

State Normal School of Colorado



AGRICULTURE AND NATURE STUDY FOR RURAL SCHOOLS

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BY H. W. HOCHBAUM

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FOREWORD.

The introduction of agriculture as a special department in normal schools marks a step in the history of education that has great significance, for it is the beginning of a more rational, efficient system that will soon be followed in every school in the country—one that aims to train the child for life by teaching him in terms of life, by fitting him for life. Agricultural education may be a phase of so-called industrial education, but it is also more than that, in that it aims at more than instruction in vocation. Besides teaching the business of the country, farming, this new education should deal with all the life and affairs of the country. One can see that this means more than the mere addition of another subject, more than the giving of technical information in agriculture. Country life and rural affairs should be the spirit of every school, around which should center the teaching of all the subjects of the school. It is more than a subject; it is a point of view, one that is bound to revolutionize teaching methods. Professor L. H. Bailey of Cornell University, Chairman of the Country Life Commission appointed by Ex-President Roosevelt, has written a splendid book on the whole problem of country life and education. This book, *The State and the Farmer*, (The Macmillan Co.) should be in the hands of every country school teacher, supervisor, and patron. I have taken the liberty to quote freely from it.

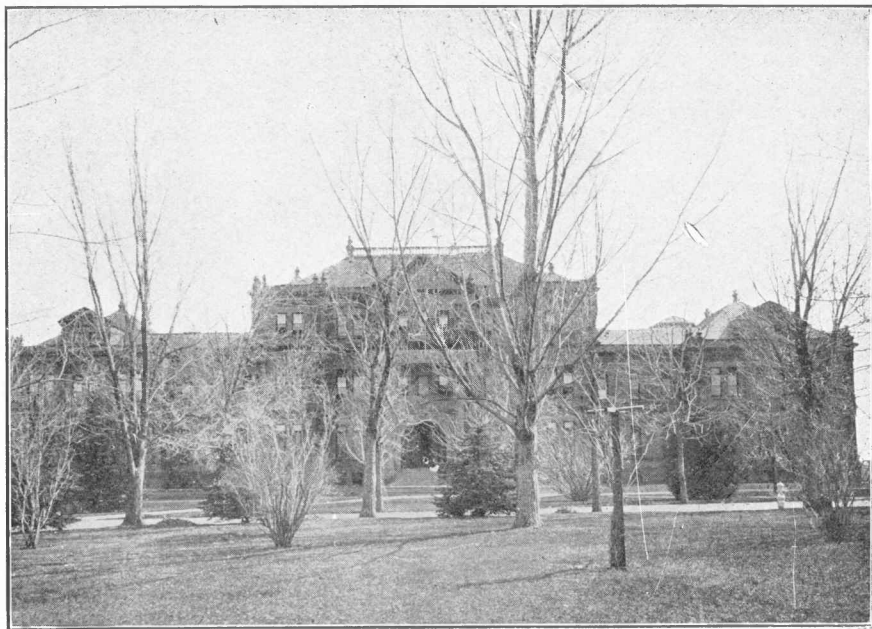
H. W. HOCHBAUM,

Dep't. of Agricultural Education.

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Administration Building.



Excursion to a Weld County Farm.
Harvesting Potatoes.



Eighth Grade Farm.
Potato Field.

Why Rural Schools are Inefficient.

“The country schools which train nearly one-half of the school population of the country, so far as school training goes, should definitely recognize the fact that the major portion of those being trained will continue to live upon the farm; and that there should be specific definite technical training fitting them for the activities of farm life. Such schools will not make farmers or housekeepers, but they will interest the boys and girls in farming and housekeeping and the problems connected with these two important vocations.” Committee on Industrial Education for Country Communities, National Education Association Report for 1905.

“Education is not confined to the institutions known as schools. It is the result of all experience and training. Many other agencies are contributing directly to this training, or are modifying its application. Some day the school will utilize and direct the experience that the child gains in the home life, as well as in the school life, towards a distinct educational end.” L. H. Bailey, *The State and the Farmer*, The Macmillan Co.

It is a maxim in education that education should grow out of the lives of the people and back into their lives. This maxim is as yet but little heeded, for most of our teaching has little to do with the people and is entirely unrelated to their lives. Thus, the home life of

the child, his daily activities outside of the school, the affairs of the community have no part in the school life. The child lives in one world and goes to school in another. Here little attention is paid to teaching in terms of the environment, life, and occupations of country people. The children of the country grow up in ignorance of the common things around them, of the influences which may shape the affairs of the country. Unless the home influences stimulate children to be interested in nature; the fields, woods, and roadsides are to them a sealed book. Of agriculture, the great business of the country, the work the majority of them will follow, they learn nothing except what is picked up at home; and since this information is too often affected by the discontent and disappointments of country people, because it may be faulty, or even untrue, their knowledge of agriculture is correspondingly faulty.

It would seem that if one were asked to establish an educational system in a new country, that he would embrace in this system something of the lives and activities of the people, something of their environment, their work, their customs, and the thousand and one influences affecting their lives. Instead, however, in the development of our educational systems here, of following such institutions, we slavishly adhere to a rigid, cut-and-dried system in which the life of a people plays little part. The common subjects of the school curriculum, the three R's, are the idols of our worship, and how blindly we kneel down, mistaking the means to an end for the end. In our search for "culture", the pot of gold at the end of the rainbow, we do not see the golden treasures under our feet and everywhere around us. Prof.

L. H. Bailey, tersely sums up the situation in the following paragraph: (*The State and the Farmer*, L. H. Bailey—The Macmillan Co.)

“The old schools were built on the four R’s, reading, ’riting, ’rithmetic, and the ruler. They were a combination of certain formal subjects and what is called good discipline. There are still those who hold that the pursuit of reading, ’riting, and ’rithmetic is of itself an end in education. These subjects, however, are but a means to be used in the acquiring of knowledge and power. Of course, the pursuit of them is an educational process, but the basis of education is at first to develop the child by means of the activities and of the things that make up his world; he needs reading, ’riting, and ’rithmetic to enable him to make use of his world and to understand it.”

To-day we hear much of discontent with country life and farming. I sometimes think that this is greatly exaggerated by writers who write from the experience of the study, rather than from actual knowledge and insight; but taking the statement for granted, how can we expect sympathy, interest, and content in the country and all its affairs, unless we teach in terms of these things, in terms of the country and its affairs? How much do we consider the many influences which have shaped the affairs of a community, its settlement, changes, life, occupations, and industry, in the training of the children who tomorrow will be citizens of that community? How little we really try to extend their sympathies and interests in these directions! How little must we expect then of sympathy, interest and content!

To make matters worse, the teacher, the one person

who could exert the greatest influence in turning the interests and sympathies of the children countryward may, consciously or unconsciously, exert a reverse influence. Often she lacks sympathy with the country, and thus, can hardly be expected to broaden the sympathies of her charges in that direction. In her training, her education, her thoughts, this has never entered, has never been considered. She may be too much a slave to method, subject matter, and discipline. Often she is city bred, and the country school is only a temporary factor, the country only a temporary abode. Thinking and living in terms of the city, to which she returns at the end of the school year, and for every vacation, she influences her children towards the city, of whose attractions she may tell them so much, and of whose disadvantages she tells them so little. With her she brings city methods and city ideals, which still further lead the children astray. One criticism that is made of the consolidation of schools is that these may bring into the country schools city teachers with city methods, ideals, and practices. What we want in the country is a country school, not a city one, a school teaching in terms of the country, one having teachers who have been brought up in the country, or in sympathy with the country and its problems, country teachers who will use the materials of the country.

The country people, too, are to blame for the ineffectiveness of the country school. The school is so often to them something apart that they take but little interest in its affairs. Little attention is paid to the selection of a teacher. Often the cheapest one is chosen, for the school is to such people an expensive thing, not a necessary, integral part of their lives. The board of directors

may or may not be chosen because of any fitness they may have for the office. All have not been trained to realize the role that the school should take in the affairs of the community. We find such people so conservative that they resent the introduction of new methods, "fads" they call them. Teachers who come with new, live ideas, have a hard row to hoe, are discouraged instead of encouraged. Nature study and agriculture are considered "fads", frivolities; and the three R's as the only means to an education. The sympathies of such people are not along the newer lines. Education, to them, means something above the industries and occupations of the people, something apart from this life, something in which the life, activities, vocations and affairs of the region play no part. If these people were trained to see the relation that life and vocation should play in the education of people, that preparation for life is not something apart from education, then the rural school problem (or city school problem) would not be so difficult. Education is preparation for life. In this preparation we must train the worker as well as the man, must consider vocation as well as avocation. The following quotations illustrate this point of view in education.

"It is said that Wendell Phillips once remarked, that, 'the best education in the world is that got by struggling for a living.' But we have said, 'we will first train men and then we will train workers'. Should we separate these ideas? Practically we have failed to a large degree in the first purpose, simply because a man's work is part of the man. So far, we have failed almost entirely in the second purpose because the boy has not waited for us to get through with the process of training him as a man,

according to our ideas of what the training should be. So we have had no chance to train him as a worker.

"We are yet inclined to treat preparation for life as something apart from general education. In some way we must coordinate these things. We must fuse them. Preparation for vocation must bear somewhat the same relation to schooling as vocation bears to life." Kenyon L. Butterfield, Page 273, 1909 Report N. E. A.

"No scheme of education is truly universal or can hope to become so until it not only touches and uplifts all classes of men but also touches and uplifts their industries as well; for it is not expedient that men should desert industry as soon as they are educated, but rather that they should remain and apply their education to the development of the industries, that the people may be better served, and the economic balance of things not disturbed by the evolution of an educational system aiming to be universal.

"The thing which all men everywhere now demand, whatever their vocation or means of livelihood, is not training merely, but education, and they mean by that, such contact and intimacy with the world's stock of knowledge as shall first develop the industry, and, second, but not secondarily, develop the man." Eugene Davenport, P. 277, 1909 Report N. E. A.

We hold that education should fit for life; yet how much has the rural school to do with the lives of the people of the community. Beyond some small attempts to correlate a few problems of the farm with arithmetic, we find no effort really to make the school life have any relation to the daily life of the child. History, reading, geography, writing, spelling, arithmetic, a little drawing



Clearing up the Gardens.
Fourth Grade.



Nature Study—Hen and Chickens.



Young Gardeners at the Colorado State Normal School.



Cleaning up Gardens.

and singing, these comprize the entire effort of the school. Nor is any attempt made in any way to make these vital to the children, but in the main these are taught and studied as something apart, something to be studied just to be studied, because that is the method of all schools, of all education, because these subjects are part of an arbitrary standard. Textbooks dealing with these subjects give fine evidence of the development of subject matter and precious little of the development of the child. They are the same for Portland, Maine, San Francisco, California, or Hale's Corners, Indiana. Lessons are assigned in them by the measure, and learned by heart in the good old Chinese way of some twenty centuries ago. Why should we be Chinamen?

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The Work of the Rural School Needs to be Redirected.

Now, it is not the wish to decry the value of these subjects and the part these should play in our education, but it does seem desirable to emphasize the need for an effort which will cast them anew, leaving out much that is useless, and bringing in much that is useful and vital to the child, something that will not make them alike for all classes and conditions of people, for all situations. We need, also, to emphasize the necessity of an awakening to the fact that these things are not the end of education, but only a means to an end, that really to make them vital we must connect them up with the child's experience, environment, and life, something which will make him realize on them. We must emphasize the need of teaching country-life subjects, of the fields and woods, streams and mountains, and all that lives there. Our subjects and our teaching should have more to do with the country and less with foren countries, more of the industries of the country and less of those of the city, more of the literature of the country and all its affairs, more of agriculture. The ideals should be changed so as to put the child more in touch with the country and country life; and to make him better prepared to live there. All the children may not live there, but the majority will.

Why give all a misfit education which fits none of them to live there, when so many will do so? As Prof. Warren tersely expresses it, "While it may not seem desirable to make farmers, it does seem desirable to stop unmaking them."

Agriculture will always be the chief business of the country, if we are to exist and prosper as a nation, if we are to endure, if we are to keep pace with the improvements in other industries, if our agriculture is to grow with these, country people must be placed in sympathy with their work, must be trained and educated in terms of agriculture and country affairs. In agriculture lies the prosperity of a nation, and in country life, its health and vigor. By careless, wasteful ignorant methods in agriculture we have depleted our natural stores of fertility. Agriculture, still destructive, must be made constructive.

Of late years the warnings have been sounded in many quarters. Conservation is the great by-word. Some go so far as to ascribe the present high cost of living to the wasteful, careless methods of farming. The story of the abandoned farm is heard everywhere (Prof. Bailey says it is a case of "abandoned brains.") We hear much of the need for a more scientific system of agriculture, of soil conservation, crop rotations, intensive and not extensive methods, that the farmer must be brought to realize the need of more scientific methods in tilling his fields, that he must be educated to better agricultural and business methods. Experiment stations, the U. S. Department of Agriculture, agricultural colleges, railroads, the better class of farm papers, all are working wonders in the spreading of the gospel of a new agriculture, bring-

ing to the farmer the principles and methods which countless experiments, analyses, and observations have proved. Wonderful indeed is the progress that has been made. The following statement of Prof. Bailey, Dean of the Cornell College of agriculture, Ithaca, N. Y., gives an idea how great the influence of such an institution is and how much greater it might be if the institution were given better support.

“We are conducting reading courses with no less than 16,000 farmers and farmers’ wives in New York, yet there are a half million such in the state. We are reaching at this moment no less than 7,000 teachers, but there are 40,000 school teachers in the State and hundreds are being prepared each year. We are reaching 65,000 children this year, out of one and one-half million in the elementary and high schools of the State. We are conducting demonstrations or test work on some 300 farms out of the 227,000 in the State. We are teaching one student for about every 500 farms.”

Agricultural papers and the bulletins of the experiment stations bring to the farmers of all the states the facts and principles of a better agriculture. Great is the effort made to reach the farmer, yet the great majority are still not reached. Then, too, while some may be reached, these may not be touched. It is one thing to read and another to apply.

So far the greater majority of our country people have not been educated in terms of agriculture. They cannot interpret the many natural factors influencing agricultural operations, for they have not been trained in terms of nature, to adjust their operations according to her laws and workings. The application of an agricultural

principle, rests on a knowledge of natural laws, and therefore must be difficult where no knowledge of these laws and workings exists. The business of raising crops is influenced by more natural factors than any other, and these influences vary with every locality, farm, and perhaps, field. A farmer who has been farming his life long according to some arbitrary standard of his fathers before him, or of his neighbors, cannot so easily adjust himself to scientific methods whose application depends on a knowledge of conditions of which he is ignorant, of terms in which he has not been educated. How can we reasonably expect a rapid adjustment to influences when so little attention has been paid to utilizing these means and terms of education?

Better farming, improved business methods in the production and sale of crops, a greater agricultural prosperity, a more contented, rural population, will come only when the people of the country are educated in terms of the country, when their education grows out of their lives and back into their lives, when, in addition to the development of the man, some attention is given to the development of what he does, to the development of a sympathy and interest in all that influences country life and affairs. Nor can we catch up by beginning with the farmer. The place to begin is in the rural school, for here we have the farmers and the farmer's wives of tomorrow. Here the twig must be bent that the bough may be inclined.

If the children of the country of to-day are trained natureward, homeward, and farmward now, they will have a wider base of knowledge, wider sympathies and interests in the future to help them in all their occupa-

tions and activities of the farm and home. Children who are stimulated to study nature, to see what they are looking at, will think for themselves, interpret the facts of nature, and this will lead to knowledge and principles, which later will be applied in their occupations, in farming. Boys trained thus, have already opened wide the eyes of their fathers, not so trained, by the increased yields which the application of principles thus learned have brought them. In the World's Work for July, 1910, is a picture of the "Corn Kid," a little Southern lad who raised 80 bushels of corn where only 15 had been raised before, thereby winning as a prize a free trip to Washington, D. C. Scientific agriculture must always consider careful observation, reasoning, and interpretation of the facts Nature presents, for who is more directly concerned with nature than the farmer? Does not he work with soil, plants, and animals, and all the things that make these prosper or perish? Would it not be of inestimable value to him as a worker in Nature's workshop to be able better to understand her workings? A vast number of farmers still farm by the moon. The nature-student farmer does not farm by the moon, but according to the laws of nature, plowing his soil and planting his seed when the soil is fit whether the moon is so or not. He does not farm by rule of thumb, or by his grandfather's precepts and precedents, but by watching nature and following her. He farms by principle, but his application of such principles is modified by his knowledge of the influence of nature in his own fields, by his knowledge of the particular conditions prevailing on his own farm. The successful manufacturer must know every outside influence that may affect his business, yet see how few these

are compared with the outside influences affecting the business of farming. The farmer is at the mercy of all the elements, of all nature, for his workshop is in the open; and yet see how little he has concerned himself with becoming familiar with these influences. Nature study aims for a better acquaintanceship with nature. A direct result of this would be a greater knowledge of nature's laws, a wider base of knowledge to help in all the business of farming, since farming is so influenced by nature.

Then, too, country children who are trained nature and countryward, to be interested in nature, will see more in the country than a business, for they will grow more into sympathy with their environment. With wider interests, with eyes wide open to the beauty and charm of the open country, aware of the many advantages of fresh air, clear skies, green fields, of brooks and woods, they will see in the country a beautiful place for a home. As they grow up, they will strive to improve this as well as the farm. With this will come a greater content, a better satisfaction with country life, a new rural spirit which will uplift all. The higher ideals will be expressed in better farms, and better homes as well, in better roads, schools and churches, and a better country life.

The rapid spread of the Nature study movement is a flattering indication that educators are gradually awakening to the fact that if education should fit for life, that it must teach in terms of life, in terms of the environment and affairs of people. To-day, nature study and agriculture are taught in many schools the country over. Some states have passed laws compelling instruction in agriculture. Some are establishing special elementary and secondary agricultural schools. Our colleges of agri-

culture are hard prest to supply the demands for instruction in agriculture. One measure of the popularity of these subjects at the present time, is the great number of textbooks on agriculture and nature study which have been publisht within the past few years. Nature study and agricultural leaflets are being publisht by the score. We even have nature study readers and arithmetics.

The Aims in Teaching Nature Study and Agriculture.

Nature study has been defined in many terms and taught by many methods. Long and wonderful is the list of things that have been taught under this name, and many are the ways in which these have been taught. I know of no subject which has been received with so much enthusiasm and yet has received so much criticism, no subject which has caused the teacher more concern. Many mistakes have been made. There are those who cannot adjust their ideas of formal discipline to the informal methods that mark good nature study teaching. Some extremists develop only certain phases of nature, thereby giving one sided views of nature, in their studies of a few types. Such teachers make "complete" studies and analyses of insects, for example. Often nature study is taught as a sort of elementary science, something to be studied for the facts that are to be gained. On the other hand, many teachers teach nature study as a kind of amusement, with bright, interesting fairy tales about nature. Others, again, "correlate" nature study to death. All seem to have misunderstood, or failed to see, the true point of view, seeing in nature study only another subject of the schoolroom, something to be studied for the facts to be gained. So accustomed are we to the information

giving and examination method, that this has blinded us in the attempt to teach nature study. We are still slaves of the book-teaching habit and cannot adjust ourselves to a point of view so radical that it will have nothing to do with text-books and information giving; one that does not consider so much subject matter, so many pages to learn to-day, so many to-morrow. The formal learn-by-heart method has bound us.

Then, too, people who have never been trained to study nature, to see what they are looking at, can hardly be expected all at once to teach others to look for themselves. It is startling how little the average person sees of nature, tho he may be outdoors all day. It is as if our eyes were covered with black goggles, and our ears filled with cotton. New students of the Normal School must be brought to a flower, tree, or any unusual or even common nature object, which our beautiful campus may boast, must have this pointed out to them in a special lesson, before they are aware of something which they may pass three times a day. The campus is the home of many birds of many species, yet the average student hardly sees these, can hardly distinguish a sparrow from a housefinch. It is astonishing how little we see of the world around us, how closed our eyes are to nature. What wonderful secrets roadsides, fields, woods, and streams hold for us, if we could only learn to open our eyes to look for them and to read them.

This is the true aim of nature study, the awakening of a living sympathy with all that lives and is about us. Nature study is nature sympathy primarily. It is not another subject to be added to an already crowded list. It is not facts. It is not science, not knowledge. It is spirit,

a spirit which should be part of the teaching of every subject of the schoolroom. It should be the spirit of every school, and the teaching of every subject should center around it, for nature is the environment of children, and these should be taught in terms of their environment. In this way the child will be placed in first-hand sympathetic relation with the common things of the outdoor world, and be inspired to have a living and ever increasing interest in everything that lives and is. Then the country will have a new and greater meaning to country people. Then the country will be the ideal home. And this must come if farming and farm life are to be permanent. A better agriculture alone will not improve the conditions as they are, will not make for the greatest content. You cannot appeal to all people in terms of more bushels of wheat, more tons of hay, more bales of cotton. No matter how profitable the business may be, unless the home conditions are what they should be, we shall not have content. We need better farming, but we need better farm homes, a better country life also. The new education must touch the home and the business by interesting the country children in the country, in farming and the home, by teaching in terms of those things which make these up.

The solution seemed easy to many. All that would have to be done would be to add nature study and agriculture to the curriculum of the school. That this has failed we already have many evidences. The reason for these failures lies in the fact, already pointed out, that these are taught as separate subjects, while the spirit is missing. The whole problem is not so much the addition of the new subjects to the curriculum, as it is the

need of a redirectiv effort which will recast the whole teaching methods of all the subjects of a school. The mere addition of technical studies in nature study and agriculture will not bring about a change in the point of view. As Professor Bailey says: "A consideration of the school question will enable me at once to illustrate what I mean by the redirecting of rural institutions, and also allow me to suggest the relation of such redirection to local pride and initiative. These rural schools fail because they do not meet the needs of the people. They do not teach the objects and affairs of their community. But in all this they differ from all other schools only in the fact that they are slower. Neither are city schools often really vital. Neither, perhaps, is the greater part of our collegiate instruction. Until very recent years even the agricultural colleges have not taught vitally. The public schools do not yet teach the essentials. The first object of any school should be to teach people how to live. I hold that education in terms of the environment is the right of every man; and in the open country this kind of education is agricultural education, whether it is called so or not."

"All effective education should (1) develop out of experience; (2) this experience should have relation to vocation or to the pupil's part in life; and (3) every school should be the natural expression of its community. If these statements are accepted then it will be seen that the mere addition of a subject here and there in the school curriculum may not be sufficient to put the school into relationship with its environment."

To repeat then, we have failed in teaching nature study because we have misunderstood the aim, have failed

to catch the point of view. We have tried to teach nature study and agriculture as separate subjects, from leaflets and text-books, in about the same way as we teach ancient history. Text-books on agriculture are appearing by the score, yet these, too, fail to catch the point of view. All try to cover the agriculture of the world, from cotton-growing to landscape gardening, and only briefly touch the affairs of country life, in a few principles applicable to the particular community, but which, in turn, may not be applied because the teacher may not see. They are all studied as is the rest of the book. In teaching agriculture the principles must have direct bearing on the particular community, and, thus, some effort must be made to use the affairs of that community and then branch out. We have a well known text-book on agriculture, which in a chapter on farm crops devotes some thirty pages to the following crops, viz: cotton, corn, tobacco, wheat, peanuts, sweet potatoes, and rice. Of these only one, namely, wheat, is grown in Colorado. No doubt the book was written for Southern conditions, but it is being distributed all over the country. How about the children of Colorado in whose hands it should fall, who will have to learn about these crops and nothing of the crops which are grown in Colorado? Why study the sweet potato and learn nothing about the common potato; why learn all about peanuts and nothing about the sugar beet—peanuts and sweet potatoes, sugar beets and common potatoes, which are most familiar to the country children of Colorado, and which will be most considered in their lives? It is good to know something of the farm crops of the world, but why neglect those of the community for those of foren regions? One should learn

something of the general principles of agriculture, but this should grow out of the methods and experiences of the community first. Then, after the application to home methods has been made, we may study the wider application briefly. The principles of crop management and tillage are entirely different here from those of the South or East, so much so that farmers from the East or South who engage in farming here, must unlearn much and learn anew. Of what use is a text-book, then, written in New York or Virginia? We must learn to sidetrack the text-book and begin with the community; and let our agricultural education be one too, which will consider something more than facts and principles. A true agricultural education would be defined in broader terms. When agriculture is the spirit of a school, one felt in all the material, subjects, and methods, in the attitude of teachers, pupils and patrons, then we may truly call the teaching of such a school, agricultural. Professor Bailey tersely defines agricultural education "as the training of a man by means of country life and rural subjects, not merely the making of farmers." Agricultural text-books may make for better methods of farming, but, as I have pointed out, the problem of the country is deeper than that. We need more than technical knowledge of better farming. By the text-book we merely add another subject to the curriculum. The ineffectiveness of such teaching is well summed up in the following statements of Professor Bailey:

"The final ineffectiveness of merely adding agriculture to the curriculum lies in the fact that it does not constitute of itself a real redirection of the whole point of view of the school, altho it may be a most useful means

of starting a revolution that will bring about that desired end.

“The problem of the rural school is not so much one of subjects as of methods of teaching. I can conceive of a school in which no agriculture is taught as a separate study which will still present the subject vitally from day to day by means of the customary studies and exercises.

“I would not isolate agriculture from the environment of life in order to teach it. I would teach the entire environment.” *The State and the Farmer*, L. H. Bailey; The Macmillan Co.

How to Redirect the Work of Work of the Rural School.

The difficulty lies in the fact that we have not been trained in terms of our environments and cannot teach in terms of this, yet once the point of view is got hold of, once we see the need of a redirective effort in rural school teaching, this will be found to be easy. This point of view insists that we must teach in terms of the environment, and that the material of the school should be made up of the things with which the child comes in daily contact. These can be grouped under the general terms "nature study and elementary agriculture," and the customary subjects of the school will be taught from a nature study and agricultural standpoint. To put this another way, the subjects and methods will be developed with the study of nature and agriculture as the general spirit of all, and these will be the soul of the teaching.

To illustrate, geography has been defined as the study of the earth as the home of man. How little we concern ourselves in the ordinary school in our studies of geography with the relation of man to the earth of that particular community in which we are teaching. How little we have to do with the affairs of that community, with its settlement, industries, occupations, markets, climatic influences, natural features, streams, hills, woods, and roads,

of the customs and practises that prevail there. Surely, it would seem as if these should, at least, be the beginnings of our geographical studies. Yet what do we teach? The average boy knows more about the principal products of Turkey than he does of those of his own community, county or state, knows the boundaries of foren countries and not those of his own township or county, knows the customs and industrial history of the whole world, but not of his own people.

And so with arithmetic. How little it has to do with country affairs and the problems country people have to solv. A teacher confest that she was nonplust, when, after an entire course in arithmetic, an eighth grade pupil of hers wanted to sell a stack of hay and could not figure out the amount of hay it containd. We could easily make arithmetic more vital by using problems which the farmer meets every day. In mensuration, for example, problems might be given in computing farm areas, (actual measurements should be made on the ground) estimates on the cost of building construction, in board measure, in square and cubic measurement, as in concrete work, fence building, and road building. Also one might have many problems involving the cost of production of the various crops and products of the farm, and the freight and market charges in getting these to the market. Some simple experiments in the growth of plants might also furnish problems by which the amount of water used by plants might be learned. A thousand and one applications might be made. As we teach it today, arithmetic in the rural school has too much to do with problems that have little relation to the life and industry of the people. We give too many problems in

stocks, bonds, and percentage, and none in terms of the farm, problems in cornstalks, barns, crops and animals. Our arithmetic has little to do with the child's experience and environment.

The same general criticism can be made of the other subjects of the average school in the country. How little our readers have to do with country life and rural affairs, how little they instill a love for the country and all its affairs, how little they make for a country spirit. We need readers that will help to spiritualize the country, glorify the country and the man who works there. Our readers tell too much of the affairs of other countries, of war, deeds of heroism, etc. They should have more poetry and more prose of nature, of country life and the farmer. Our spelling books still deal with catch-words, rather than with those of everyday usage.

Manual training still aims for skill and not for service and utility. The formal exercises that characterize so much of the Manual Training work in this country is likely to stifle interest and enthusiasm. Manual Training should come in our rural schools, but it should have application to the lives of the boys. No expensive equipment is needed; a hammer, saw, plane, square, and some nails, these will be sufficient at the start. Instead of engaging the time in making miniature articles meant to develop mechanical skill, things that have no practical use, the work should have a more direct application. Begin with the school. Here doors and fences may be repaired, the gates hung; outhouses, sheds, garden frames, and window boxes, chicken-coops, wheel-racks, shelves and other useful things can be made. The younger people might construct toys and the hundred and one things the average

boy wants to make,—traps, boats, water-wheels, wind-mills, and so forth. In making the smaller buildings, one could bring in the first principles of line and design, which would be of great benefit in the future building of barns and houses that might be done in the community.

In history, we are likely to know all about the significant events of the Old World, of the explorations and settlements of new countries, but nothing of the early settlement and history of our own community, township, and county or state. We know the government of foren countries by heart; yet are ignorant of the government of our hamlet, city, or state. We are familiar with the biographies of the great men of the world, but know nothing of the people who have most influenced the affairs of our own community.

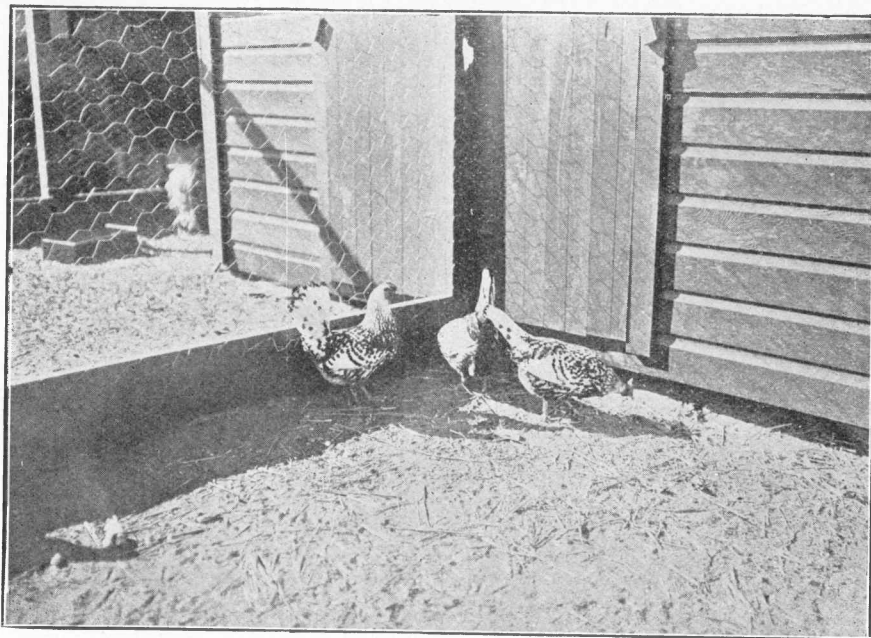
Our school-gardening is still a thing of sentiment, rather than one of practical utility. The average child does not realize on it, carries little away with him that is useful. This is one of the richest agricultural regions in the world, and yet I know of no place where school gardening might have a greater application. The grounds of the school-houses and farm houses need to be made less dreary and cheerless by planting of trees, shrubs, and flowers. Some of the country people even buy their vegetables of a vegetable peddler, or eat cand goods, instead of the fresh, crisp vegetables home gardens might produce for the entire year. We need school gardening which will tell the people what varieties of fruit, vegetable and ornamental plants are best suited to this region, and the management of these. A well managed vegetable and fruit garden would have a wonderful practical value in bringing home to the pupils of to-day, the farmers of

to-morrow, the important principles of agriculture, besides stimulating a desire for a more diversified and intensiv farming, and a more comfortable farm life. Yet, Arbor Day is for the most part still without meaning or utility. We sing songs on that day, recite poems and read about what Nebraska has done, and then go to work on the spelling lesson, leaving the grounds as desolate and cheerless as they always have been, while the home premises are disorderly and neglected. Most country school teachers will give a dozen reasons why school gardening cannot be done in the country school. Hardly one will tell how it might be done or why it should be done. We look for excuses—poor soil, lack of water, and a hundred and one other things, instead of beginning by planting. In the cities this movement has met with wonderful success. Whole cities have been improved and beautified. Surely it is much harder to raise plants in the city. Why do we have civic improvement and not rural improvement?

In this redirectiv effort to make the country school more efficient, we must first look to the teacher for aid. Afterwards we may reach superintendents, patrons, and the country people, but the first molding of a new point of view must come from the country school house. This should be the center of the community in every way. The teacher should realize the importance of her position, that she is something more than a hearer of lessons, that she may be a missionary, a molder of public opinion a' ug many lines. Her influence will be felt in the homes, as the children carry to mother, father, and sister the new ideas. The country children of to-day are the farmers and farmers' wives of to-morrow, and that to-morrow,



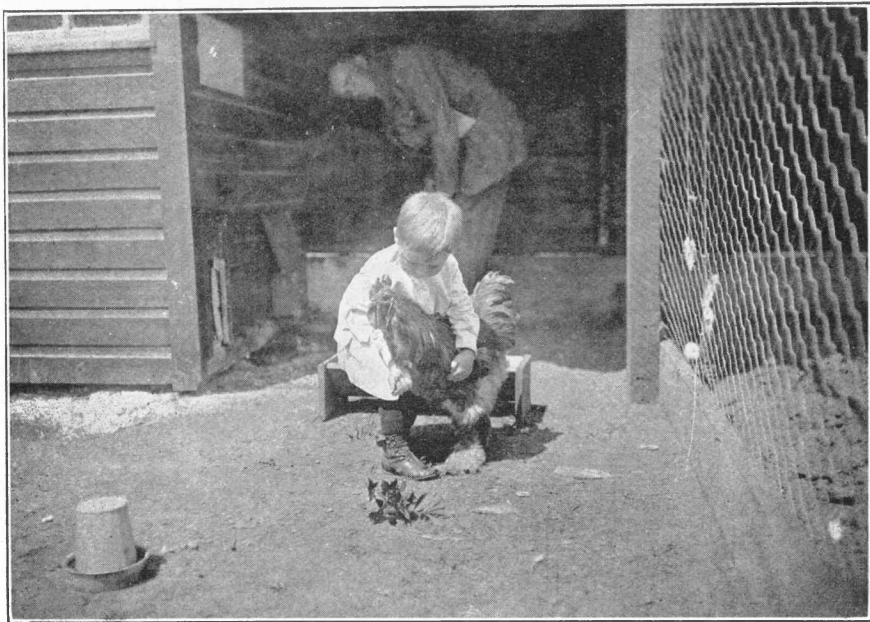
Museum of Elementary Agriculture.



Elementary Agriculture—Poultry.
Silver Spangled Hamburgs.



Nature Study—Watching a Porcupine.



Nature Study.

with its men and women inclined by their early teaching to a more rational educational and life spirit, will soon be here. Then the work will more easily be carried on, but we must begin with the children of the country school, and we must begin NOW.

For this missionary work, to carry on the gospel of a new country life and spirit, to build a new country, we must have teachers who are trained in terms of country life and rural affairs, and who have been led to be in sympathy with all that makes up life in the country. Such teachers must have considerable knowledge of nature and the open country, must be trained in terms of these things, must be brought into touch with the newer points of view. The new country teacher must be educated and trained along the lines of this new redirective teaching. Above all she must be brought into sympathy with her field, to realize her great opportunities there, to be led to realize that she is something more than a hearer of lessons.

The Training of Rural School Teachers.

The logical place for this training is the Normal School. There are those who favor agricultural colleges, but here again we are placing emphasis on technical training; whereas, attitude, spirit, and enthusiasm are to be developed. Technical training may seem essential, but just now we need teachers who will first of all spread a new interest and enthusiasm in country life. These will need some knowledge of agricultural methods and principles, and this can be got at the Normal School as well as anywhere. There are agricultural colleges that are taking up this work, but, unwillingly, perforce, because the normal schools fail to realize their position, refuse to teach the newer gospel. Agricultural colleges have other functions to perform. Some might favor the agricultural college as a training place for the country teacher because of the greater equipment such institutions have. But here again we make the mistake of being blind to the true situation, one that demands not so much technical training as practice and spirit. With the aid that will come, once the interest is fully awakened and the need realized, a better equipment will be provided for the

normal schools. The normal school has many distinct advantages for training teachers which the agricultural college does not possess.

The normal school is the heart of the educational system of a state. Here is where teachers are trained. Here actual practice in teaching is given. Here the many problems of teaching are presented and met. It is the business of the normal school to fit teachers.

The Colorado State Normal School is especially well fitted for training teachers for teaching in rural communities in terms of the new point of view here expressed. At this school the effort has always been to interest all in nature and country life. It has never encouraged merely scientific specialization except for those who intend to teach science. It can truly be said that we have never encouraged the fact-giving sort of scientific study which characterizes so much of the science and nature study in this country. The attitude has always been that of putting the students in sympathy with their surroundings, with nature, not one of high specialization. The view has always been broad.

A special diploma will be given to students who take the major part of their work in the Department of Agricultural Education of this school. In this department the following courses are offered for 1910-1911. No doubt in the near future more courses will be offered. These courses fall into three groups, viz: (1) natural science; (2) agriculture; (3) The rural home and community.

Course 1. Nature Study.

The theory, practice, and material of nature study. De-

signed to fit teachers for teaching nature study in the elementary school. In this course we consider:

I. The Nature Study Idea. A review of the writings of Professor L. H. Bailey, S. C. Schmucker, C. F. Hodge and others, on the aims and ideals of nature study teaching. The significance and importance of the nature study movement. The theory and practice of nature study teaching.

II. The Material of Nature Study. First hand acquaintanceship with the good and common things of the outdoor world, thru actual, first-hand observation in garden and laboratory, field and plain. Five hours a week. Fall, winter and spring terms.

Course 2. Elementary Agriculture.

The elementary principles of soil, plant and animal management. Designed to fit teachers for teaching agriculture in the rural school. Some practical work is given in greenhouse, field and garden. In addition to the study of agriculture, some effort is directed to studying the social and home life of country people, to make the rural teacher feel that she may influence those outside of the school. Five hours a week. Fall, winter and spring terms.

Course 3. School Gardening, Outdoor Art, Plant Production.

Meaning of the school gardening movement. The relation of gardening to nature study and elementary agriculture. The school garden as the laboratory of nature study and agriculture. Practice in garden handicraft. Planning and planting the school garden. Plants in relation to soils and the management of soils in crop produc-



Eighth Grade Farm.
Defiance Wheat,



Eighth Grade Farm.
Broom Corn.

tion. Propagation of plants. Seedage, cuttage, and graftage. The principles of landscape improvement applied to school and home grounds. How to beautify school and home grounds. Studies of the best nativ and introduced decorativ plants. Five hours a week. Winter and spring terms.

Course 4. Soils and Crops of the Farm.

The origin and formation of soils. Classification of types and uses. The relation of soils to plants. Physical properties of soils. Chemical properties of soils. Physical and chemical agencies used in the management of soils to augment productivity. Cultivation, irrigation, and drainage.

Studies of various crops of the farm and their management. Soil and seed selection. Cultivation and care. Harvest, storage, sale, and use of the various crops. Crop rotation. Farm management. Five hours a week. Fall and spring terms.

Course 5. Animals of the Farm.

An elementary course in animal industry, in which the types and breeds of farm animals are considered. The care and feeding of farm animals. Principles of feeding. The production and marketing of the various types. Relation of animals on the farm to the soil. Utilization of by-products. Importance of animals in diversifying farm occupations. Five hours a week. Fall and winter terms.

*** Course 6. Dairy Industry and Poultry Husbandry.**

Types and breeds of dairy animals. Selection of breeds for dairy purposes. Feeding for milk. Crops suit-

able for feeding. Care and management of dairy animals. Construction of stables and shelters. The production of pure milk. Care of milk. Handling and sale of milk. The Babcock milk test. Making of butter and cheese. Production and sale of dairy products.

Poultry husbandry. Types and breeds of poultry. Selection of breeds to meet the ideal. Care and management of poultry. Feeds and feeding. Construction of poultry houses and poultry yards. Breeding of poultry. Rearing of young. Production of meat and eggs. Sale of poultry and poultry products. Five hours a week. Spring term.

*** Course 7. Horticulture on the Farm.**

Types of plants suited for fruit production. Principles of fruit growing. Selection of varieties. Propagation, cultivation and management of fruit plantations. The home fruit garden. Insects and diseases of fruit and ornamental plants. Insecticides and fungicides. Sale and use of fruits. Fruit storage and preservation. The home vegetable garden. Planning, planting, care and management of same. The principles of landscape improvement applied to the beautification of home grounds. Five hours a week. Fall and spring terms.

Course 8. The Farm Home.

Domestic science, sanitary science and home improvement. The improvement of life on the farm by improving the conditions of the home. Five hours a week. Fall Term.



Eighth Grade Farm.
Defiance Wheat.



Eighth Grade Farm.
Broom Corn.

* Course 9. Rural Sociology.

The social status of rural communities. Social factors in rural progress. Improvement of social life of rural communities. Isolation of the farmer. Means of communication. Social influences. The country church and the country school as centers in rural communities. Social organizations. Improvement and enlargement of these opportunities. Occupations in the country affecting social status. Three hours a week. Winter Term.

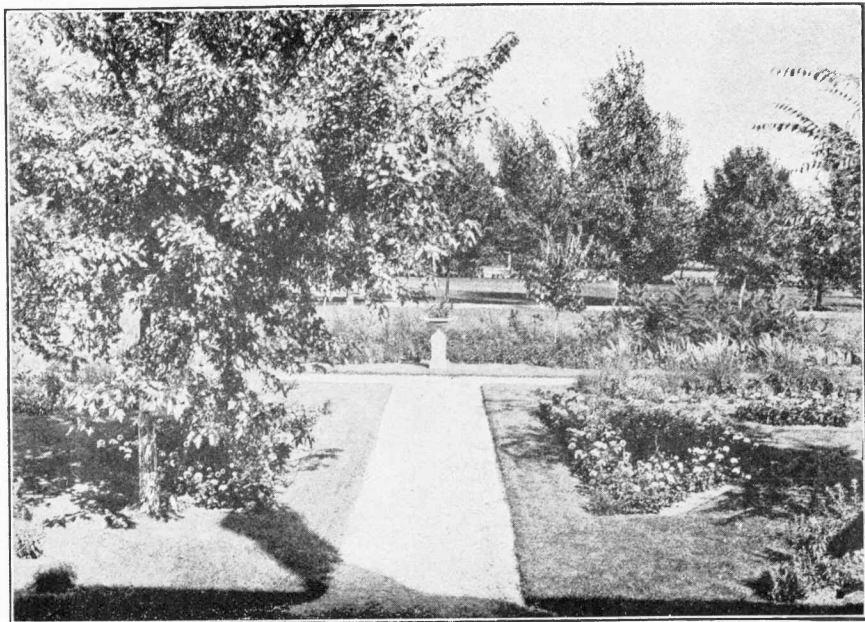
* Course 10. The Rural School.

Improvement of teaching methods in the country. The rural school as the center of a rural community. Importance of improving the equipment, indoors and out. Improving the school grounds. The consolidated school. Agricultural education. Five hours a week. Winter Term.

In this department practis is given in teaching nature study, elementary agriculture and the like, in the training school of this institution. This work is under the supervision of people in sympathy with the new point of view in education, experts who are thoroly in sympathy with the field of the rural teacher and the problems and situations she meets there. Excursions are made to the rural schools in the neighborhood.

We are gradually getting a very satisfactory equipment. Our campus is the most beautiful in the state. Here we find many species of plants, both nativ and introduced, all arrangd in accordance with the best principles of landscape design. Here we have a large greenhouse, where practis in garden handicraft and laboratory work in elementary agriculture and nature study is given. We have

large school gardens worked by 150 enthusiastic children. We have fruit trees and nurseries, too, and the kinds of ornamental and fruit plants suitable for planting in this state may be found growing here. Poultry yards with many varieties of fowls serve a very useful purpose in the practical studies of some phases of farm industry. A tract of several acres is given over to a farm where trial plots of the crops of this region, as well as some that might be suited to this region, are grown. These farms are managed by the boys of the eighth grade. Indoors we have museums most completely equipped for illustrative work in the field of nature study and agriculture. Withal the Library is rich in works on general education, agricultural education, nature study, science, horticulture, and the subjects related to farming and country life.



Italian Garden on Campus.



Cleaning up the Gardens in Fall.

Some Suggestions for Nature Study and Agriculture.

Elsewhere the attempt has been made to show what the point of view in nature study and agricultural teaching should be, that the teacher should use the material of the country, that she should teach in terms of the environment of country children, in terms of the country, and teach in such a way that interest and enthusiasm, sympathy and spirit would be paramount. Herewith is a brief outline of the subjects used in nature study and agriculture in this school. It is hoped that this may be suggestiv to the teachers of the state. It must be suggestiv only, since every region brings different situations and material, and the teacher must look to her environment for material.

In the lower grades the work is mainly observational. Children are stimulated to look more to nature, while stories and songs increase this interest in the fourth and fifth grades, the children are trained to look for more than the fact, to try to understand why it is so, the reason for the fact. The children are stimulated to try to understand as well as to see, to read for themselves and to try to connect what they discover with other things they have learned, to connect this up with their own activities and experiences. In the sixth, seventh, and eighth grades

the basal facts are reviewed somewhat and their application to agriculture and the country brought out. Here we have also practical work in agriculture in which are followed the general methods and practices that prevail in this region. A study of rural life and conditions is also made. The children are made to work, to study, to dig out a truth for themselves, to realize that all this is a serious part of their school work. They are not told these things as pleasant bits of information.

In the work we follow roughly a sort of calendar of farm and garden operations, and also study the things of nature as the seasons present them. We try to make the school-garden work vital to the children, try to give them something that they can use. Thus, for example, they are trained to grow flowers and vegetables, but not to stop at the mere handicraft of gardening, but try to use such varieties as are most suitable for home use. They grow these in the way that they should be used at home to serve best the purposes of beauty and utility. We teach what varieties of flowers to plant, but also how to plant them to secure the most effective beautification of home grounds. We stimulate a desire to make such improvements permanent by encouraging the planting of shrubs and trees about the house according to the principles of landscape design. We are trying to foster first a greater pride in the home, and then a greater civic pride and pride in the country. Sometimes we give shrubs to the children for planting on the home grounds. We are also trying to stimulate the planting of fruits, something which should be encouraged in this region as much as possible. We are trying to make the country people realize that by growing fruits and vegetables, that by making the

home grounds more cheerful and beautiful, that they will be less dependent upon the city, that they can then live better and cheaper, and withal be more contented as they realize more and more the many advantages of a good country home. The school gardens, nursery, greenhouse, problem farm and the campus present actual problems and experiences, and the children are made to work, actually to dig, plant, cultivate and care for their crops. In this way they get some fundamental principles of gardening and agriculture, of ground preparation, fertilization, rotation, seed sowing, seed selection, care and management of crops, etc., at first hand, in a way that the knowledge will always stay with them, and in such form that they may use and apply it.

One of the features of the 1910 Agricultural Fair of Weld County was the exhibit from the school gardens of the Colorado State Normal School. There were 105 varieties of garden vegetables in this exhibit, all of which were grown by the children of the Training School. About twenty varieties were entered for competition. Fifteen prizes were awarded this exhibit, which indicates in a measure the qualities of the products exhibited. Since all school children were admitted free one day, many saw this exhibit, and this held their interest to a large degree. The educational value of such an exhibit is great. It showed what children can do, and no doubt will stimulate many to take a greater interest in gardening and farming.

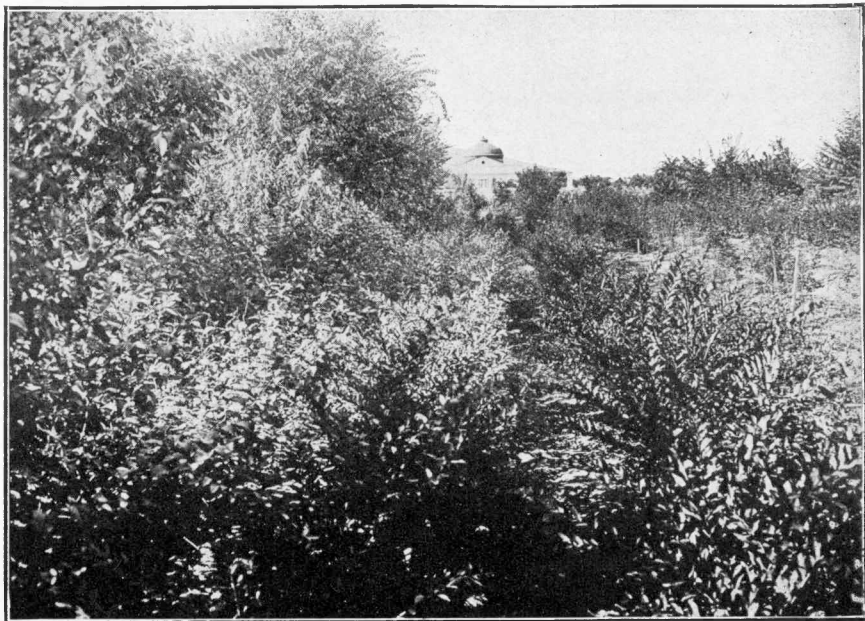
Outline of Subjects for Nature Study and Agriculture.

Lower Grades—Fall and Winter.

Fall work in the garden. The maturing of growth. The offis of the flower. The production of seed. Collecting seeds. The harvest. The harvest on the farm. Dispersal of seeds and fruits. Use of fruits. The storage of crops. Preparations for winter. The ripening of growth in plants. Autumnal coloring and the fall of leaves. How plants spend the winter. The cutting off of the food supply for animals. The migration of birds. Insect studies. Insect homes. How the reptils spend the winter. How the four-footed animals spend the winter.

The wether changes and their effects on all nature.

Wether observations. Studies of the skies. Snow, frost, ice. The class calendar. Winter studies of trees. The non-migratory birds. Birds from more northerly regions. Mountain birds that spend the winters here. Hibernation of animals. The preparations of the farmer for winter. Winter occupations of the farmer. Domestic animals. The poultry yard. Studies of chickens, pigeons, turkeys, horses, swine, sheep and cows. Studies of domestic pets. Bird and animal protection. Winter feeding



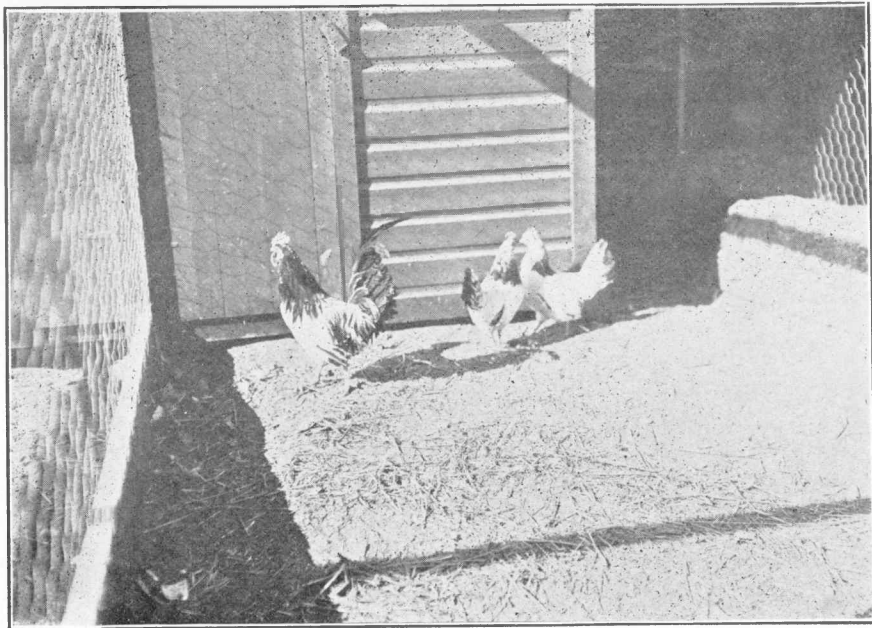
Nursery.



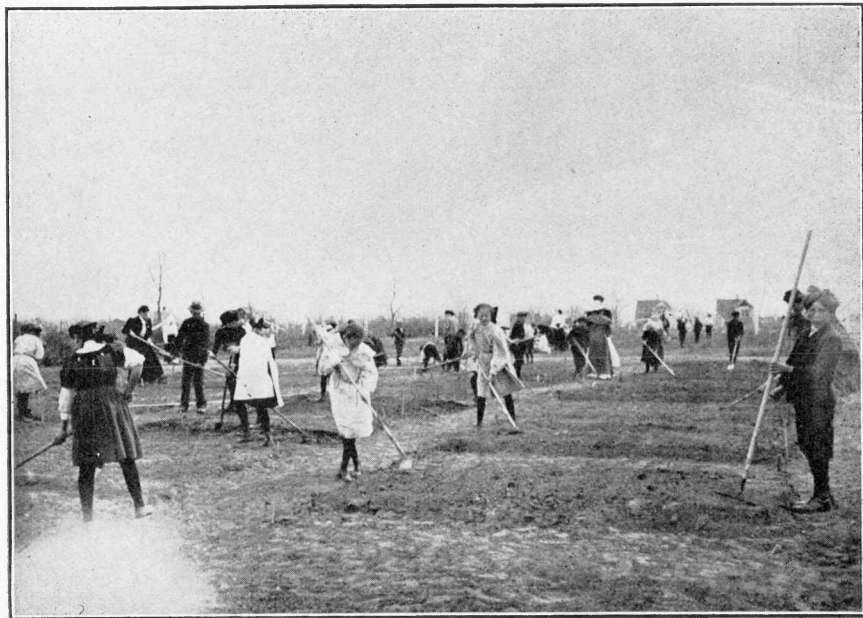
Harvesting Popcorn.



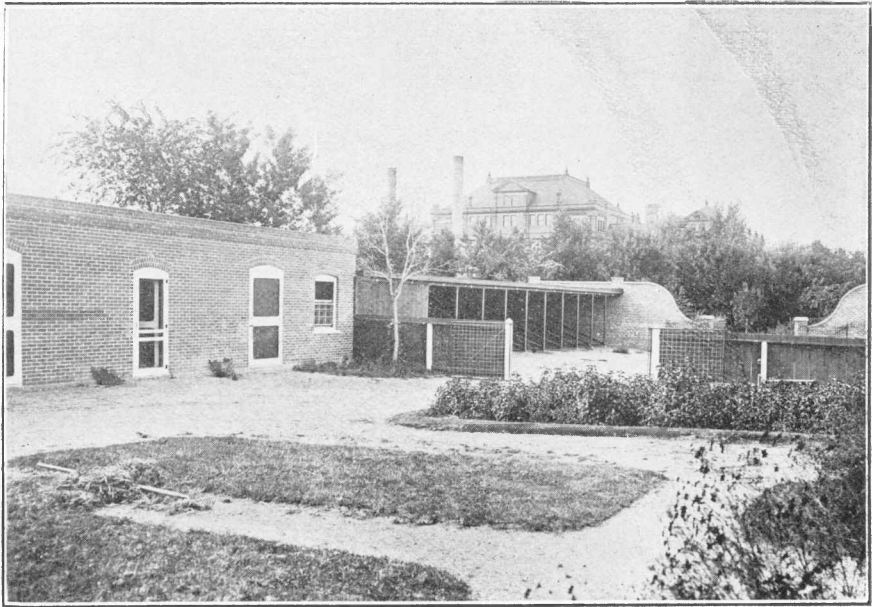
The Greenhouse.



Elementary Agriculture—Poultry.
Lakenvelders.



School Gardening at Colorado State Normal Training School.
Preparing the Ground.



Stables.

of birds. Work in the greenhouse. The germination of seeds. The growth of plants.

Spring and Summer

The return of spring. Temperature changes and their effects on all nature. The growth of trees and plants: budding and blooming of trees. Studies of buds and leaves. Preparations on the farm. Plowing, harrowing and fitting the land. Planting of early crops. The effect of the winter on all life of the farm. Garden preparations. Thoro fitting of the soil. Preparation for early crops. Planting of early salad and flower crops. Planting of tender crops in greenhouse or hotbed and transplanting to garden. Cultivation and watering of gardens. Care of same. Enemies. Insect pests. Weeds. Names and recognition of nativ flowering plants. Arbor Day celebration. Planting of trees and shrubs in home and school. The improvement of the home grounds. Cleaning up the home grounds. Planting. The return of the birds. Recognition and names. Studies of song and plumage. Nest bilding and rearing of young. Food getting. Life habits. Life habits of the commoner four-footed animals of field and home.

Upper Grades—Fall and Winter.

Insect studies. Offises of flowers. Relation of insects to seed and fruit production. Studies of caterpillars and larvæ. Insect homes. Economic aspects. The destruction of harmful species. Spraying for biting and sucking insects. Insects that destroy stored grains. Birds as insect destroyers. Migration of birds. Birds as weed

destroyers. Adaptations of flowers to secure insect visitations to the flower. Adaptations of seeds and fruits to insure dispersal. Protective adaptations of plants. Of insects. Principal crops of the region. How grown. Their harvest, storage, sale, and use. Harvest of crops grown in school garden. Preparation for market or table. Storage. Fall operations of the garden. Seed collection and selection. Preparation on the farm for winter. Feeding of animals. Winter preparations of the soil.

Hibernation of animals.

How animals spend the winter. Food for winter. Storage of. Manner of getting thru winter. Protective adaptations. Winter pelage of the fur-bearers. Winter habits. Relation of birds and mammals to man. Studies of animal tracks. Study of rodents. Game laws. Protection of animals. Destruction of harmful species. Winter studies of trees. Identification by winter characteristics. Adaptations of plants for conserving moisture. Studies of the evergreens. The soils of the region. Effect of elements in soil making. Wind and water as carriers of soil. The work of plants in making soil. The plant in relation to the soil. Adaptations of plants to the soil. Uses of soil. Elementary studies of plant physiology. Movements of plants. How plants get their food. Propagation of plants. Experiments to determine soil properties.

Spring—The return of spring.

Weather changes and effect on all nature. The relation of climate to crops grown. The changes in plant

life. The budding and blooming of trees. Studies of plant societies and adaptations. Studies of fishes and reptils. The return of the birds. Bird calendar. Spring plumage of birds. Song. Nests and rearing of young. Food and manner of getting. Economic bird studies. Bird protection.

Preparations on the farm.

Spring plowing. Value of thoro fitting of the land. Planting of crops. Subsequent cultivation. Cultivation to kill weeds and to conserv moisture. Similar preparations in the garden. Planting of early crops and their care. Preparation for special crops.

The dairy industry.

Studies of dairy breeds of cattle. Care and handling of milk. The milk test. Water supply of the farm. Danger of contamination. Sanitation on the farm.

Poultry husbandry.

The eg breeds and meat breeds. Feeding for these purposes. Construction of poultry houses. Care. Rearing of young.

Improvement of home grounds in city and country. Orderliness and cleanliness the first means. Subsequent improvement and beautification. Varieties of shrubs and trees best suited for the region. Arbor Day. Planting of trees and shrubs in the home grounds. Civic improvement.

Herewith is a small list of books which are recommended to the teacher for her help in the selection and use of material, and to give her essential facts and principles. These books are not recommended for use as textbooks, but more as references for the teacher. They should supplement the knowledge gained by actual observation and practical experience. The teacher is also urged to make use of the publications of the U. S. Department of Agriculture, and those of the Colorado Experiment Station. These are of great value.

Bailey, L. H.—The State and the Farmer, The Macmillan Co.	\$1.00
Bailey, L. H.—The Principles of Agriculture, The Macmillan Co.	1.25
Bailey, L. H.—The Garden Manual, The Macmillan Co.	2.00
Bailey, L. H.—Botany, The Macmillan Co.	1.10
Bailey, L. H.—The Nature Study Idea, Doubleday, Page & Co.	1.00
Hornady—American Natural History, Scribners..	3.50
Chapman, F. M.—Bird Life, Appleton & Co.	1.75
Comstock—Insect Life, Appleton & Co.	1.25
Coulter & Nelson—Manual of Rocky Mountain Botany, American Book Co.	2.50
Roberts, I. B.—The Fertility of the Land, The Macmillan Co.	1.25

The Greeley Republican Print