## Teachers for Country Schools.

In a recent article on the teaching of agriculture in the public schools, we named as one of the obstacles, the lack of qualified teachers. That is one of the greatest flaws in our present district school system and is the chief cause of what some of the older generation call "the decay of our common schools" though it is the natural result of changed conditions.

Our New England fathers and mothers tell us that in the days of their youth "teaching country school" was a more honored calling than it is today. Money was scarce then and the number of occupations outside or farming was limited. The compensation was not large, less than half the sum peid in most country districts now, but a dollar then meant more and went further. The farms of sixty and seventy years ago were little independencies whereon raw materials were manufactured into foods and fabrics for home consumption, the surplus being converted into the cash needed for taxes, postage, and a few other necessary incidentals.

The student at that time felt he had a special claim on the country school and his lien was generally allowed. By its help the poor boy was able to struggle through college. The school of course profited by conditions that brought to its doors as instructors the brightest, most ambitious young men in the community whose wits had been sharpened by college associations, and the fact that they were themselves enthuslastic students lent a zest and originality to their teaching that the mechanical methods of normal schools are not able to impart. With no grades to interfere, the work could be adjusted to the relative capacities of the scholars; the bright students were pushed forward at a smart pace and the dull ones were not unduly hurried Many a man today whose memory runs back to one of those New England schools, attributes whatever measure of success he has achieved to the stimulating influence of one or more of those student teachers.

Times have changed vastly since those days of simple living and high ideals, and though by far the largest stream by which our colleges are fed still comes from the farms, the country school no longer tempts the student with the lean purse because there are many other avenues of temporary employment open to him that pay better. The country school las therefore become the special spoil in many places, of the undeveloped girl who has graduated from the grammar school of the rearest town with enough knowledge to enable her to procure a second grade certificate. She seldom has aspirations for a higher education but rather resorts to teaching as a temporary makeshift by which to provide herself with wedding finery or pocket

Sometimes, it is true, the budding teacher who plans to make it a profession, tries her "prentice hand" on the country school, but there are no inducements to stay, and as soon as she can secure a position in a town school where her salary will be larger, where the work is organized, and her responsibility is lessened, the small rural school house knows her no more.

Under such a series of indifferent and transient instructors it is small wonder if the country school has declined, and there seems little hope of bettering it until it can be made to pay enough to secure the services of talented men and women who teach in the true sense of the word and who are willing to make it a profession. Legislators have begun to realize that so long as the schools are scattered through farming districts for the convenience of a handful of scholars. there is little hope of elevating the grade of instructors, and out of this conviction has come the effort to consolidate country schools. Wherever tried it has been found satisfactory. The plan certainly has much to recommend it. First, economy: one good building can be erected and well equipped for less than it costs to build the isolated little school houses forlorn and neglected that mark the crossings of section line roads, not to mention the saving in the cost of repairs and the money invested in school lots. True, the transportation of pupils must be provided for, but that is neither a difficult nor expensive matter in rural districts where horses are numerous and (in the winter) idle for the most part. Concentration encourages a better school organization, cuts down the number of teachers required and enables the districts thus combined to pay salaries that will command ability.

We look to see these consolidated schools take the place, to a certain extent of the late lamented New England Academy, which was such a feeder for the colleges, for we feel sure they will as irresistibly attract the ambitious boys and girls within the sphere of their influence.

In such schools the teaching of agriculture may yet be made a practical offer new openings to the graduates he has had experience in the matter. of our agricultural colleges who should be specially fitted for such lines of work. They more than all others should be able to show the relationship of agriculture to other branches creases the yield of eggs, and the quanof knowledge, and above all, they should be capable of arousing enthuslasm for their specialty. With such guides our children would be led into the fields instead of away from them. They would learn to feel a more intelligent and practical interest in the tillage of the soil and we would need fewer recipes for keeping boys on the

Seeding to Grass. '10 the Farmers' Review :- It may seem strange to some readers, but it is true that hundreds of farmers believe that grass and clover must be sown among wheat, oats, barley or some similar crop in order to obtain a stand. The grain, they say, acts as a nurse to the young grass or clover, and they must get a better catch, also that these plants protect the weak little fellows from the heat of the sun. This has no foundation in fact. Clover and grass are not affected by the heat or sunlight any more than grains at the same stage of development. In fact, to obtain heaviest yields it will be found best practice to sow separately, especially in dry climates and seasons where the moisture supply is likely to prove insufficient for either crop. When the season is dry, instead of acting as a nurse, as is claimed, the grain is the very worst of robbers. It is older, stronger, more deeply rooted and thus better able to obtain the moisture in the soil, thus preventing the weaker plants among it from getting their share.

Sown separately upon well-prepared arable soil, both clover and grass will germinate well, make quick growth, often bear seed heads the first season, and if soil and cultural conditions he favorable, a good crop of hay may frequently be harvested. Weeds that get a start may be moved down; the smaller ones will soon be smothered out if the seeding be heavy. For this mowing the cutter bar should be set to cut about six inches high.

M. G. KAINS.

Steam Plowing.

We notice that one writer on agricultural subjects says that steam tillage may be advantageously adopted by wealthy farmers, and he enumerates some of its advantages. The verdict, however, of thirty years' trial has indicated that the place for the steam plow has not yet been found. Electrical arrangements may be made that will give good results in tillage, but the steam plow and the cultivator lack the one great essential to make them successful—the ability to economize power. The steam plow, or, rather, plowing machine, must use a large per cent of its energy getting over the ground, and this expense of force increases as the softness of the ground increases. So great is this obstacle that some of the manufacturers of these machines have built wooden walks that were carried by the engines, and had to be placed before the machines whenever they were working in any but the hardest fields. No implement can succeed in our agriculture that cannot show a margin of profit for its use over ordinary tools and methods. At present the margin of profit is in favor of the tools and methods we now have. It was found by the inventors of steam plowing machines that the cost of providing water for the making of steam was even of more consequence than the furnishing of fuel. When we consider that much of the work of farm implements has to be done on lands that are deficient in water supply, we can imagine something of the cost of providing enough water to develop force enough to plow a hundred-acre field.

Barnyard and Chemical Manure. It has been reported, and doubtless correctly, that the gardeners near the big cities find that there is a limit to the use of chemical manures, but that by putting on more barnyard manure the soil is able to give good results from an increased application of chemical manures. While this should be borne in mind by every man that is using large quantities of commercial fertilizers, it also involves a principle that affects us in all branches of farming. That principle is that the chemical effect of the barnyard manure is of value. The acids that are set loose operate on the insoluble plant food in the soil and make it soluble. Barnyard manure in undergoing decomposition, liberates corbonic acid, and this takes hold of the soil elements and sets loose plant food. The value of the barnyard manure cannot, therefore, be told by figuring out the commercial value or cost of the elements it contains. Thus, a ton of barnyard manure might show up so many pounds of each of the constituents, and this might be supposed of the same value as chemicals in their ordinary or commercial form. The barnyard manure, however, possesses the power of decomposition, which process is of direct value to the soil. This fact makes it the more advisable to apply manure fresh, that its decomposition may go on in the land, and thus the soil and plants get the full benefit of the process.

Blue Grass. From Farmers' Review: I am frequently asked about what I know of the methods of starting bluegrass. In these ends it is now never sown. It is the one grass universally present. If we reap it, it is where we have not sown; or if we gather it, it is where we have not strewed. But men do come from abroad to gather and thrash it. A neighbor whom I questioned, he being an Eastern man, said four quarts feature. Viewed in this light they will of seed to the acre is about right, and It is without doubt the best pasture grass in the world. It fattens, and stock never get tired of it. Poultry and hogs are fond of it, and it intity of lard. In those places in the fields where it has been suffered to grow all the season, horses and cattle pasture on it nor will they leave it for the best of hay, unless it be wellcured clover, brown as a berry. The poorest excuse for pasture with us, and as hay, is redtop. Quackgrass is superior to it. However, it is not a persistent grass in these parts; it is found only now and then in some draw

which is liable to wash. EDWARD B. HEATON.

## Adaptablity of Soils.

The Michigan Experiment Station has been giving some attention to soil analyses, and publishes the results. Analyses are given on soils adapted to grain growing, fruit raising and potato growing. The average of nine analyses of fruit soils gave the follow-

Lime ...... 1.68 Magnesia ..... Other elements not active in plant

case in all of the tables. Fruit Soils,-While the wheat soils will raise good fruit and produce hardy trees, there are soils especially adapted to raising fruits, especially peaches and other stone fruits. The analyses of nine such soils in widely separated localities gives the following average

growth are left out, and this is the

composition: Per cent. Lime ..... 1.15 Potash ..... 1.35 Sand and insoluble silicates. . \$3.75

Potato Soils,-A third class of soils might be described as gravelly or sandy loams, constituting the soils so celebrated for raising potatoes of excellent quality and hence called "potato soils." They will also raise many other crops, and might be named "potato and general utility soils." The average composition of nine soils of this class was as follows:

Per cent. Magnesia ..... 
 Potash
 1.12

 Phosphoric acid
 .22

 Sand and insoluble silicates
 .90.02

Light Soils .- There is a fourth class of soils, characterized by a large excess of sand, open and porous, in many cases easily drifted by the wind, the grass growing in bunches instead of an even sward, and the vegetation generally of a light character. The jack pine plains of northern Michigan are good examples. Seven samples of such sandy soil gave this average composition:

Per cent. 

We will denominate these four soils as wheat, fruit, potato and sand and we have the following as the elements present:

Lime.-Wheat, 1.68; fruit, 1.15; potato, .93; sand, .31. Magnesia.-Wheat, .54; fruit, .51; po-

tato, .38; sand, .17. Potash.-Wheat, 1.48; fruit, 1.35;

potash, 1.12; sand .42. Phosphoric acid.-Wheat, .38; fruit,

26; potato, .22; sand, .09. Sand and Silicates,-Wheat, 70.43: fruit, 83.75; potato, 90.2; sand, 92.66. One is struck with the steady increase of sand and decrease of the essential elements of plant food. The average of the phosphoric acid is less an acre of soil, taken to the depth of one foot would weigh 4,000,000 pounds. If such soil holds only one-fifth of one per cent of phosphoric acid, an acre one foot deep would contain 8.000 pounds, or enough for 350 crops of wheat with the straw. The latest fertility is, however, not all in a state that makes it possible to use it, or even any considerable part of it at one

Wisconsin Dai y Convention.

to set loose the plant food.

time. Constant working is necessary

(Condensed from Farmers' Review Stenographic Report.) The twenty-eighth annual convention of the Wisconsin Dairymen's Association was held at Watertown Feb. 13 to 16. It was in this place twentyseven years ago that the association was organized with seven members. The attendance was good, and the interest was all that could be desired. President Taylor, in his annual address, pointed out the fact that the association had been of great value in stimulating new efforts in dairy lines. The improvement in the quality of cheese alone is worth \$100,000 per year to the cow owners of Wisconsin.

Prof. Woll spoke of Danish dairy farming, and showed how since 1872 the whole system of farming there had been changed from grain raising to butter production, added to the making of bacon and the production of eggs. Since the year 1865 the net exports had increased from 8,790,000 Danish pounds to 110,080,000 pounds in 1899. The export of eggs had increased by six times. He said that the exhibits of butter under control of the government had been the source of much of the advancement in dairy methods. He described Danish butter as naturally containing an excessive amount of water as compared to American butter, and said this was one problem with which the Danish butter-maker had to contend, as England has laws prohibit: ing the sale of butter containing more than 16 per cent of water.

U. S. Baer, one of the state cheese instructors, gave a report of his work in the cheese factories of the state, and told of the enlargement of the scope of the work in that line at Madison. In addition to instruction in making cheddar and American cheeses, the students are taught to raile Swiss and Limburger cheese,

C. P. Goodrich spoke on how to breed a dairy herd. He told of his own mistakes in breeding, and cautioned the farmers against attempting to breed away from established types. He said that one of his mistakes was breading in Short-horn blood and buying cows that had Short-horn blood in them. He had finally to get rid of this kind of cows. Buying cows he fourd was instead of milk cows.

not a good way to get a first-class herd, and he succeeded best when he stopped buying and went to raising his own dairy cows, carefully selecting their parents.

One of the most interesting papers during the entire convention was that of Mrs. Adda F. Howle, who is owner of a fine herd of Jerseys at Elm Grove, near Milwaukee. Her topic was "One Way to Develop a Dairy Cow," and in the handling of it Mrs. Howie made a remarkable impression on the audience. It was one of the most stirring addresses of its kind that can be imagined. We predict that this lady will become one of the recognized leaders of American dairy thought. The development of the dairy cow, according to this speaker, is the result of careful handling. Her early habits must be carefully formed, for they will control to a great extent the habits of a lifetime.

James H. Beirne spoke on the handling and feeding of dairy cows. His words had weight from the fact that some of his cows have produced over 900 pounds of butter in twelve months. He keeps his cows in the barn during the cold weather, and keeps them blanketed most of the time. His methods of feeding are in accord with the highest authorities on dairy subjects.

H. C. Adams spoke to some length on the present status of oleomargarine. He said that much of the oleomargarine consumed in Wisconsin is used in the logging camps, where it is bought as oleomargarine and served to the men as oleomargarine; but in the cities the stuff is bought by the wholesalers and retailers as oleomargarine and sold to the people as butter. It is this kind of sale that the dairymen protest against. They have no objections to its being sold and used when sold and used under its own name.

Prof. E. H. Farrington spoke on Who Should Use the Babcock Test, and Why?" He said that it is now difficult to find a creamery in the civilized world that does not buy its butterfat by the Babcock test. If there is a single creamery in Wisconsin that still buys by the old pooling plan, it should be reported so that it can be visited as a curiosity. Every farmor that has a few cows should invest in a Babcock tester, and the money thus spent will prove the best investment that can be made. He quoted the statement of Prof. Henry to the effect that the little savings brought about by the Babcock test are worth to the farmers of Wisconsin annually more than \$800,-

E. C. Bennett of Iowa spoke on watering the dairy cow, and told of his own arrangements for that purpose. He considers the giving of too cold water as one of the first causes of failure in dairy management.

Prof. T. L. Haecker of Minnesota spoke on feeding the dairy cow for profit. He went into some of his elaborate experiments in the feeding of different rations, and expressed the belief that the cow wants a uniform ration through the whole winter, and that milk is lost by sudden changes in the manner of feeding.

Major Alvord of the Department of both on the feeding of silage and on the exhibit to be made at Paris. On feeding sliage he said that he preferred to feed his silage in midsummer, if he had not enough to feed both summer and winter, but that it is best to have enough to feed at both times. He found that cows would eat hay and corn fodder better in the winter than they would in the summer, and that silage fed during the dryest part of the season keeps the cows from falling off in their milk. He then told about the preparations being made to make a dairy exhibit at Paris, and said that the first shipment must be made by the middle of March. Those intending to compete can get full instructions

by writing to the department. W. D. Hoard spoke on the claims of the cow as a mother. He said that he had been talking on this subject for fifteen years, and still very few seem to grasp it. It is the motherhood of the cow that must be considered, and she must have the kind treatment that we accord the mother if she is to do her best.

The Farmers' Review has a stenographic report of the best thought brought out at the meeting, and the material will be given to the readers of this paper as soon as space will permit.

Profit of a Dairy Herd .

W. S. Smith, Zionsville, Ind., a breeder of Jersey cattle and a dairyman who makes butter good enough to hold the trade of an ex-president of the United States, receives 30 cents a pound eight months in the year and 25 cents for four months. He keeps accurate records of his cows' work. One year he milked ten cows, two of them young (second calves), balance in their prime. His receipts for butter sold that year were \$76.20 per cow. No account was taken of the increase, consisting of ten calves; nor was the milk and butter used in a large family, nor skimmilk and buttermilk fed to calves and hogs, figured up.

Mr. Smith now milks from 16 to 22 registered Jerseys. He has studied rations very closely, and come to the conclusion that a mixture of four parts bran and shorts to one part corn meal, makes as good a dairy feed as he has tried. He one time substituted Buffalo gluten for bran, and found it just about as economical; but he found it made his butter too oily and soft, although it increased the milk yield to a remarkable degree.-Jersey Bulletin.

If a creamery is to succeed it must expect to pay a fair price for its milk; otherwise the milk-producers will lose interest and go into raising beef cows | molasses in connection with sugar-beet

## Creamery Butter Making.

(Condensed from Farmers' Review stenographic report of Illinois State Dairymen's convention.)

Grant Mallory spoke on creamery buttermaking. In part he said: In the first place the buttermaker should be the manager of the creamery, that he may have full control of the milk, cream and butter. He should be both keep his machinery in shape and know when things are running all right. Guess work will not do in the creamery; it has ruined many a separator. engine and boiler, and spoiled lots of cream and butter. The buttermaker should be a man of good judgment, quick to think and quick to act in times of emergency. He should have a place for everything and have everything in its place. The buttermaker should be a good judge of human nature, for he has all kinds of people to deal with.

He should know his patrons and should go out among them, tell them how to care for their milk and cans. help them to select good cows, give them good advice in regard to feed and care; show to them that it is to their interest to bring nothing but-the best of milk to the factory; for it is of poor milk.

Now, I will tell you how I make butter: We always try and have a good head of steam, and everything ready early in the morning. When the patron drives up to the weigh room, the milk is weighed in and a test taken. We do not take sour or spoiled milk. The milk in the tempering vat is heated up to 80 or 90 degrees before it is run through the machines. We use a heater to do this and never live steam to heat whole milk, for it injures the flavor of the butter.

We then skim a thick heavy cream and then the cream is cooled down to 54 to 56 degrees as soon as separated and stirred often during the day; it is held and ripened in the vat. We hold our cream 24 hours, and heat it up to about 62 degrees. We use a starter. Of course in the summer we do not heat our cream at all, but cool it down as low as possible. When ready to churn it is cooled

down to 52 degrees, when ft is strained into the churn, color put in and the churning begins. We churn our butter in granules, not into lumps the size of your fist or head. The buttermilk is then drawn off, the churn is filled up with clean cold water, the water being about the same temperature as the buttermilk, the lid is replaced, the churn is revolved a few times, the water is drawn off, and the butter is salted, worked and put up in packages ready to ship. Then the churn is washed and steamed out, and the vats, cans and pipes, and everything about the factory washed and scalded. The floors are scrubbed and everything got in shape for the next day's work.

Q.-What do you use for a starter?

A. Mostly skimmilk. Q .- You spoke of experimenting butter colors; do you intend to advise buttermakers to experiment by trying all the new colors that come along?

A .- No, but it is best to experiment a little with the butter colors you are going to use.

Q .- How do you prepare your start-

A .- I handle my starter mostly as I do my cream. We use a can full of milk and cool it to 54 degrees and then heat it up to 60, 62 or 65 degrees, and by the next morning my starter is ready to use.

Q.-Why do you cool down the skim-

milk? A .- I think that it adds something to the flavor, but do not know that it does.

Q.—How long does the butter lie in the salt before you work it a second time?

A .- I never work it a second time. Q .- In preparing that starter do you stir your buttermilk as you do your cream. A.-Yes.

Q .- How much time elapses after you put your salt in before you put your color in? A .- Only the time required to work

Q.-Do you ever have any trouble with waxy or mottled butter?

A.-No.

Molasses as Food for Animals.

A number of years ago the value of molasses as a feeding stuff for farm animals was studied at several of the stations. The results of these and other experiments have been embodied in a recent bulletin issued by the Department of Agriculture from which we take the following: It is a common practice to feed molasses to stock in regions where sugar is manufactured. The molasses is usually mixed with some other material which absorbs it so that it may be readily handled. At the Texas station molasses was advantageously introduced into a ration of cotton-seed meal and cotton-seed hulls for cattle. The use of half a pint of molasses for each daily ration resulted in the profitable consumption of a larger amount of food by cattle. It did not improve a ration consisting largely of silage.

The Maryland station reported a fattening experiment with steers in which molasses was added to a ration consisting of corn meal, cotton-seed meal, bay, and rye straw. No conclusions were drawn as to the effect of molasses, although the test as a whole gave satisfactory results.

Many of the stations have analyzed

view to determine the presence adulterants.

Within the last few years much attention has been given to the value of molasses as a feeding stuff by foreign stations. In view of the efforts to extend the manufacture of beet sugar in the United States these experiments are interesting, since the profitable utilization of by-products is a matter

of great importance. Cane-sugar molasses obtained under average conditions which prevailed in an engineer and a machinist, so as to this country a few years ago had approximately the following composition: Water, ash, and organic matter other than sugar, 49.4 per cent; came sugar, 30 per cent; reducing sugar, 23 per cent. The molasses produced today at a well-equipped small factory, working economically, contains on an average 20 per cent cane sugar and 20.5 per cent reducing sugar. That made at the best of the large central establishments contains approximately 20 per cent cane sugar and 25 per cent reducing sugar (glucose). The percentage composition of beet molasses is, approximately, water, 20.5; organic matter other than sugar, 22; cane sugar, 47.5; reducing sugar, 5; ash, 9.5. It will be noticed that the cane sugar molasses contains much more reducing sugar than that obtained from sugar beets. The cane sugar and reducing sugar together make up a large part impossible to make good butter out of the material commonly called nitrogen-free extract (carbohydrates) in food analyses. The reducing sugars have less sweetening power than cane sugar.

As pointed out in the Canadian Experimental Farms reports, one-half of the ash of beet-sugar molasses is pot-

It is the presence of this, no doubt, that is the cause of the looseness of the bowels of cattle fed above a certain quantity per diem. When symptoms of this condition are observed, the quantity of molasses fed should be reduced. Since potash is not retained by the animal, but is eliminated by the kidneys, the urine will be especially rich in this element, and therefore should be carefully preserved by the use of absorbent bedding.

In Europe a number of "molasses feeds" have been proposed. One of these, which has been used to a considerable extent, is made up of bran 4 parts, molasses 3 parts, and palmnut cake 1 part. Molasses is also mixed with dried blood, with peat, and with extracted beet pulp. The latter mixture is dried, and possesses good keeping qualities.

Tall Oat Grass.

This is called scientifically Arrhenatherum elatius. Introduced was from Europe, where it is one of the most valuable species for both hay and pasture. It is so highly prized in Europe that it has been planted repeatedly in all parts of the United States, and with widely varying results. In most cases it has been more successful in the north than in the south. It has been highly recommended for Tennessee, northern Alabama, Georgia and North Carolina, but that seems to be



about the southern limit of profitable cultivation. Further south it is so weakened by the long summers that after a few years it is crowded out by other species. It grows best on a light and rather dry loam, makes its best growth early in the season, and is easily cured for hay. It does not cover the ground well when sown alone, and for either hay or pasture should be mixed with orchard grass, perennial rye, red clover, or some other plant that will occupy the ground more fully.

There seems to be among people not engaged in dairying a growing prejudice against the movements to compel oleomargarine to sail under its own colors. Some are asserting that the dairymen want to destroy all competition so they may have a monopoly of the market for their butter. This is in no wise the case. The dairymen want to be able to sell their product for just what it is, without having any bogus article placed beside it called the same thing and sold for a cent cheaper to catch the trade. The butter maker is willing that oleomargarine should be sold side by side with his butter provided it is honestly labeled oleomargarine and sold for ten or fifteen cents less, according to its true value. This is easily seen to be in favor of the buyer. It is astonishing that any purchaser should want to pay 25 cents for oleomargarine out of a butter tub when he can buy the same from a package marked oleoor sugar-cans investigations, or with a | margarine at 15 cents per pound.