AGRICULTURAL.

TO MANAGE HEN MANURE.

Now that the cold weather is approaching and farmers shut up their hens more than in warm weather, a few hints on the best way to manufacture hen guano or compost may be appropriate. The first thing is to provide proper reservoirs for the manure.—Old barrels are just the thing, but strong goods-boxes will do. They will soon decay and be useless unless protected with oil and gas tar. Coating them inside and out with light crude petroleum will fill the pores with the oil, and make them as good as cedar for durability; but if the contents are likely to be moist, gas tar inside will be better. The number of these barrels must correspond with the number of hens. Then, if the weather is dry enough before freezing up to secure a quantity of road dust, fill all but one with the road dust, which is the very best absorbent you can get, and if dry, the barrels may stand anywhere under shelter without the freezing of the contents. If dry earth or dust cannot be obtained, the next best is finely pulverized soil which will, of course, contain a good deal of moisture and must be kept in barrels or boxes in the cellar, so as not to freeze.

If you can procure a quantity of charcoal dust, it may be mixed with dry coal ashes, and the mixture will make a good absorbent. Dry sawdust will do, but is not so good.—When road dust or soil is used, the more clay it contains the better it will be as an absorbent, and the less in quantity will be needed.

Now, having your barrels all ready, the rest of the operation is simple and easy.—All you have to do is to place a stratum, say an inch or two, in the bottom of the one empty barrel and then throw in the cleanings of the hen-house, then another stratum and another layer of cleanings. The thinner each layer of the two is, the more perfectly they will become diffused together in standing. The precise quantity of each is not very essential—only you must have enough absorbent to hold all the volatile parts of the hen manure, of which you may usually judge by the odor, which may be corrected by adding more of the absorbent. Proceed in this way with each successive layer.—Next spring your barrels will be filled with a very powerful and most valuable manure.

You may add to its value by pounding and cracking up fine all the refuse bones you can find, by means of a stone-mason's hammer or an old axe—placing the bones to be broken on a solid flat stone, and encircling them with a wide hoop to keep them from flying off when struck. Sprinkle the fragments of bone among the layers of manure, which will cut and work them down. A part of the broken bones may be left for the hens to eat with their food, and these will be manufactured in a more perfect manner into bone guano.

By a little care and timely attention you will secure a supply of manure the value and quantity of which will surprise those who first make the trial. All you will have to do in spring will be to pulverize and work over the mass, so as to be evenly and finely applied.—*Country Gentleman.*

BOOKS AND PAPERS ON THE FARM.

Book farming has often been held up to ridicule. While it is true that farming from a knowledge gained from books, without practical experience, has generally failed of success, it is also true that the best success in farming is never attained without the knowledge which may be gained from books and papers. Practical experience, accurate observation and close reasoning must go with such knowledge, and the two must go together in order to make the best suecess.—The manufacturer, the merchant, in short the successful man in any business is he who with good judgment gains a knowledge of the operations and experience of others engaged in the same similar lines of business, and profits thereby. Such knowledge is chiefly and most readily gained from books and papers.

The successful farmer is the reading one. It is only by reading that he can keep sufficiently posted up with the times, and be prepared to cope with the spirit of the age in which we live. It has been said that 'an agricultural community without papers and books adapted to its varied interests, is like a ship at sea without compass or rudder.'—Every one who has had an opportunity to observe various portions of our country must surely have noticed the wide contrast often seen in the condition of communities not very widely separated from each other, and also that the greatest degree of prosperity is always found accompanying the greatest degree of intelligence. In the reading community will always be found more money, better houses, richer lands, better tilled farms—worth more per acre, and in every respect a better social condition than will be found in the community where books and papers are not generally and freely read.

An enterprising, intelligent, reading farmer who settles in a backward, non-reading community soon raises the value of his own land, and also to an extent the value of his neighbor's land. He attracts the attention of other enterprising farmers to the neighborhood. A farmer cannot afford to do without books and papers adapted to his varied interests, and more than that he cannot afford to allow his neighbors to do without them, but should use his influence in all suitable ways for their improvement in this respect, inasmuch as the advancement of the mass is the advancement of the individual. *Dr. L. D. Morse, in St. Louis Journal.*

LIME IN SOILS.

Lime is very abundant in nature, being found in all fertile soils; indeed, as it enters into the composition of every kind of plant, we may safely conclude that it is necessary to vegetation.

It is an oxide of the metal calcium, possessing basic properties; having a great affinity for moisture and carbonic acid, on exposure to the atmosphere it rapidly becomes a hydrate, and finally carbonate of lime, in which state it principally exists in soils, though it is also found as sulphate and phosphate. From the earliest time lime either as carbonate or oxide has formed an important dressing for all kinds of land; whenever new land is brought into cultivation, or old pastures broken up, quicklime should be applied, whether the soil be stiff clay or light sand. We are better acquainted with the action of quicklime than of the carbonate, owing to its having engaged more attention from the chemist; but it is reasonable to suppose that the ac ion is similar in both cases, only much more rapid and effective in the former, and therefore its application is to be preferred. As much less is required, the expense of burning is compensated by the saving in labour.

Much difference of opinion still exists as to the action of lime; some chemists would limit its effects to vegetable matter only, ot ers confine its action to the decomposition of mineral matters, while a third c'ass look upon it principally as a manuring substance. We believe its value is due to all three causes. That lime has a most beneficial effect on inert vegetable matter is clear, from the advantages which follow its application to peaty soil; that inert vegetable matter exists in soils that have been long in cultivation and frequently manured is most certain; and that lime would in such cases prove as fertilizing as a dre sing of manure scems reasonable to conclude; but of course as its effect is destructive and in this sense dependent upon the presence of vegetable matter, it can never be substituted for manure.

Its action consists in reducing to an available form those substances which have not been already ahsorbed by plants on account of their insoluble condition. This, it is now generally believed, is effected by the gradual reduction of the humus into its ultimate products, carbonic acid aud water, and possibly ammonia or nitric acid; the nitrogen of the atm sphere uniting with the hydrogen set free in its nascent state. During this process it is probable that various organic acids are formed, passing rapidly one into another without entering into plants as such.

Lime removes the acidity often found in vegetable soils, either by destroying the acid or combining with it to form an organic salt.—Were the action of lime restricted to vegetable matter only, it conld not fail to prove a most valuable application, but its relation to mineral matters in the soil is perhaps more important still. In most stiff soils the alkalies are found united with silica and alumina in certain proportions, mostly insoluble, aid, therefore, useless. Rain-water containing acid might gradually dissolve out portions sufficient for a natural condition, but inadequate to the artificial requirements of cultivation.—Lime appears to possess the power of setting free the alkalies and magnesia from their insoluble condition, probably replacing them, and what seems rather extra rdinary is that when these substances are added to the soil and would pass away too rapidly and be lost, by some means not yet clearly understood, some possesses the property of fixing them as insoluble compounds, causing their union when those very substances from which it had previously displaced them. Any attempt at explanation of these remarkable changes would be out of place here; but should the present discoveries be confirmed by further investigation, a most important fact must follow, viz., the advantage of repeated applications of small quantities of lime, and the wastefulness of the old system of heavy dressings. Lime enters into the composition of most crops, and the quantity required for this purpose isbut small, and the natural supply in most soils so abundant, that we can hardly atiribute the effects of its applicat'on to this cause.

F om all these facts we should expect to find limestone soils a very fertile class, and when the other essential elements of fertility are present, such is the case. We are not certain that lime as carbonate acts in the ssme manner as in the caustic state; that its application to soiis light and heavy, mineral and peaty, has been faund beneficial is undoubted. Its influence may partly be ascribed to physical causes, making stiff clays more workable, sands more absorbent, and giving firmness to peaty soils. —*Michigan Farmer.*

AN INCH A YEAR.

A Minnesota farmer gives, in the St. Paul *Pioneer*, his experience of plowing a field for wheat one inch deeper every year, The first year he plowed the land four inches deep, and harvested seven bushels of wheat to the acre. The next season he plowed one inch deeper and took off twenty bushels per acre. Continuing to plow one inch deeper the next year, he harvested thirty-one and a half bushels. He says in conclusion:

"Last fall I did not go down for the extra inch. I feared if I kept on until I got down 15 or 20 inches, the straw would grow 18 or 20 feet high, and that won't stand the storms of Minnesota; but if we want long straw and heavy wheat we must plow deep. One inch deeper every year is plenty, until the proper depth is reached, and if this rule is followed strictly our farms will be in good condition many years hence."

SUBSOILING LAND.

For the thousandth time, almost, we are asked by a correspondent if we believe in subsoiling land, he stating that he "turned over some stiff clay loam, twelve inches deep, last spring, and his crop upon it was vastly inferior to that on the land that had not been plowed more than four inches deep." But, good friend, you did not subsoil your land at all. You trench plowed it—turned the subsoil to the surface; and that subsoil turned to the surface in the spring was probably sodden with water, heavy, sour, and as unfit to germinate seed and promote the growth of plants, nearly as if it had been crushed quartz.

Had you trench plowed the land as you describe in the fall, the result might have been different; yet it might not have realized the first season all you anticipated from your enterprise and industry. But had you really subsoiled it in the spring, that is, run a lifting or subsoil plow in the furrows after you had turned the soil four inches deep with the surface plow; lifting and breaking the soil, without inverting it or throwing it to the surface, to the depth named, we know, so far as one can know of similar actual experience, that the result would have been far different, and you would never have questioned the utility and profit of subsoiling such soils.—*Ex.*

PROFESSOR BELL'S EXPLORATION IN THE NORTH WEST.

Prof. Bell travelled west a distance equa to about four times the breadth of Manitoba, and also visited the great plains between the north and south branches of the Saskatchewan, and the touchwood Hills. He speaks in glowing terms of the

Agricultural Capabilities

of the Province of Manitoba and the country westward to Fort Ellice, and also the regions lying to the north of theQu'Appelle river. The district of the south to the Qu'Appelle and South Saskatchewan is not so fertile, nor does the climate appear to be so favorable for most crops.

The best farmers in Manitoba are of the opinion that if every one sowed as usual in the years threatened with grasshoppers, the loss to each would be slight; whereas, according to the present custom, if only one man say in a parish, has a crop planted, all the grasshoppers or black birds in the neighborhood flock to this spot and completely devour it. Last summer the grasshopper plague was confined to the old settlements around Fort Garry, west of the White House Plains, where a large proportion of the farmers have come from Ontario; the seed was put in as usual and

A Splendid Harvest

of both grain and green crops was obtained. In the neighborhood of Prairie Portage, spring wheat, which is the only kind yet cultivated, yielded from 30 to 45 bushels per acre, barley averaged about 50, and oats 75 bushels. The soil is so fertile, mellow and deep that beets, carrots and mangle wurtzels grow to an enor-length and size. Potatoes were an immense crop and for both size and quality Prof. Bell says he never saw them equalled in any other part of the Dominion. For the last two years Mr. Mc Kenzie has raised between 200 and 300 bnshels of onions on a small garden patch only a few rods square.

The Cattle

of Manitoba, Mr. Bell says, are far superior to the horse, the original stock of the former having been brought from Scotland by Lord Selkirk's followers, and the latter from Lower Canada. The native breed of horses are, however, well-suited to the wants of the Country. Mr. Bell's horses were driven from 25 to 30 miles, with loaded carts, over the uubeaten prairie every day, except Sundays, and improved in condition, although the only food they got was the grass they picked up at night and during an hour or two's rest in the middle of the day. All visitors who pay any attention to these things, are struck with the superiority of the cattle and the low prices at which at they may be bought, compared with the horses. The prairie grass of the north is admitted to be more nutritious than that further south, and horses turned out to winter will fatten upon it, whereas they cannot snbsist at all in Dakota and Minnesota. In such a great region, where the natural hay and pasturage are prac ically unlimited, and where grains and root crops flourish so well, and where experience has shown that horses thrive without care, there appears to be no reason why the finest breeds should not be raised in great numbers. Mr. Bell thinks our North West Territory is destined to be the great horse-producing region of the continent. Sheep are also found to do well in Manitoba, especially where the prairie is of a rolling character. The country is comparatively free from wolves, which follow the buffalo and are therefore now far to the west.

Any attempts which have been made towards the

Improvement

of the live stock or crops have been within the last few years and have met with very flourishing condition, and the annual exhibitions which have been held in the beginning of October, the last two years, have been highly creditable to the new province; the specimens of garden produce of all kinds, as well as of staple crops, proving beyond doubt the fertility of the soil and the excellence of the climate.

NOTES FROM COLUMBIA CO., WIS.

Editor *Western Rural*:—Another year of drouth has recorded its effects on our agricultural products, producing the following effects in this section. Spring-wheat is consid erably injured for want of rain to check the ravage of the chinch-bug from time of being in the drought state till matured.

Corn on light soils is an entire failure, while on well-manured and clayey and warm, moist soils, in most instances, it is splendid. There are fields of white Dent that will average two good ears to stalk, there being from one to five and six ears on the stalks.

Oats sown on rich, moist soil as they ought to be, yield forty to fifty bushels per acre Rye good. Buckwheat a failure. Peachblo.. potatoes on rich, clayey or mucky loams, and well tended yielded a fair croq, but as the were not planted thus, the crop was a failuret Early Rose partlally came to the rescue, by yielding considerably on light soils, and quite heavily on heavy soils.

The early cold rains gave the sorghum pots too shallow lateraly growth, so that when the dry weather had set in, the stalks were too weak to bear development to accomodate itself to the change by sending down roots for moisture. hence one of the most promising crops for years, was shriveled and nearly ruined.

Hops only about one fourth of an average crop.

Wheat is ninety, cents; rye, fifty-six cents; corn forty cents; buckwheat, $1-00; pork $ 3.65 to $ 4 per cwt beef, (dressed) four to five cents; on foot three cents; live hogs, three cents; apples, $ 3.20 to $ 4.50 per barrel; hops, thirty-five cents.

I agree with a remark I overheard that wheat will be worth $1.50 per bushel before next June, and dressed pork five cents a pound before the last of March coming.

We had a young Winter commencing Oct. 26, that passed off by only reminding us, with 14° above zero, that we must be prepared, for Old Boreas was marching on.—*Correspondence Western Rural.*

Two dessert spoonfuls of pulverized sulphur mixed with soft food and give to fowls two or three times a month is highly commended by some poultry breeders as promotive of good health and freedom from vermin.