acre.				Average yield of seed corn per acre.			
	Demonstrators		Entire state		Demonstrators		Entire state.	
	1909	1910	1909	1910	1909	1910	1909	1910
	Lbs.	Lbs.	Lbs.	Lbs.	Bu.	Bu.	Bu.	Bu.
Eastern Texas	690.6	826.1			28.4	34.1		
Western Texas	547.5	578.4			21.8	31.5		
Texas, entire state....	633.3	710.4	375	435	25.4	32.8	14.7	20.6
Oklahoma	527.7	708.1	441	600	26.0	24.1	15.9	16.0
Louisiana	757.8	785.5	390	360	30.8	35.2	16.3	23.6
Arkansas	844.6	915.3	459	525	30.6	36.8	16.5	24.0
Mississippi	1,115.7	933.5	471	546	36.9	41.6	13.1	20.5
Alabama	1,138.4	1,220.2	426	480	33.2	41.4	11.9	18.0
Florida	597.5	572.0	330	330	21.0	23.0	11.3	13.0
Georgia	1,303.9	1,298.0	552	519	34.4	35.4	11.6	14.5
South Carolina	1,204.9	1,294.3	630	648	36.1	41.0	13.3	18.5
North Carolina	1,238.2	1,332.7	630	681	40.0	43.4	13.9	18.6
Virginia					41.0	46.5	20.6	25.5

The results of this campaign for better agriculture conducted throughout the South during the past decade are most apparent in the territory in which it was first inaugurated but are already manifest in the territory where it has been but recently started. The Farmers' Cooperative Demonstration Work has been but one part of this work; for the agricultural colleges and experimenter stations, the farmers' institutes, the rural schools, and every agency which could aid in promoting better farming has done its share in the general campaign. We have called special attention to the Farmers' Cooperative Demonstration Work because it is the only widespread systematic effort at the general education of the people on the farms with which we are acquainted in this country, and it has been so successful as to form the basis for planting similar work throughout the whole country. Unfortunately, though usually classed as a southern state, West Virginia is outside of the cotton belt, and has not therefore caught the inspiration for a rejuvenated agriculture and a better and fuller country life which has swept through the South. We are now awake to the situation and its needs. Will we profit by the experience of our sister states and liberally support those methods of work which are so rapidly making a New South?

*From Year Book 1911, U. S. Dept. Agr., pp. 287, 189, 290, "Some Results of the Farmers' Cooperative Demonstration Work," by Bradford Knapp.

