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ANDREW ARCHER, Editor.

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Agriculture.

Rot and Mildew in Grapes.

A correspondent of the *Country Gentleman*, who has given much attention lately to the subject of grape rot and mildew, treats it at length in the following terms:—

1. Rot and mildew and other fungous growths can injuriously affect plants of the higher order, like the grape, only when they are in a debilitated condition and there is an interruption of the processes of elaboration of the plastic material, during which elaboration the plant, by its vital functions, is enabled to resist the advance of germinating fungous spores.

2. This debilitated condition in the case of the grapevine is, as a general rule, brought about by two separate causes: First, the partial exhaustion of the soil in the inorganic and organic elements of plant food—the grapevine, as well as any other fruit-bearing plant, demanding inorganic or mineral substances in the soil, and notably the salts of potash and phosphoric acid, together with a corresponding proportion of nitrogen and other organic substances, which are furnished partly from the soil, but chiefly from the atmosphere. The second cause of debilitation arises from the sudden changes of temperature. According to the distinguished botanist Sachs, all plants perform the functions of growth and development between two definite limits of temperature—limits which never fall below 32°, or the freezing point, on the one hand, or rise above 122° on the other. Thus the vital functions of the plant may be partially arrested, intercepted, or at least rendered less active, by extremes of temperature, which in case of those plants most affected by rot and mildew will be found to be between 50° and 113°. But during the processes of growth, the transformation of plant food from its crude state into plastic material, and its assimilation by the plant, takes place most actively and healthily at something near the mean of the two temperatures, say at 80°—these processes being slackened and finally arrested as the temperature falls on the one hand, or rises on the other.

3. The functions of the plant being arrested by a too high or too low temperature, it is deprived of the power of resisting the attacks of fungi, and an approach to both these extremes of temperature favors the development of certain fungi, the assaults of which are made when the grapevine has the least power of resistance, and the fungi have the greatest power for attack. Thus the grapevine, under ordinary methods of cultivation, is not only sufficiently fed with potash, phosphoric acid and other mineral substances, but it is also made to suffer from the debilitating effects and influence of a high temperature at mid-day and a low one at night. In fact, the vine is subjected to starvation and exposure both, and it is not strange the result is almost universal mildew or rot.

4. The vine districts of Ohio, Indiana, Illinois and Missouri, so far as climate is concerned, are liable to great extremes of temperature between summer and winter, and also between one summer or winter and another. The same wide divergencies characterize the atmospheric conditions in summer—sometimes the vine having to submit to blazing hot and humid days, with cool, or even cold and dewy nights, and in others to undergo the trying ordeal of heat and drought, with the mercury at 120° to 125° at 2 o'clock, and twelve or fourteen hours thereafter to a fall of 40° or 50°.

5. The development and growth of rot and mildew are found to be most pronounced and active where these changes of temperature and atmosphere are most marked. During and after electrical storms, with heavy rains, interrupted or followed by bursts of sunshine which almost scald, and followed by warm and wet, or cool and very dewy nights, both rot and mildew immediately appear in their most active and virulent forms. On the contrary, where the summer season is long, warm and dry, but not too dry, where all the conditions are adverse to fungous growth, then the grapevine is making a comparatively slow growth, and ripens wood and fruit equally well.

6. So, when foreign and tender varieties of grapes are planted out of doors, though ample soil and border preparations are made for them, and complete winter protection afforded, they sooner or later suffer and succumb to rot or mildew. But when those same vines are given shelter, and are protected from night dews, radiation and evaporation, and other adverse atmospheric influences, they

make splendid crops, without the intervention of artificial heat. And so of the tender kinds of native grapes, when they are trained along a wall, and more or less protection afforded by projecting roofs or partial cover of anything, which, while it does not deprive them of food, light or heat, interferes with the fall of heavy dews and active evaporation and radiation, these vines more or less successfully escape mildew and rot.

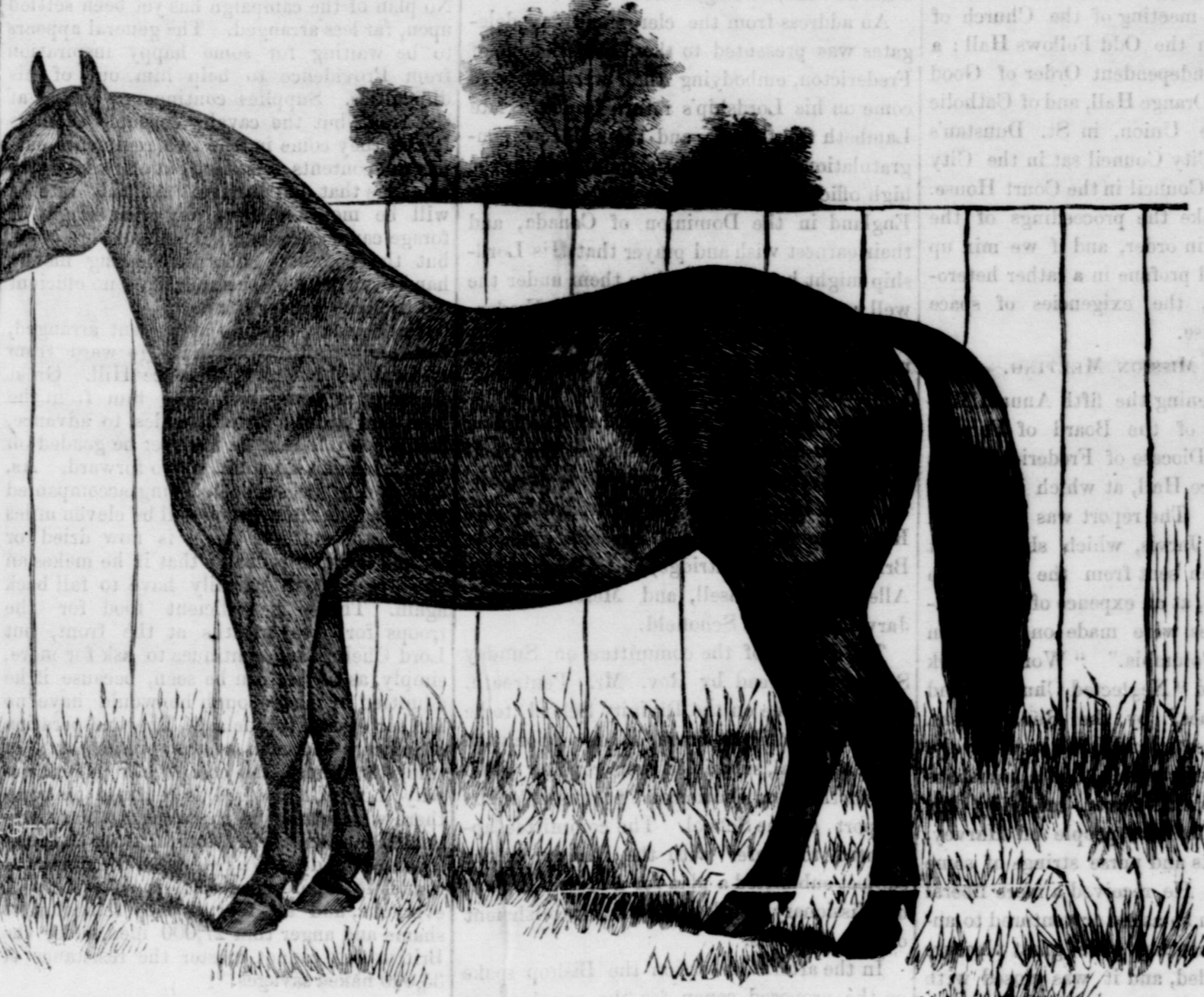
7. But even when the conditions of soil and temperature are best suited to the vine, as on the grape-producing islands of Lake Erie, the vine now rots and mildews nearly as badly as elsewhere, notwithstanding there is no perceptible change in the winter or summer temperature, or in the hygrometric condition of the atmosphere. For twenty-five years grapes were grown on the same spot successfully, without manures or fertilizers of any kind. During the earlier part of this term, rot and mildew were scarcely known, but in later years both have developed to such an extent that their crops have become almost total failures. This state of affairs seems to point to the important consideration that while soil, situation and temperature have much to do with successful grape growing, the main point is to keep the soil up to its original fertility, by the liberal use of fertilizers, especially the salts of potash, lime and phosphoric acid.

8. Successful grape growing then seems to depend on two important conditions: The soil must be kept in a state to afford all needed organic and inorganic elements of plant food, and in unfavorable seasons some contrivance must be used to prevent mildew or rot, by protecting the vines from heavy dews and sudden changes of temperature, between the day and night. Those delicious table grapes, the Chassels in variety, and the Muscats and Hamburgs, with which the tables of the wealthy of Paris are supplied, are mostly grown in the neighborhood of Fontainebleau, near that city, in the open air. But the vines are trained after a peculiar system, on stone walls about seven feet high, having a metal or wooden coping projecting about 40 inches. This wall and coping are said to be equal in the matter of grape ripening, to a south-facing wall of two and a half degrees of latitude, independent of the insurance which they afford against heavy dews, too sudden evaporation, and the frosts which are apt to follow from active radiation.

In conclusion, it may be added that several more strong points may be made by more or less clearly pointing out how our grape propagation has had an inevitable tendency to weaken the vine, and finally to destroy its constitution, hardness and vigor. Most hardy native sorts suffer from mildew and rot in direct proportion to the length of time they have been propagated, and bought and sold as common stock, in the commercial nurseries of the country. In the propagation of the vine there are certain well known principles which must govern in practice, or the result will be a rapid deterioration of the vine, and its final extinction.

Hints on Sheep Husbandry.

It should be the object of the farmer to keep those domestic animals which will pay the best for the food they consume. A certain amount of every kind of stock is necessary for carrying on the farm, and this the farmer must keep without regard to direct profit. He must have horses and oxen for doing the work, cows to supply the family with milk, butter and cheese



"Udine," the property of M. W. Dunham, Esq., Wayne, Ill., U. S.

and sheep to furnish mutton and clothing. But beyond this, he must keep something from the sale of which, he can raise money for the payment of his taxes and other cash expenses, and we believe that sheep husbandry will answer this purpose better than any branch of stock raising.

Some have gone into sheep husbandry and failed of success, but we believe that in most cases these failures have been due to the lack of careful and systematic management which the business requires. Sheep husbandry derives its profits from two sources both of which must be carefully considered, the early maturity of the carcass and the quantity and quality of the wool. In these days of railways and markets, the former is the grand object of the producer, and the latter though valuable must be regarded as subsidiary. It should be the object of the breeder, therefore, in the first place to select his breeds with reference to the quality of their mutton, and second, for the quality of their wool. Having selected a good breed, the one that combines as nearly as possible, the qualities of good mutton and good wool, everything depends on the breeder as to whether his flock shall continue to improve or whether it shall deteriorate and run out.

In looking over a flock of sheep, it will almost always be observed that some of the animals, the food and treatment being precisely alike, will fatten much more readily than others. There is the same attention paid to one that there is to the other, and the same expenses involved every way, but when slaughtered one will yield twice as much profit as the other. On comparing the sheep, one with the other, it will be found that there is an evident difference of conformation, a fineness of bone, a roundness and compactness of form, a condensation of substance and beautiful proportion in all its parts, which will characterize the one and not the other. The temptation is great, in such cases, to slaughter and market the fat animals on account of the greater present profit, and keep the lean ones for breeders. No management could be more short-sighted and disastrous than this. The best should be selected as breeders and to this rule there should be no exception nor variation. A lamb should never be preserved that has this, or any other defect, for the bad qualities of sheep are transmitted as well as the good, and no improvement in a good point already possessed, can compensate for the introduction of an obvious blemish.

If the breeder will carefully proceed on this principle of the selection of the fittest, he will soon find that he will have few if any inferior animals, and the good qualities of his sheep transmitted from generation to generation, will not be accidental. They will become a part and portion of the breed, and may be depended upon with the greatest degree of certainty. They constitute the practical illustration of the word blood. Young breeders must not expect to make all these improvements at once, but let them faithfully practise this principle of the selection of the best, applied both to ewes and rams, and in due time, they will find their flocks systematically improved, and will be well repaid for the care which they have bestowed upon them. The neglect to practice these few simple, common-sense rules, has led to very many of the failures in sheep husbandry.

Sheep husbandry to be successful requires intelligent and careful management, but when well managed, there is no stock that the farmer can keep that will pay better, if as well. The mountain is the natural habitat of the sheep and other things being equal, hill or mountain pastures are to be preferred, but the sheep has been so long domesticated that his natural habits have somewhat changed and as a rule, he will do well anywhere, where there is enough of feed and good water. Another requisite is plenty of shade trees where they can retire in hot weather. We desire to emphasize this latter point, for sheep will not thrive in summer where this is neglected. In lowland pastures this is the only substitute possible for the lower temperature and cool breezes which his natural home, the mountains afford.

The winter management of sheep is of still greater importance, for fatal diseases rarely prevail in a flock while they are in the pasture. It is when they are subjected by the rigor of our climate to confinement at the barn that they are the most liable to disease. They should not be kept too warm nor yet exposed to driving storms. They require and must have an abundance of fresh air. Sheep are naturally so well protected from the cold, that except in the case of cold and driving storms they prefer to remain outside. But they should always have a warm shelter with a tight roof where they can retire at will. A drenching rain in winter is damaging to sheep, as their fleeces will hold a large amount of water which will require a long time to dry out. Early cut hay is better for sheep, and in fact for any kind of stock. Proveder such as shorts, oats, beans, and especially roots, should be judiciously fed. It is better not to have too many sheep in one yard. From seventy five to a hundred is about the extreme number that will do well together.

The breed of sheep to be kept must depend largely upon the situation and object of the breeder. If he lives near a city or large village, or on the line of the railroad, he can probably do better in raising sheep for mutton than for wool. In that case the Cotswolds and South Downs are the best. But these produce good though not the finest wool, and are also good mutton sheep. If his desire is to produce fine wool there is nothing better than the Merino, though this animal is less hardy than some other kinds.—*Maine Farmer.*

Deep and Shallow Ploughing.
It is an old and true saying that circumstances alter cases, and there is nothing to which it applies with greater force than to the question of deep or shallow ploughing. It is a question which has been much discussed among farmers, one upon which there has been a great diversity of opinion and yet it is one which every farmer must settle for himself. A few years ago extreme deep ploughing was strongly advocated by the agricultural press, and many went so far as to insist upon a depth of ten inches or a foot for all soils. The result was what ought to have been expected; on some lands it worked admirably, while other fields were nearly spoiled for present use. So far as the average of New England soils is concerned, this dogma was the greatest nonsense and farmers were not long in finding it out. The extreme depth advocated then has proved too much even for the prairie soils of the west where extreme deep ploughing has gone out of fashion.

We believe in deep ploughing, when circumstances will admit of it, but almost everything depends upon the nature of the soil. Most certainly, deep ploughing will not do when a basin is formed below a certain line in which water will settle and remain until it can escape by evaporation. The result in such cases must be poor crops, much poorer than if such lands were ploughed shallow. Drainage is what such soil needs and then the plow can be put down with impunity. Another condition which will not admit of deep ploughing is when the soil is thin and the subsoil is gravelly and worthless. This condition, however, is susceptible of being improved upon, for by a thorough system of subsoiling and manuring the depth of the soil and its producing capacity can be greatly increased. Not every farmer is able, either for lack of team or dressing or both, to treat his shallow soils in this way, and unless it can be done, shallow ploughing is much the best.

There is some land where the surface and subsoils do not materially differ; such are deep clay loams and soils formed by a deep deposit of alluvium. A good example of the former may be found in Arctostock, on the Kennebec River, and other places, and of the latter on the broad belts of interval or bottom lands which are found on the Adirondoggin. In such soils the plow may run deep and the effect will be to bring to the surface and to the favorable action of the rain, air and sunshine, those elements of fertility which have heretofore been beyond the reach of the plant. Such land when ploughed deeply will stand a drought much more better than when ploughed shallow, because the roots can penetrate into the subsoil where they will find moisture long after the surface has become dry and parched.

It should be remembered that it will take double the dressing to fertilize land that is ploughed to the depth of a foot than when it is ploughed six inches, and the converse is likewise true that when we plow only five inches we exhaust the soil in half the time that we do when we plow ten inches deep, but the mechanical improvement brought about by deep ploughing and thorough pulverizing, gives much more freedom and greater feeding room to the roots of plants and is an advantage which should be taken into account. From this brief discussion of the question, the following may be deduced: Wet lands should not be ploughed deep until they have been thoroughly drained. Thin soils with a gravelly and worthless subsoil should not be ploughed deep with the expectation of present profit, but subsoiling and heavy manuring for a series of years will greatly increase its capacity for crops, and proportionally, the value of the land. For present profit, such lands must be lightly ploughed. Deep clay loams and alluvial soils, can be ploughed deep and their fertility and capacity will be thereby increased. From the New York *Observer* we clip the following sensible remarks bearing upon this subject:

"Some twenty years ago there was a mania among the agricultural theorists for deep ploughing. Every farmer, it was said, had a farm under his hands of great value, where the plow had not yet reached. No matter what the character of the surface and the subsoils were, the plow should go in to its beam. But these men are beginning to get their eyes open. Mr. Geo. E. Waring, Jr., in speaking of the results of ten years' management of 'Ogden farm,' says: 'About six acres were, some seven or eight years ago, ploughed about twelve inches deep. The subsoil of blue clay, which was brought to the surface, was a lasting injury to the land. It still shows the ill effect of the treatment, in spite of time and manure. There are some soils

that would be benefited by plowing twelve inches deep, but they are scarce.' The rule may be said to be: 'Never turn up over one or two inches of unfertile subsoil in one season; and when so turned up the land should receive a dressing of manure.'"

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Washing and Shearing Sheep.

We question the policy of making any pretence of washing sheep. We believe the practice often results in injury to the sheep, and, from the manner in which it is done, but increases the difficulty of determining the true value of the wool. It is the next thing to impossible to wash sheep in cold water anything like clean without keeping them in the water so long as to imperil their health, and the amount of dirt removed generally depends upon the honesty of the washer. Even if the owner of the flock is honest, his employees may not be, and the result is that many lots of wool claiming to be washed contain nearly as great a proportion of dirt as others which make no pretence of washing. If buyers would generally agree to discourage the practice of washing sheep, the matter of buying wool would be simplified.

We have had considerable practice in washing sheep, and we have seldom participated in such an operation without having our indignation aroused by the cruel, brutal way in which some of the men employed would seize the sheep by their wool plugging them into cold water, nearly strangling them, handling them so roughly as to cause them unnecessary fright and suffering, and finally turn them out upon the banks so weakened by their treatment as to fall down in the mud, to be again seized and plunged under the water to rinse off the mud. We think the sooner such washing is discontinued the better it will be for the sheep husbandry of the country.

Now, the next question, after having decided about washing, is, when should sheep be shorn? If allowed to wear their fleeces too late in the season, they will suffer from heat, and if deprived of them too early, they will be rendered uncomfortable, and possibly subjected to severe colds from cold snaps, and perhaps from cold storms. As farmers used to manage their flocks, the safer way undoubtedly was to allow the sheep to retain their fleeces until warm weather is fully established, say about the middle of June. But flock masters take better care of their sheep now than they did twenty or thirty years ago, when they did not seem to be fully convinced that shelter is necessary, and would have laughed at the idea of yarding and housing sheep in summer to protect them from cold nights or cold storms. Now our most successful flock masters have suitable yards and sheds and conveniences for yarding them when the weather is unfavorable, and knowing the danger of exposing the shorn sheep to the influences of cold changes, will take the time to yard them, and properly feed them till more auspicious weather returns.

With such careful attention to the welfare of the flock, it may be advisable to shear earlier in the season, and so relieve the animals of their oppressive burdens before they will be likely to experience many very warm days. We think if the farmer is careful to house his flock in unfavorable weather, his welfare will be promoted by shearing the latter part of May, or at least quite early in June.

How to Manage Celery.

Set celery in shallow furrows, drawn four feet apart by a light plow. The plants should be six inches apart in the row, and pains should be taken to have the soil pressed firmly about the lower part of the root. If the ground is thoroughly moistened at the time of planting, there is no occasion for shading the plants. All that is necessary in the way of culture for some time after transplanting is to keep the soil well stirred between the rows. When the plants have attained a height of from ten to fifteen inches, commence the operation of "earthing up." The soil is first thoroughly loosened upon either side of the rows; then as all the leaves of each plant are gathered together and held in an upright position, the soil is gradually drawn around it to the height of several inches. The operation is very simple, yet, like everything else, requires some experience before it can be skillfully done. In our own practice, we have found that three men, or two men and a boy, working together, perform the work in the cheapest and best manner, one man standing upon each side of the row, and with a hoe drawing the earth about the plants, which are held in proper position by the third. As the celery grows, more earth is from time

to time drawn up around it. It is not necessary to hold the plants after the first operation. The only precautions are, not to earth up too much at a time, and to be sure that the earth is fine, and not lumpy or cloddy. Care should also be exercised to prevent any earth from getting between the stems of the outer and inner leaves.

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Berkshire Swine.

The following are the approved points and marks of Berkshire Swine: Color black, with white on feet, face, tip of tail, and occasional splash on the arm. While a small spot of white on some other part of the body does not argue on impurity of blood, yet it is to be discouraged, to the end that uniformity of color may be attained by breeders. White upon one ear, or a bronze or copper spot on some part of the body, argues no impurity, but rather a reappearance of original colors. Markings of white other than those named above are suspicious, and a pig so marked should be rejected. Face short, fine and well dished; broad between the eyes; ears generally almost erect, but sometimes inclined forward with advancing age, small, thin, soft, and showing veins; jaw full; neck short and thick; shoulder short, from neck to midding deep from back down; back broad and straight, or a very little arched; ribs long and well sprung, giving rotundity of body; short ribs of good length, giving breadth and levelness of loin; hips good length from point of hips to rump; hams thick, round and deep, holding their thickness well back and down to the hocks; tail fine and small, set on high up; legs short and fine, but straight and very strong, with hoofs erect and legs set wide apart; size medium; offal very light; hair fine and soft; no bristles; skin pliable.

Coloring Butter.
A dairyman asks whether we regard it as a morally right to color butter, and thereby deceive the purchaser into believing its fine color indicates its excellence? We think our correspondent too morbidly sensitive on this point altogether. As butter made at the season when the grasses are at their best, has naturally a light golden color, and its flavor and aroma are then the finest, the consumer very innocently connects, the fine flavor with the color, and refuses to believe butter good unless bearing this pleasing tint. Now, as the natural coloring matter has no taste, and really has nothing in itself to do with the flavor, the color at its best is only an ornament. And when consumers insist upon this fictitious mode of valuation, what is even the conscientious butter maker to do? As a fictitious tint is insisted upon, the butter maker has no alternative but to allow the consumer the pleasure of tasting his butter through his imagination—when, looking upon its rich golden tint, he can smell the clover blossoms in January. Why should he be deprived of this pleasure? No, it appears to us that the butter making is only responsible for the use of a harmless substance, which, while it does no injury, will add to the consumer's happiness as well as the producer's profits.—*Ec.*

Training the Tomato.

A report of the Maine Pomological Society contains an account of a novel method of training the tomato plant. Stakes, seven or eight feet long, were inserted in the ground the last of May, three feet apart, in a warm, sheltered location, and strong tomato plants were procured, which had been started under glass, and contained one or two blossom buds. These were planted near the stakes. The plant was then tied to the stake with lising, and all the side branches which had pushed at the axillar or angles formed by the separation of the leaves were pinched or cut out with scissors, so as to compel the plant to grow on a single stem; and every week during the season these branches were removed, and the stems from time to time were tied to the stake. When a sufficient number of clusters had been formed, the remainder were removed, so as to concentrate the whole energies of the plant to the growth and ripening of tomatoes; and the heaviest branches were supported by tying them to stakes. As the result, the ripening of the tomato by this method is accelerated, and its flavor is improved because every part of the plant is exposed to the free action of the sun and air. It is not soiled by coming in contact with the ground; is not so apt to decay, and more ripe tomatoes can be raised in a limited space; but it requires constant care and industry

The June report of the Illinois Department of Agriculture shows an increase in the acreage of corn of 293,706 acres over 1878. The crops are in a much better condition than last year.

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