

BULLETIN  
FIRST DISTRICT NORMAL SCHOOL  
KIRKSVILLE, MISSOURI.

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Vol. V.      September, 1905.      No. 2.

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PUBLISHED BY THE FIRST DISTRICT NORMAL SCHOOL

Issued Quarterly--June, September, December, March. Entered June 25, 1902, at Kirksville, Mo., as second-class matter under act of Congress of July 16, 1894.



# Ways and Means of Fitting Education for Agriculture into the School Curriculum.

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Address of President John R. Kirk at Convocation of University of New York,  
Albany, N. Y., June 30, 1905

When this subject was assigned to your present speaker it was suggested that he show how to introduce Agriculture into the curriculum "with benefit to the school and no injury to the curriculum." The suggestion seems natural. It should, doubtless, occur to any alert and practical man. The speaker, however, was inclined to ask, "How can the large, healthy foot of an average man be fitted into a narrow shoe with benefit to the man and no injury to the shoe;" or "How can the full round head of a large brained child be fitted into a small stiff hat with benefit to the child and no injury to the hat?" The further thought occurs that feet and brains are essential parts of an organic whole while shoes and hats are useful conventionalities which ought to be so made as to be adapted to feet and brains.

For a decade or more we have been enriching the curriculum. Some are worried because of our extravagant use of fertilizers; but we shall keep on enriching and re-organizing the curriculum. Some good people would center all our energies on the old question of fundamentals. But who knows what is fundamental and what is secondary and subordinate?

A few years ago the colleges and high schools had no chairs of English. Then we exemplified our primitive conceptions by using the clumsy phrases "Supplementary Read-

ing" and "Literature in the Grades." Reading was largely a mechanical process. At best it was said to be acquiring through mechanisms the thoughts of others. Now we know better; we see more clearly. Prior to Reading we master certain conventionalities through charts and other facilities. By practice, the use of the conventionalities is passed over into the automatic. *Reading* has become *thinking*. It always *was* thinking. It is the personal interpretation, appreciation and assimilation of Literature. It is not getting the thought of the author. Reading, hearing and observing mean that we are having thoughts of our own aroused in our consciousness through external stimuli, visible, audible and tangible things of the earth. Look back a few years. How we did worry about over-loading the curriculum with Literature, Vocal Music, Art, Manual Training, Domestic Science, Gymnasium Work; and how many of us thought the curriculum would be irreparably injured. But now we have all these things in the curriculum. They are, to say the least, as essential as those mechanisms, the 3 R's, so erroneously looked upon as the fundamentals; and the curriculum still survives.

But now another new study commands our attention. It is conceded that all children ought to know more about Nature and natural forces than the curriculum now provides for. To meet this want we now attempt to introduce the essentials of Agriculture into the curriculum.

We are obliged to re-cast some definitions. We have long endured unprofitable contention over two alleged phases of school education, i. e., education for culture and education for utility, the classics being *supposedly* for culture; the Sciences and some other subjects, for utility. We now see that the Classics are as much for utility as they are for culture and that the Sciences are as much for culture as they are for

utility, that every legitimate subject of study is for both utility and culture. Education in Agriculture is an essential utility because it is the only means of furnishing adequate conceptions of the fundamental occupation of mankind upon which all other occupations now depend and forever must depend; but education in Agriculture is also a basis of true culture and refinement, as illustrated in some of its earliest fruitages which we recognize in the adornment of homes and schools, through improved lawns, shade trees, walks, driveways, gardens and flowers. These things open the avenues to consciousness and reveal to us the beauty world which lies about us. Agriculture in the public schools has a three-fold value—aesthetical, educational, utilitarian. All these values are discovered and appreciated through the many exercises actually performed by the students themselves. The speaker wishes he could take you some December day to the Assembly Room of a large Normal School or Normal College which has Agricultural laboratories and a school garden. As students and visitors assemble daily at 10:00 a. m. to sing songs, hear announcements, say good morning, shake hands and go again to their several class rooms, a common uplift is felt by the whole mass of men and women as the eyes are opened to a half dozen beautiful jardinières loaded with perfume bearing flowers; but the flowers are not bought at a green house. The students know where the flowers come from and how the flowers grow. Among the students are those who, directed by scholarly instructors, sowed the seeds or potted the flower bearing bulbs, watched and tended the plants from germination to the flowering stage and through weeks and months of study, observation and care, grew familiar with the relation existing between seeds, soil, sunshine, moisture, etc., on the one hand, and these flowers, the admiration of all, on the other.

How introduce Agriculture into the curriculum? A prac-

tical statesman well known to all of you once said the way to resume was to resume. So some of us in the middle West introduce Agriculture into the curriculum with benefit to the school and without injury to the curriculum by simply making the introduction. We just place Agriculture in the curriculum. We give it a fair share of time, equipment, labor and thought. We are unable to discover any resulting retardation in any other subject. We notice that the children are more observant, more alert. They see more things. They have more conceptions of realities. They have an enlarged vocabulary. We modify the treatment of Geography and combine Agriculture with it. We treat Literature and Agriculture in the same way. Literature furnishes children more food for thought and a better variety of thought illustrations. Agriculture furnishes the children more food for thought and a larger variety of concrete material for all purposes.

In lieu of one school reader filled with fragments of Literature, all of the best schools have introduced an abundance of undissected and undamaged master pieces. We have quit using that cumbersome evidence of ignorance, the phrase "Supplementary Reading." We have learned much by experience. We therefore seek to avoid introducing Agriculture into the curriculum for exploitation by people whose knowledge is merely fragmentary. Children can learn Literature fairly well by reading it if the teacher be ever so ignorant. Not so with Agriculture. Not so with Nature Study which is commonly a misnomer and too often means reading things about Nature and repeating statements about Nature without studying anything that is natural and without observing scientific modes of procedure. First of all then, a supply of *teachers must be educated in Agriculture*. I think our higher institutions ought to furnish the means of doing this. All

Universities, all Normal Schools and most of the large colleges ought to contribute something.

The most valuable investigation, discovery and thought in Agriculture, as in other subjects, is carried on in the Universities, but the Universities as they are now organized can contribute comparatively little towards introducing Agriculture into the curriculum. They reach the schools only in spots. The institutions that educate and train the rank and file of public school teachers are the ones best adapted to leadership in the introduction of Agriculture.

The Normal Schools can do this great work just as they are able to do the larger part of the work of educating teachers to organize and conduct libraries. The full fledged up-to-date Normal School now gives courses in Library Work, which require as much labor in preparation as is required in the preparation for Science or Language, or any other subject. Likewise the Normal schools are to do the larger part of preparing teachers of Agriculture for the public schools. The University and the experiment station carry on the investigation. Theirs is chiefly the field of research. They can prepare a few teachers who will assist in the introduction of Agriculture into the public schools. Some of the well equipped colleges will pretty soon be offering courses in Library Work. Gradually they will secure laboratories and give adequate instruction in Agriculture. They have the alternative of doing this or taking a side track while the car of education advances. Some of the colleges now offering courses in Agriculture, are lacking in equipment and library facilities. They therefore rely too much upon text books and cannot provide reliable teachers of Agriculture.

The high grade Normal School furnishes teachers for all public schools—high schools, elementary schools and kinder-

gartens. The best Normal Schools or Normal Colleges of the middle West offer academic courses covering all that the high school gives and all that the college can give. The typical high school graduate has little more than the child's view of subject matter. To take him into the Normal School and give him a few shallow dips into Botany or Agriculture or any other Science and to give him, along with these, large and unbroken doses of Pedagogy or Methods, is to live and labor in the shallows.

The ordinary view of education is superficial. It is to the effect that partially educated people can be filled with such prescriptions, recipes and devices as a typical Normal School in static condition can give and then entrusted with the work of instruction in elementary schools, while the secondary teachers must have both high school and college education not necessarily supplemented by professional training. This vicious and deplorable conception is far too common. The high grade Normal School of the middle West guarantees that its graduates have that knowledge and that view point of academic subjects which college graduates are supposed to have. It furnishes also adequate conceptions and experiences in Pedagogics and then sends out *strong personalities* who are independent of prescriptions, recipes and devices and who construct ways and methods of their own because they have large information and minds regulated by diversified experiences. Such Normal Schools are based on the idea that the third grade child and the seventh grade child need as scholarly teachers as the high school child.

The school which the speaker represents is typical of one division of Normal Schools in the middle West. Forty-seven per cent of its students are men, full grown men. This school gives long and severe courses in several Sciences. It

allows no credit or recognition for piece-meal work in Science; no credit or recognition for merely reciting text book lore about Science. No student is authorized to study a Science unless he takes it with the intention of pursuing it in the laboratories by laboratory methods for a period of not less than one year; but to educate a teacher of Agriculture in one year's time is pretty nearly impossible. We do not believe that all teachers should prepare to teach Agriculture or that all teachers should study it. We do not believe that all teachers can learn to teach Mathematics. There are a few people who can teach well subjects of nearly all kinds; but as a rule they do not have very extensive knowledge of any subject. Gradually we expect to secure consolidated rural schools in which a measure of specialization will carry each school to higher efficiency. In many places we are making beginnings. The Normal Schools of Missouri have laboratories and Science teachers sufficient to give two years of laboratory work and study in Physics, two in Chemistry, two in Zoology, one in Botany, one in Agriculture and one in Physiography. We are not free from superficiality. We allow some students without previous training in any Science to begin the study of Agriculture and pursue it for nine months and then go away and undertake to teach the subject. They enter village and rural schools and do what they can. They designate the subject, sometimes as Agriculture, sometimes as Nature Study. No doubt they do much bungling, but they probably make as good a start in this subject as their predecessors did in Civics when that subject was new. In no event is their empiricism worse than that now exhibited both east and west in teaching "Human Physiology" in elementary schools. When the subject takes the name "Nature Study" it is sometimes discouragingly ill-organized and badly taught, a sort of hodge-podge.

But our elementary and high school teachers of the middle West, at least, are now teaching Literature pretty well. A dozen years ago most of them were teaching Literature in a very desultory way or not at all. We are therefore not without hope as to Agriculture.

In the Missouri Normal Schools our students are encouraged to have at least Biology and Chemistry in connection with Agriculture. If possible we prefer to give the Biology and Chemistry before the Agriculture. When we can have as a basis the Biological and Chemical courses through laboratory processes, we can give the courses in the Agricultural laboratory and the School Garden to much better effect. It should be understood that when we speak of laboratories we mean those in which the students perform all sorts of individual experiments; but a laboratory which is not associated with a library and pretty good text books is an abnormality only a little better than a collection of Science text books without any laboratory. The typical farmer represents a laboratory without books and without good instruction. *True science is through instruction and experiment.* Through experiments the mind is prepared to appreciate the accumulated knowledge of the race.

It might be asked, how do patrons view Agricultural courses? In some communities they are not yet ready to permit the teaching of Agriculture. Stoical incredulity is in places practically insuperable, at least for the present; but the superficial hurried courses in farmers' institutes, the bulletins from the universities and experiment stations, the Agricultural journals and endless discussions, all contribute to the making of sentiment. I think a majority of the schools, academies and colleges offering instruction in Agriculture are yet giving the instruction in a rather superficial way. Bail-

ey's Agriculture and other hastily written books are commonly used. Much of worthless memoriter work is done; but sentiment is improving. It is probable that the people will become anxious for proper instruction faster than schools and colleges can prepare teachers to give the instruction.

I think it is not irrelevant, in passing, to ask how we first taught Physics and other Sciences? In New York you may have begun by rational laboratory methods but I am not so informed. In the middle West we began by learning things from books. When the speaker had studied Tenney's Zoology about six months he could pass a far better examination in Zoology than he has been able to pass at any later time.

There is a pretty general misconception as to the real purpose of education in Agriculture. The heading of this paper does not serve to make our purpose any clearer. A market gardener recently drove past the school garden of a Missouri Normal School. He saw the Science teacher working with some children in the garden. He said to me: "She ain't a doin' no good for herself nor anybody else workin' in that little patch with her school kids." "She couldn't get two crops from one patch o' ground like I do."

However, that teacher of Agriculture had just given a group of farmers a practical lesson in clover raising and rotation of crops which they acknowledged to be worth hundreds of dollars to them; and yet our instruction in Agriculture and our laboratories and school garden are not altogether for strictly practical purposes as the market gardener and the farmer would expect.

The course in Agriculture is chiefly for education. It is to open the avenues to the soul so that external stimuli of a thousand varieties may reach the soul. Shakespeare, to illustrate, had no school education in Agriculture. His father

could neither read nor write, but the external stimuli, the vast variety of odors, colors, forms and sounds, found avenues to his consciousness. He thought more than other men and wrote better than other men because Stratford-on-Avon and Warwick and Kenilworth and the dark forest and all that beautiful country found avenues to his consciousness in ten thousand ways, and he spoke of things *as they spoke to him*. So we, through the endless agencies of an Agricultural course, seek to open the avenues to the consciousness of the children and give them the power of observation, i. e., of seeing things in their minds after physical impression has been made upon the eye or the ear or other senses. Observation is thinking.

We give children experiments to perform in the laboratory and in the school garden. We teach them to make observations and to do things. We give opportunity for reading, cogitation and reflection. We stimulate their constructive ingenuity. We make of them doers of things and builders of things. We do not fill them with rules and prescriptions for doing certain things in certain ways. We are not teaching recipes for sowing radishes or planting fruit trees. Rules and recipes are at best only incidental to our purpose. We are not expecting to make the children imitators in gardening and farming any more than we make them imitators in Composition, in letter writing, in number work or other studies. But we *are* undertaking to make them intelligently familiar with the big round world that they live on. We see Agriculture and Geography as necessary and connected parts of one fundamental subject.

What have we to work with? Full grown men and women, 25 years of age, typical students of the Normal School and the six-to-sixteen-year-old children in the Practice School work

with nearly the same materials. The Practice School typifies the public school and is equipped as a public school should be equipped. Our laboratories are ample in size and well supplied with microscopes, herbarium cases, book cases, reference books, dictionaries, maps, charts, ordinary Biological tools, cutting tables, milk testers, soil tubes, test tubes, hoes, rakes, hatchets, knives, etc. These are in use all the year round. The garden, of course, is in use only in spring, summer and fall.

Some of the subjects taught by instruction and by experimentation are as follows: Differences between types of soils and kinds of plants, the importance of drainage; methods of tillage for conserving soil moisture and effecting soil ventilation; keeping plant foods in the soil by cover crops and by preventing exhaustion of food elements through rotation of crops; principles of feeding; how to care for milk and test its qualities; propagation of plants by seeds and bulbs; grafting and transplanting; the principles and effects of pruning for fruit, for shade and for ornamental purposes; discrimination between the insect friends and the insect enemies of plants; the making and use of insecticides; elementary landscape gardening whereby homes, school grounds and other premises are transformed and beautified. As concrete illustrations I may mention the following: Monday, June 26, at 10:00, a. m., I started from my office to the school garden; passing the Agricultural laboratories I met a dozen fourth grade children coming in from the garden. These children were tripping along with rakes, hoes, etc., each one carrying a large bunch of sweet peas which had just been gathered at the close of the garden exercise. Some children of another class were still in the garden. One girl was gathering nasturtiums from a bed which she herself had planted and tend-

ed. I noticed on the right a long row of sweet pea vines about four feet high, loaded with flowers, and in the garden at large I could readily notice plants and flowers representing all the vegetation growing in the neighboring farms, gardens and orchards. In one part of the garden are 32 individual gardens. These individual gardens are only a few feet each way in extent. In individual garden No. 1, I noticed: 1. Onions; 2. Beets; 3. Cabbages; 4. Potatoes; 5. Corn; 6. Beans; 7. A radish bed, the radishes having been matured and gathered and the ground replanted in beans; 8. An onion bed, the onions having been matured and gathered, excepting one which was left for seed. No two of the individual gardens were exactly alike. I found several individual gardens that were both flower gardens and vegetable gardens. One of them contained the following: 1. Nasturtiums in bloom; 2. Phlox in bloom; 3. California poppies; 4. Zinnia; 5. Aster; 6. Cosmos; 7. Chinese pink; 8. Gladiolus; 9. Onions; 10. Beets; 11. Radishes; 12. A lettuce bed; 13. Tomato vines beginning to bear. The children work in this garden from one to three periods per week. This follows instruction in a class room or lecture room and experiments in the laboratories. But time permits the mention of only these few items as illustrations.

By use of Agriculture we hope not only to further enrich the curriculum but to strengthen it as a whole and bring its elements into unity.

Through rational use of all elemental subjects we hope to appeal to the apperception masses in the minds of all children and bring more of the curriculum within the comprehension of the children.

We do not seek to make any work easier but to make all

work more enjoyable. We do not seek or hope to teach all things to all children. We do not desire to produce greater homogeneity but rather to bring about greater heterogeneity through that wholesome differentiation which comes from offering food for all types of mind.

The child is born a worker. He loves work till school and home make him an idler. We here offer another stimulus to work, invigorating work that makes play worth playing and life worth living.

