

est terms. We saw it first in his barn last fall, and examined the hay made by its aid. Certainly the most fastidious animal could not desire sweeter, nicer hay than it was. Both as a labor-saving machine and for the improved quality of hay obtained by the use of it, this implement is valuable. "Bullard's Tedder" may be had of George A. Squier, Syracuse, N. Y., or S. S. Whitman, Little Falls, N. Y. These parties are agents for S. C. Herring, 251 Broadway, N. Y., by whom the patent is owned. Its price, if we are not mistaken, is \$70. Taylor's Patent Hay Tedder," is a more recent invention than Bullard's, but how it compares with its predecessor, we do not know. It is cheaper, the price being \$60. The "Ohio Mowing Machine Co.," Millbury, Mass., manufacture it. "Craven's Hay-Spreader," works on a different principle from those just described, and may be used either as a simple hay-spreader, or a Combined Hay-Spreader, Raker and Loader." The loading attachment consists of a large wooden tube or spout, through which the hay is forced or driven by sets of iron teeth. We should imagine that it would only work well on very smooth ground, and hence is not likely to come into very general use. The "Craven Tedder" is manufactured by "The Ames Plough Company," Quincy Hall, Boston, Mass.

Revolving horse rakes are now constructed in such a manner that the driver can ride, and yet control the machine more perfectly than on the old plan of walking behind it. One of these machines that we saw, has the rake placed between the wheels and the team. It is thus under the eye of the driver, who disengages the gathered hay, by operating a lever. Others have the rake behind the wheels, but are also regulated by a lever under the driver's command. These improved rakes cost from \$30 to \$10. We have not among our notes the address of any of the parties who manufacture them.

Horse pitch forks in great variety compete for the patronage of American farmers. In this Province, there is great incredulity as to the efficiency and utility of these implements. The more's the pity. Why men should resignedly doom themselves to intolerable back aches pitching hay into their barn-gables, or to the top of high stacks, when an old, broken-winded horse can do it for them faster and better, is a thing we cannot understand. Some ten Canadian dollars will buy one of the best of these horse pitch-forks, and it will pay for itself in a single season in the case of any farmer who has a large breadth of meadow. It is no longer a question whether a horse can be made to pitch hay.—The work is done before the eyes of wondering multitudes at every State Fair, and the number of competitors in this department, together with the large number of sales effected, give proof that this is no longer an experiment. We doubt if there are a dozen horse pitch forks in use in all Canada. There is not, so far as we know, a single implement-maker in this country who is manufacturing them. Yet their name is "legion" in the United States. Hardly a solitary respectable farmer is without one. A single firm has sold upwards of 20,000. How absurd it is then for any man to put on a wise look and say "horse-pitchforks are a humbug!" Among the numerous implements of this description that are now before the American public, it is difficult to say which is the best. The "Little Giant" and "Gladding-Fork," two modifications of the same implement, may safely be recommended. They are made by J. L. Mansfield & Co., of Clockville, Madison Co., N. Y. "Buckman's Patent Grappling Fork," is another good one. It is of light draft, needs no scaffold or inclined plane, works its own way over beams or under barn and shed windows, will grapple short or loose hay and straw, and may be used for hoisting barrels, boxes or bales, grappling for lost articles in deep water, and finally as a pair of ice tongs. S. R. Earls, 23 Church street, Albany, N. Y., is the manufacturer of this implement. The "Elliptic Horse Hay Fork" made by J. K. O'Neil, of Kingston, N. Y., also works well. It will handle corn stalks, flax, hemp, loose or sheaf oats, as well as hay. It can press tightly whatever it lifts, and is said to stow away more in a given space than other forks. "Roger's Patent Harpoon Horse Hay Fork" is a neat, light, simple implement, and takes up but very little room. It is made entirely of iron and steel, and is not much

larger than an ordinary hand pitchfork. It is sold by Nutting, Hull & Co., 357 and 359 River Street, Troy, N. Y. "Walker's Improved Horse Pitchfork," is very like the "Harpoon" fork just mentioned. The "Harpoon" has two barbs which thrust themselves into the hay on the implement being raised. "Walker's" has a single and somewhat longer prong or barb which supports the load taken up. "Walker's" fork is made by Wheeler, Melick & Co., Albany, N. Y. We must not omit mention of another invention for hoisting and storing hay, which differs materially from those just enumerated. "Tice's Hay Elevator and Carrier" consists of a track made of plank and fastened to the rafters a few inches below the ridge of the barn. On this track the car runs, which, by a peculiar arrangement, is held in position over the load to be hoisted until it receives its freight of hay from a horse-pitch-fork, when it is liberated and sent along the track to the desired spot. The operator unloads the car by pulling a cord, and the same pull that trips over the hay, restores the car to its position over the load. The car costs \$15, and a track of 60 feet about \$1. All the prices named in this article, it will be borne in mind, are in American currency. Slightly modified, the arrangement just described will elevate and unload coal, plaster, ashes and manure, from barges, canal-boats, &c. Thus it will be seen that with the modern, progressive American farmer, the toil of the hay-field is among the things that were. He cuts his grass with the mowing machine, cures it in double-quick time by the tedder, rides round in a gig and rakes it, puts it on a waggon with the loader, hoists it to the ridge-pole with a horse pitch-fork, freights it to the desired spot on a top-loftical railroad, pulls a string and all is over! The toil that bent the backs and broke the hearts of our forefathers is converted into a series of innocent amusements! Hip-bip-burrah!

Further notice of American Farm Implements must be deferred for the present.

## Familiar Talks on Agricultural Principles.

### THE WHEAT CROP.

WHEAT, furnishing as it does, the most important article of human food,—that which has been expressly called, "the staff of life,"—deservedly takes the first place among the crops grown on the farm. It is an annual herbaceous plant, of many varieties, the diversities being probably the result of difference of climate, soil, and culture. All the kinds cultivated on this continent belong to the same species, of which there are two leading varieties: winter and spring wheat. The root of this plant is well adapted to withstand severe cold, and hence it successfully braves the winters of a high latitude, thriving several degrees farther northward than any point in Canada. The grain is composed chiefly of starch, the per centage of which varies from 50 to 70 per cent; it also contains a large proportion of gluten, the per centage of which varies from 10 to 20; in addition to which it contains from 3 to 5 per cent of fatty matters. It is a note-worthy fact that the per centage of gluten in wheat varies according to the quality of the soil in which it is grown. A crop grown on fertile land not only yields more bushels of grain, but will give more and better flour than that produced on poorer soil. Wheat does best on strong, tenacious land, abundantly stored with both mineral and organic plant-food, in a well-elaborated state. It will neither thrive in poor soil, nor in soil whose resources of fertility are in a crude state. Most of the constituents of the grain can only be obtained from the richer kinds of manure, and there is, perhaps, no crop raised on the farm which is more exhaustive than this. The straw of wheat is composed largely of silica. It also contains lime, gypsum, magnesia, and common salt. Chemistry has shown that the ash of wheat contains a proportion of bone earth or phosphate of lime. About 70 pounds of this substance are taken by a crop of wheat from an acre of ground. This is a substance which is never found in any large proportion even in fertile soils. It abounds most in new lands, in consequence of the ashes of the wood that has been recently cleared and burnt out of the way. Wheat requires not only a rich but a deep soil. It flourishes best in land that has been deepened by subsoiling and underdraining, as well as enriched

by liberal supplies of manure. Manures containing nitrogen, phosphates, and alkalies, are best suited for soil in which it is intended to grow this crop. Guano, liquid manure, animal refuse, wood ashes, and crushed bones, are sources whence such supplies may be obtained. The composition of the plant, and its habit of growth, show what place it should hold in a rotation of crops on the farm. From the fact that it requires to have its material of nutriment in a thoroughly elaborated state, it is plain that the soil should be as mellow, and well-fined as possible. This suggests the culture of roots as an excellent preparation for wheat, as nothing so completely mellows land as a well-cultivated crop of roots. Wheat very readily permits grass and weeds to grow beneath its shelter. This is another reason why it is best a root crop should precede it, since in this way the land is effectually cleansed. Its true place, therefore, evidently is after a root crop and before grass, which last is sown to excellent advantage along with wheat.

It is foreign to the object of this "talk" to refer to the harvesting and after treatment of wheat and its straw. Only a few hints as to the principles that bear on its successful culture can now be given. Wheat, although our most important grain, has come to be looked upon as a rather uncertain crop, especially in the older sections of the country. This arises chiefly from the diseases and insect enemies to which it is liable. The principal diseases are rust, mildew, smut, ergot, and canker or blight. The chief insects that prey upon wheat are the midge, the Hessian fly, the army-worm, and the joint-worm. It is worthy of especial attention that good farming is a safeguard against most of the diseases that affect this crop. Scrupulous care to sow only healthy seed is a most effectual means of securing a healthy increase. Like begets like, and disease is propagated in the plant-world, much as it is transmitted from father to son in the world of human beings. Early sowing is another excellent precaution. Drainage is most important. Wheat growing on low, undrained lands, with a peaty or calcareous soil, is very liable to be attacked by mildew. Keeping this grain in its proper order of succession to other crops, is another means of preventing disease. Thorough working of the soil and keeping it supplied with the right nutritive elements in due proportion, is also of importance. The insect enemies of the wheat crop are not so easily kept under. Though good farming is to some extent a protection against them, yet they frequently defy the utmost skill, industry, and vigilance. Thorough tillage, careful preparation of the soil, deep fall ploughing, burning stubbles, a judicious rotation of crops, rolling the young wheat, &c., have proved themselves excellent precautions. By threshing wheat infected with insects on a tight barn floor, and burning up the chaff and dust, a large proportion of the eggs and larvæ destined for future increase, may be destroyed. A species of wheat called "midge-proof," is pretty extensively sown now, and entomologists hold out the hope that before long the midge will be held in check by other insects preying upon it, as has been the case with the Hessian fly and other pests of the farm.

DESTROYING CANADA THISTLES.—A correspondent of the *Western Rural* gives the following method which he adopted:—"Some years before I came to Michigan, I purchased twenty-seven acres adjoining my old farm. I made the purchase when the owner was harvesting his wheat; there were twenty acres of it in with wheat, and some nine loads of it were so full of thistles that it was pitched to the waggon and from the waggon to the machine without binding. The same fall I piled over the straw and mixed in twelve bushels of slacked lime to rot and kill the thistle seed. The next season I summer-fallowed and cultivated and sowed to wheat. The following season I harvested a fine crop, and every thistle on the twenty acres could have been bound in a single bundle."