crude, cheap products; mix them with brain and muscle and sell at these advanced prices?

If we take some other products, as cotton-seed meal, the showing will be still better. There is not the slighest doubt that the surest and cheapest way to profitably improve poor land is to seed it down even with weeds of the less harmful sort, if it will not grow grass at first, and then supplement the pasture with other food.

The following rations were fed to cows averaging 1,192 pounds with the following results:

Dampen and mix—
Clover hay, 13 5 pounds.
Cut cornstalks, 4.5 pounds.
Cotton-seed meal, 5.0 pounds.
Corn meal, 4 6 pounds.
Malt sprouts, 4.6 pounds.

Each cow drank 83⅓ pounds of water and gave 31⅔ pounds of milk per day. It was found by feeding the above rations that each cow produced 89½ pounds of solid and liquid droppings per day. An analysis showed that this manure—computed at the manurial value of 1884—was worth 16 2 9 cents.

In conducting some experiments this winter to determine the effect of giving warm water to cows it was found that six cows in thirteen days produced 7,847 pounds of manure or an average of 100 pounds per cow and day. Computing this at $3.05 per ton the lowest value yet found in manure analyzed at our station we found that each cow produced manure to the value of 15 cents per day. Incidental it may be of interest to know that the cows which had warm water ate 14 per cent. less hay than those that had cold water. The manure from liberally fed cows or horses may be safely estimated as worth $15 per hundred. Numerous experiments conducted during the last three years on the University farm show conclusively that clover is one of the best fertilizing factors the farmer has. Our first investigation gave 3,295 pounds of second growth air-dried hay per acre and 4,893 pounds of air-dried roots per acre. An analysis showed that the nitrogen potash, phosphoric acid computed at 15, 4 and 6 cents respectively per pound, had a commercial value of $16.06 per acre. The same computation made the value of the roots as a fertilizer $18.83 per acre. This clover was but one year old and had produced a very heavy crop of hay in June. Some investigations by Mr. A. M. Breed in 1885 gave the following results:

Air dried tops, 5,417 lbs. per acre.
Air dried roots, 2,368 lbs. per acre.

The value of the nitrogen, etc., in the roots and tops gave on analysis a value of $30.10 per acre. I can see no reason why plant food produced from clover tops and roots should be of less value per pound than that furnished in commercial fertilizer. The nitrogen is certainly as soluable, though the phosphoric acid may not be. The last named experiment was conducted late in the fall and the clover was of two years' standing.

A few words as to what is best to sell from the farm and what is best to retain may not be out of place.

One thousand pounds of flour carries off in round numbers from the farm, $2.90 worth of nitrogen, 25 cents worth of phosphoric acid, 10 cents worth of potash. Total, $3.25.

One thousand pounds of bran carries off $3.60 worth of nitrogen, $2 18 worth of phosphoric acid, 90 cents potash. Total, $6.68.

One thousand pounds of straw carries off 78 cents worth of phosphoric acid, 17 cents worth of nitrogen and 30 cents worth of potash. Total, $1.25.

Total value of plant food carried off by bran and straw, $7.93.

Environments will always cause the details of improvement to be as varied as are the farms and their owners. We strike the key note when we feed the land liberally with cheap food products that the harvest of concentrated high-priced ones may be abundant.

Then true agriculture consists in taking from the soil such concentrated products as are suited to minister to our various wants, replacing them with crude, cheap and waste products so skillfully that no serious diminution of fertility shall occur. To do this to the best advantage requires a great amount of skill, training, knowledge and labor, and where either or all of these are notably deficient, the land suffers.

The Horse—His Early Training.

[By R. F. Parshall, of Tomah.]

Considering the elegance, style, ease of motion and profit, the horse is the most perfect animal God ever made.

His construction is of a remarkable character. He has existed from birth of all animal kind. Though his native country is not known, but was first brought under subjection to man in Central Asia and Northern Africa.

The disposition of the horse is naturally gentle and confiding, which qualities have made him a useful creature, both in the peaceful and waring conditions of nations. His capabilities of descerning objects at night, his acute sense of hearing and smelling, enhance his value to man.

There is a great diversity in the mental and moral qualities of the horse —some are bold, intelligent and good natured, others timid, stupid or cross— and by care or neglect each of these qualities become the characteristics of the animal, a quaint writer has well remarked that in this world there are three special objects of interest to man, women, money and the horse, and the man who does not love one or all of these is simply a fool. I invite your consideration to the last of these objects, and as the horse has become so inwoven with the comfort and profit of the race, and as his usefulness becomes identified with the interests of man just in proportion as he is taught to subserve the well-being of his owner, so his early training should become a subject of care to every one who would be profited by his speed or powers. No specific rule can be given applicable to the training of all horses. The nature and characteristic of each must be thoroughly studied and understood, and the kindest of treatment should always be maintained.

I am impressed that most men undervalue the intelligence and capabilities of the horse, consequently make no special effort for his education. The training should begin with the colt, it matters not how young, not in the way of getting so much, as in educating it to do what will be required of it in later periods. The child first learns his letters, then words, then sentences, and so on to completion. This often requires eight or ten years. Few people take time enough to educate or train the colt. He should be thoroughly trained and broken before harnessed and hitched to a wagon. The first exercise should be given with the halter. Farmers think anything is good enough to put on a colt, whereas, a nicely-fitting halter—one that cannot be broken —should first be put on him; he should learn to be led from pleasure, not from force; should never be hitched to anything that will not hold him. The horse that pulls at the halter, or balks, or kicks, has not been properly trained, and the man who allowed him to do either of these things first ought to have the sore head and receive all of the flogging. The colt should be so handled in the stable—head, limbs and feet—as to make him perfectly safe in future use. The second line of instruction should be with the bitting-harness, and that should be adjusted as not to give pain. The first lesson should not last over ten or fifteen minutes, never to give weariness. In this harness he should learn to yield to the rein, to back, to perform all the turns and phases which will be required of him in harness. Men who leave the colt untouched until he is three or five years old and then, without education, harness him to a wagon may expect to have a shy, kicking, run-away horse and no one to blame but himself. The horse can be taught to have a wagon come against him as well as the harness without fright. To have the tongue of the wagon come between his hind legs without kicking, as well as on the outside of them. The horse should be taught to do not only what may be required of him, but all he is capable of doing. The training upon any given line should be repeated until the habits of the horse are formed and the action become a part of his nature. The horse should be made to know that he is not a master or an equal, but a servant and that his best good is in obedience, submission to man must be demanded. And when chastisement as a last resort is inflicted it should never cease until entire submission is secured.

Some horses are never conquered, never broken, always go and do just as they choose and the reason is they know more than the man who has undertaken to train them. Some men have no business to undertake the breaking of a colt. They have no commanding power, no Psychology—no mesmeric force. Horses are very sensitive to the will power of their trainer.

But few horses are properly trained because the owner does not bestow thought and care upon them. At least

35 per cent. of the value of the horse turns upon his early training.

Some horses are extremely stubborn, and unless there is great caution they will be balky. What course should be taken with a young horse with this disposition? After he has been thoroughly bitted the harness should be put on him, the lines drawn through the thill straps to prevent his turning around, then a long strap attached to the traces and the draught on it just what the colt will endure without stopping. A horse inclined to kick should be treated with utmost care.

We should always address the intelligence or memory of the horse through the medium of pain or pleasure.

The profit to the farmer in raising colts and thoroughly training them is in advance of raising cattle. It costs but little more to raise a colt than a calf. The one a year old will bring $60, the other $10.

Mutton Breeds of Sheep.

[By J. W. Gaues, Lowell, Wis.]

For a common scrub farmer to write a paper upon any topic to be discussed at an Institute is like a rural member of the legislature. He goes to Madison, has a good time with the boys, votes generally on the wrong side of the question to suit his constituents, returns home after two years of weary toil to be cat-hauled around because he did not do anything becoming a statesman. So with me: at the close of this paper of eight pages of well-written matter, you will wonder why I did not say something about the "Mutton Breeds of Sheep." I was chosen by the committee on programme to write upon this subject, and if this article does not fill the bill, blame the committee not me. After being chosen I used all the spare trme I had for six evenings in writing upon the subject, and I had only completed two pages. On the morning of the seventh day I started for town with the determination of letting the job to some one else; but the boss committeeman said: "No, sir-ee. If farmers are not willing to do their part, how are we going to make this a success?" Failing in all other excuses I unfolded my "Mutton Breeds of Sheep," two pages, and began reading, feeling confident that after I had tortured him with that he would let me off. Instead, he says: "John, you have done remarkably well; although there is one thing you have forgotten to mention, and that is your topic, 'Mutton Breeds of Sheep.' Let me give you a little advice. You know I am one of the ablest and oldest writers of inland journalism in the Northwest. Go home and wait until the spell comes upon you; then write." After I had got straightened around, the next morning, the minister called in. (By the way, we are having a series of meetings.) "John," he says to me, "why have you not been out to the meetings of the last six evenings?" I says, '"Mutton Breeds of Sheep,' Beaver Dam, January 11 and 12. After that I am open for other engagements." My wife rushed in and said: "My husband is a Hypochondriac!" The minister went, and I went for a dictionary. "Hypochondria, a mental disorder in which melancholy and gloomy views torment the affected person." What to do I did not know. "Mutton Breeds of Sheep" must be ready by Tuesday next, and only two pages written.

After mature consideration I came to this conclusion, that there was but two known breeds of sheep—mutton breeds and no-mutton breeds. The no-mutton breeds will be described by my friend Jones; mutton breeds by me.

The most popular breeds of sheep in America are the Merinos, Cotswolds, Lincolns, Southdowns, and the various crosses. Where large flocks are kept for the production of wool no breed equals the Merinos, and many men prefer this breed to any other for all purposes combined, as they are very hardy and will stand neglect better than any other breed. Cotswold is a favorite breed when mutton and wool are both wanted. They are large, quite hardy, and more prolific than Merinos or the Lincolns. Their large size is one of their chief recommendations. Southdowns are especially desirable where early lambs are wanted. They produce wool in a fair quantity, and good in quality.

My idea is that almost any kind of sheep will pay if well managed, and I am sure there is less work about them than any other stock, and this is a big item.

Mutton-breeds of sheep are superior to the other kind, because we have three crops a year,