AGRICULTURAL.

The Peculiar Property of Wheat.

The peculiar property of wheat which distinguishes it from all other cereals, is the large proportion of gluten which it contains, the predominance of which renders it so much better adapted to the human constitution, as food, than any other vegetable production.

The late Sir Humphrey Davy speaks of gluten as one of the most nutritious of all vegetable substances; and, in fact, wheaten flour is more or less valuable to the baker, the housekeeper, and the consumer, just in proportion to the quantity of gluten it contains, which varies considerably in different kinds and qualities of wheat. This difference is produced by the various conditions of soil, climate and manure; and it is a question of no small importance, both to producer and consumer, what proportions and modifications of these elements are most favorable to the production of gluten in the largest proportions.

The influence of climate may be first noticed, as being, probably, as great as that of either soil or manure.

Wheat may be cultivated in the northern hemisphere from the equator to the verge of the arctic circle. Within this range, the zone lying between the 50th and 60th degrees of latitude, produces the most mellow and easily-manufactured wheat. Southward of this belt, the grain becomes large, ricey, thin skinned and dry; whilst northward, the berry gradually grows smaller, and the bran or skin thicker, rendering it of inferior value in commerce. Bakers, who find that that flour spends the farthest which contains most gluten, give the preference to Spanish, Egyptian, and African wheats; but owing to the color being yellowish, they have to mix it with English and American in small proportions.

The proportion of gluten in wheat from different parts of the United States seems to be about 23 to 24, the amount of starch, sugar, gum and water being 76 to 77.

To determine the influence of different kinds of manures on the production of gluten, some experiments were made, the result of which is given by Boussingault. The manures were applied to the same soil and the same seed, and the results were as follows, showing a range of from 12 to 35 per cent:

	Gluten.	Starch.	Bran and soluble matter.
1.—Human urine,	35.1	39.3	25.6
2.—Bullock's blood,	34.2	41.3	25.5
3.—Night soil,	33.1	41.4	25.5
4.—Sheep's dung,	32.9	42.8	24.3
5.—Goat's "	32.9	42.4	24.7
6.—Horses' "	13.7	61.6	24.7
7.—Pigeons' "	12.2	63.2	24.6
8.—Cows' "	12.0	62.3	25.7
9.—No manure,	9.2	66.7	24.1

From these experiments, it seems that some wheats must be much more useful than others to the baker and the consumer of bread; whilst other kinds raised with different manures, must be much more useful to the manufacturer of starch. The battle, it would appear, was between the gluten and the starch, there being little more than one per cent difference in the other components. But, whilst one kind of manure produced gluten and starch in nearly equal quantities, 35.1 and 39.3, the amount of starch is about five times greater than that of gluten with some other manures, and when no manure was used, the proportion of starch was more than seven times that of gluten, or 9.2 of gluten to 66.7 of starch.—[Country Gentleman.

Vines and Fruit Trees.

Laboratory of the State Chemist, }
29 Exchange Building, Baltimore, March 22. }

As this is the season when special attention should be given to vines and fruit trees, I send you for publication the following recipe, said by a gentleman of great experience in its use to be a certain antidote against fungus or insects on them.

Take of sulphur in powder, or flour of sulphur, 1 pound; soft soap, 2 pounds; strong tobacco water, 1 gallon; lime water, 2 gallons. Mix and apply with a brush or mop over the body and limbs as far as convenient.

To make the lime water, it is only necessary to take a few pounds of unslaked lime, put it into a barrel of water, stir it well, cover over the barrel, and let it settle. If there be no unslaked lime convenient, then a few oyster shells or lumps of limestone may be burnt, thrown into a barrel of water, and treated as above. All fruit trees, especially the pear, should be examined at the root by taking away the earth for a few inches, and if worms are found lodged in the bark, they should be destroyed with a wire, and then the earth may be replaced, mixed with a handful or two of common salt, to the root of each tree.

Respectfully, &c.,

James Higgins.

P.S. The flour of sulphur can be procured from any apothecary or druggist for about twenty cents per pound.—[Baltimore Sun.

Corn for Fodder.—Corn is as often planted for use as feed; and we doubt not that farmers would find it for their interest to make a more free use of this excellent feed. Few products of the farm are more nutritious or more convenient.

A single acre will ordinarily produce five or six tons, and will keep four cows for three months. But a much greater result has been sometimes obtained. In 1845, in Massachusetts, over thirty-one tons of green stalks were grown upon an acre. The product of two acres and thirty-two rods was estimated as equivalent to fifteen tons of the best of hay. On this lot, ten bushels of corn were sown. When it is to be used in this way, it should be sown in drills, two and a half or three feet apart, sowing from three to four bushels to the acre. After sowing, the ground should be harrowed. The Stowell and West corn should be used. Good feed may thus be obtained by the end of June. The stalks should be suffered to wilt before feeding. If they are to be dried, or kept for winter, they should be cut in the tassel, and a little sprinkling of salt is recommended. This tends to prevent them from moulding, and is also agreeable to the cattle.

The stalks may be prepared by various processes. Sometimes they are cut before the corn is ripe. This is for the benefit of the feed, and it saves the cost of the corn. Sometimes they are left till after the corn is gathered, when they are cut up from the roots. Which is best, on the whole, is yet a question. We are disposed to think that, by the use of some well-arranged cutter, the entire stalk my be consumed for feed. Every part of it is highly nutritious, and we see not why the whole may not be so prepared, as to be eagerly eaten by different kinds of stock.—[Plough, Loom and Anvil.

Early Seed Corn.—Many of our farmers are apt to be too negligent in selecting corn for the next planting. The usual way is to wait until the crop is gathered, and then while husking, select some of the best looking ears for seed, but this is not the best way. My worthy friend, farmer D———, is somewhat noted for the possession of a superior variety of corn, and on account of its being three weeks earlier than the usual varieties, his neighbors consider themselves fortunate, if they can get their seed of him, and he is sometimes annoyed by the repeated drafts upon his choice selection of ears. Now what is the secret of the superiority? Let me tell you, and then let me say "go and do likewise." Farmer D——— has always planted the common kind of corn, the same as his neighbors, but for quite a number of years, he has made it a practice to pass through his field every few days, after his corn begins to turn, and select the ears that first ripen, and carefully husk them and hang them up. Each lot he keeps by itself, so that he can tell which lot came off first, which second, &c., and when he plants in the spring, he uses first that which he first selected.

By continuing this course of practice, he now has the satisfaction of having his crops about three weeks earlier than his neighbors, besides being of a superior quality. The same principle applies to all kind of seed. If you wish early peas, beans, potatoes, &c., just take a little pains to select the earliest ripe, and look out for them next spring, when planting time comes. From much observation, I am convinced that more depends upon the selection and proper care of the seed, than upon early planting.—[Puritan Recorder.

Poultry Manure.—Poultry-dung, Sprengel informs us, is one of the most powerful manures, and is therefore worthy of greater consideration than is generally bestowed upon its collection, especially as it soon decomposes and loses much ammonia, and would lose still more if it did not dry so quickly, and thus prevent a further decomposition of the urea. The manure of pigeons and domestic fowls is the most valuable, because they feed mainly on grain, insects, and worms. To secure poultry-dung in its most valuable state, the floor of the house should be strewed with soil abundant in humus, the humic acid of the earth combining with the ammonia of the droppings, thus saving it from loss during the process of putrefaction. Strewing the floor with sand or sawdust is of no use, unless in point of cleanliness. The droppings of geese are not so valuable as of pigeons or chickens. When they come in contact with the grass, they quickly destroy it, which fact is explained partly by the uric acid it contains, and partly by the ammonia which is so soon generated and developed on decomposition. These caustic substances become valuable as soon as rain falls and dilutes them. The same writer remarks that poultry manure should always be applied as a top-dressing, and harrowed in lightly. If ploughed in, the main soluble substances would be carried too deep into the soil.—[Progressive Farmer.

Agriculture in France.—A letter writer for the Republic says: "A trip of six hundred and fifty miles, from the northern to the southern extremity of France, justifies me in the expression of my opinion that sun does not shed its rays on so fair a land, or one so thoroughly cultivated. The whole country is literally a garden. Every square foot, from the mountain-top to the lowest ravine, is made to produce something, if it be susceptible of it. Their mode of planting or sowing their crops, whether on plain or hill side, produces the finest effect on the appearance of the landscape. The place allotted for each crop is laid out in squares, or parrallelograms, with mathematical precision, and, whether large or small, the best garden could not be divided with greater accuracy. As there are no fences or hedges, and as the different crops are in various stages of maturity, you can imagine the variety of hues that meet the eye, and the magnificence of the panorama that stretches out in every direction as far as the vision can penetrate. I am sorry to add in this connection that seven-eights of the agricultural labor is performed by females, while two or three hundred thousand stalwart men in uniform are idling away their time in the barracks of the cities and villages. In the absence of fences, cattle, secured by ropes, are driven about their pasturage by females; and sheep are confined within the required limits by boys, assisted by a shepherd's dog."

Warm Feed.—A correspondent of the (N. E. Farmer) gives the following fact relative to the management of one of his cows, and its result: "I will give your readers my mode of feeding one of my cows. I purchased her last November, when she gave four quarts of milk a day. I commenced feeding her with cut hay, two quarts of shorts, and a few carrots, wet with cold water, twice a day for a month. At the end of that time she had not increased in her milk at all. I then commenced wetting the same amount of feed with boiling water, and at the end of the second month, she give regularly *six* quarts per day, which I thought a fair gain. Where a person needs considerable milk, and keeps but one cow, I would recommend a trial of this mode of feeding."

Burnt Clay.—Burnt clay is now extensively used, in some sections of the country, as a manure for garden soil. It is generally prepared, I believe, by first accumulating a sufficient quantity of woody matter, and covering it with clay. The mass is then ignited, and burnt, till the wood is reduced to coal and ashes, similar to the manner pursued in coal burning. The charcoal, ashes and clay thus furnished, constitutes an excellent dressing, and produces highly beneficial effects on both crop and soil.—[N. E Farmer.

A Novel Method to Make Butter.—At Hougham, says the Stamford (England) Mercury, a farmer's wife ties up her cream in a linen cloth, buries it for 24 hours in a damp corner of her garden, empties it into a bowl, stirs it with a spoon, and the butter and buttermilk separates. Her butter is said to be sweeter than that which is made by churning.

To tell Good Eggs.—If you desire to be certain that your eggs are good and fresh, put them in water. If the butts turn up they are not fresh. This is an infallible rule to distinguish a good from a bad egg.

The Practical Science of Candle-Making.

The Belmont Candle Factory—in that curious London district, Vauxhall—presents a famous example of applied chemical science. Rather more than forty years ago, Chevreul, the French chemist, announced to the Academy of Sciences the important fact, that fatty bodies are of a compound kind. He it was who first pointed out that fat is not a simple organic substance, but a salt formed of animal acid, (margaric acid,) combined with an animal base, in such a state as to be serviceable, the acid then being obtained separately. This discovery—the essential base of the modern art of candle-making, the fatty acid set free from the less inflammable base, being wonderfully improved as regards its burning properties—led to the vast extension, in this country, of the stearic candle manufacture, so ably represented by what is so well known as "Price's Patent Candle Company;" and it is to the obtainment of this acid in a pure hard state and at the cheapest possible manufacturing cost, that the candlemaker's chemist has since given his almost undivided attention.

This point gained, Chevreul, still pursuing his subject, came upon another fatty acid—oleic acid—originally developed in lard. Putting these purely scientific researches into the workman's hands, as in all such transitions, was a task of great difficulty, and it was not until a very few years ago that these discoveries, in fact, assumed a really practical and commercially valuable form.

Acting upon Chevreul's suggestion, M. de Milly, a Parisian candle-maker, set to work to disengage the acids from their base, "glycerine," by boiling the raw material, tallow, with thin cream of lime, on the principle of what is now termed "lime saponification." The glycerine dissolved in the water, the fatty acids combining with the lime. Sulphuric acid is then used for destroying this combination; the acid seizing on the lime, and setting free the fatty acids, pressure being finally employed to obtain the solid mass.

Thus far the French led the way in this curious manufacture; but, in 1829, our countrymen stepped in. At that date, Mr. James Soames patented a plan for separating the solid and liquid parts of cocoa-nut oil, and this process subsequently become the property of Messrs. Price, who were induced to establish large cocoa-nut kernel crushing mills in Ceylon, to keep up their supply of the now necessary cocoa-nut oil. Large plantations of cocoa-nut trees were made in Ceylon; and of these, now coming into bearing, Messrs. Price possess above 1,000 acres. The oil is obtained from the fruit by drying the kernel, and then crushing it under edge-stones—the reduced mass being subjected to cold pressure, for obtaining the best portion of the valuable oil, and afterwards to hot pressure for getting out the whole attainable oleaginous matter.

The solid matter resulting from this pressure, or the cocoa-nut stearine, was, in itself, a step in advance of the tallow product; but the candles now known as "composite," so independent of snuffers, were yet undiscovered. In 1840, Mr. J. P. Wilson, anxious to produce economical self-snuffing candles, for the particular purpose of the illuminations on her Majesty's marriage, found that cocoa-nut stearine, mixed with the newly-discovered stearic acid, produced candles burning with a good light, with the great advantage of requiring no snuffing attendance. They are the candles made on this general principle that we now find in every grocer's shop, and in every dwelling-house, whose darkness is as yet undispelled by the brilliancy of gas.

Later chemical discovery—for it must be remembered that the whole routine has been the result of a continued chain of the elegancies of chemical research—led to the distillation of fats, previously acted upon by sulphuric acid, or by nitrous gasses. The raw material now used is palm oil, and in the existing refinement of the process, six tons of palm oil are subjected to the action of 6¾ cwts. of concentrated sulphuric acid, at a temperature of 350° Fahr. Under this treatment the glycerine is decomposed, sulphurous acid gas is evolved to a considerable extent, and the fat is changed into a mixture of fat acids, dark in color, and possessing an elevated melting point. The product is washed, and it is then deposited in a still, from which the air is excluded by the agency of stearine.

In its original condition, palm oil is of a bright orange red tint, as thick as butter. After the acidulous treatment and the washing, it is changed to a hard black mass. The distillation separates this into the pure acids, brought over in the form of vapor, and the charred refuse matter left behind in the still. The distilled mass may be used for making cheaper classes of candles; or by being subjected to severe pressure, cold and then hot, it is brought into the condition necessary for making the Belmont sperm candles.

The cotton used as the wick is plaited, and then dipped in a solution of borax. It is this plaiting which gives the wick the slight curvature at the flame, and the preparation with borax renders the the cotton somewhat less combustible, except at the point which we find is always bent over to the edge of the flame, where it is in contact with the air, and is consumed. The moulding of the fatty matter, or the disposition of the combustible mass round the wick, is effected in a frame, which has attached to it a box, with a wick bobbin for each mould, the movement being so contrived, that the action which expels one set of moulded candles, draws off enough wick for the succeeding operation. Of course, each candle is moulded upon the free end of the wick length, and the severance is effected by the agency of a traversing knife. Forceps are employed to hold each wick over the centre of its mould, the axis of the two being made to coincide with accuracy. In this condition, the mould is run through a steam-heated chamber to warm it, the required temperature being reached by the time the mould arrives at the filler. The filled mould then passes onwards, and, when cool enough to admit of the withdrawal of the forceps without injury to the moulded mass, the superfluous fat is removed, previous to the mould being emptied. All these motions are performed by means of guide railways—a clockwork precision being observed throughout the operation. Each apparatus contains 200 moulds, each mould having 18-inch bobbins, which, when full, hold 60 yards of wick.

Chemistry has done more for the candle manufacture than mechanics. Much yet remains to be done in the manipulatory processes, for at present, some wicks will get out of the candle's centre, whilst the bottoms occasionally turn out to be hollow. Hence, the very best candles are yet made by the old hand system.

During the early part of the present year, Mr. G. F. Wilson, the managing director of the works, introduced castor oil as a new and economical material for this manufacture. Castor oil, when treated with hyponitric, nitrous, or sulphurous acid, solidifies, and furnishes what is called "palmine." This palmine, when used after being pressed, is well suited for hardening tallow, as well as for mixing with wax. In making composite candles with it, is mixed with an equal amount of hard fat acid.

In 1852, the Belmont works employed somewhere about 1,000 hands, turning out upwards of 100 tons of candles a week, of a value of £7,000 or £8,000. Since that time, the works have been surprisingly increased, the number of the employed being 2,000, working upon a capital of £700,000. They cover two acres of ground, besides further space at the Battersea offshoots.

But this extension was not equal to the necessities of demand, and an enormous branch from the parent undertaking has been just now got to work near Liverpool. The new works are named from Bromborough Pool, at which point on the Mersey they are placed. Here the vast area of 3¾ acres is actually roofed in with corrugated iron; fourteen steam boilers being fitted up to supply the great steam-heating power required in works of this kind.

These works, like their progenitors in London, are perfect models of good arrangement and management, and they approach about as near to the perfection of combined industrial operation as any existing example of the great factory system of modern times.—[Pract. Mech. Journal, Glasgow.

Discovery of Antiquities in the Copper Country.—We have now in our possession, for safe keeping, and as a nucleus of a collection of curiosities, some very curious and singular articles made of copper. They were found near the west shore of the river, about a mile above the mouth, at a place where now is a brick-yard and these were disinterred by those digging in search of good brick clay. After taking off from the surface of the ground about two feet of sand, the clay was exposed, and the stump of a tree was discovered. Digging still lower, about six or or eight inches into the clay, and overturning the stump, these articles were brought to light.

First, a copper spear, about 14 inches in length, and at its base a groove or dovetail is made, in which to insert a wooden shaft or handle.

Two other spears, each about 12 inches in length, and similar to the first.

Third, two pieces of copper that had evidently been very nicely forged, but for what purposes they could ever have been applied, is by no means plain; and it is quite difficult to give in writing a clear description of them.

These are about 14 inches long and two inches wide. Upon one end there is the appearance of an attempt to make a cutting edge.

They weigh about three pounds each, and are specimens of good workmanship.

That these tools are the work of those who lived here years ago, seems the more likely from the place and position in which they were found, being in the strata of clay, lying under the roots of a stump, and about forty feet above the present level of the river and lake.

The tree had grown up since these articles had been put there, and the deposit of sand made above the clay the depth of two feet. To do that, the river and lake must have been forty feet higher than its present level. This of course was years ago, before the memory of the present races now inhabiting this country.

Together with these tools was found scraps of copper, as though fragments left at the time of the manufacture of the tools.—[Lake Superior Mining News, Dec. 21.