THE SOUTHERN PLANTER

Devoted to Agriculture, Horticulture, and the Household Arts.

Agriculture is the nursing mother of the Arts. [XENOPHON.

Tillage and Pasturage are the two breasts of the State.—SULLY.

J. E. WILLIAMS, EDITOR. AUGUST & WILLIAMS, PROP'RS.

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From Josiah Parkes' Essays on the Philosophy and Art of Land-Drainage.

Influence of Water on the Temperature of Soils, &c., and the Physical Action of Water.

* * * The importance of an inquiry into the physical properties of different soils, and particularly into the causes affecting their state of heat and moisture, has been glanced at by various philosophers and agriculturists; but I am not aware that a systematic pursuit of it has yet engaged the attention of any British experimentalist. Mr. Handley, in his letter to Earl Spencer, which preceded the formation of the Society, has cited certain phenomena with which, it must be admitted, we are very insufficiently acquainted; and he has pointed out, as still remaining among the mysteries of nature, the action of several of her most energetic agents. He observes, "The experimentalist might be usefully engaged in determining the temperature of the earth at its surface, and to the depths accessible to the cultivator; the influences exerted by heat, light, and air; how far they penetrate into the soil, and at what point seeds cease to germinate; the effects of different culture in promoting the absorption and retention of caloric; the extent and operation of capillary attraction;—points which, hitherto much disregarded, evidently act an important part in hastening and perfecting the maturity of plants, and the study of which appears to be at least as interesting to mankind as those scientific labours which have been exercised with so much zeal to deduce the intensity of a central fire from experiments showing the increasing temperature of the body of the globe the deeper you bore into it."

I have no pretension either to the ability or the knowledge to fill up these *vacua* in the science of agriculture; it may appear, even from the following imperfect observations, that the gaps are still wider than those above recited; yet, I would express my conviction that there exist no obstacles which should discourage the possessor of land and leisure from entering on this unexplored field of investigation; but, on the contrary, there is reason to anticipate that his labours would be made in a land of promise, and that they would be abundantly repaid.

Previously to detailing my own and other very limited experiments on the temperature of soils, it may be well to consider some of the operations of the husbandman, their intent, and the manner in which the heat and moisture of a soil may be affected by them. The two principal agricultural processes, upon which, perhaps, the fertility

of land depends as much as on the artificial aids now so scientifically and beneficially applied to it, are drainage and pulverization.* These mechanical operations are practically known to be indispensable to the full development of the natural powers of soils, as well as to the profitable employment of the numerous and costly stimulants latterly introduced into agriculture; and it is my present object to show that the temperature of soil is materially influenced by the perfection of these processes; and that each particular soil is benefitted by them, according to the degree in which it may require to be artificially drained and worked. You have forcibly remarked, [addressing Ph. Pusey, M. P.,] that "all who are acquainted with improved husbandry are now agreed that, on wet land, thorough draining is to a farm what a foundation is to a house." Water, indeed, forms an essential element in soil, but there may be as much difference, in respect to fertility, between a *wet* soil and *moist* one—though they be identical in other respects—as between a swamp and a garden. By drainage and pulverization the proper degree of humidity is to be attained in most soils; for, though it is wisely ordained that we cannot control the precipitation of rain, we do possess the power of regulating, within certain limits, the quantity of moisture to be retained by the earth, and of adjusting it, as it were, to the quality of the soil and to the requirements of vegetation.

Section I.

Physical Action of Water.

The consideration of the well-known effect of drainage on soils surcharged with water, naturally leads to an examination of the causes of the change produced in them by so simple an operation. A soil perfectly dry, or one perfectly wet, *i. e.*, constantly drenched with water, would be nearly alike sterile; and we may conceive that some certain proportions may exist between the amounts of heat and moisture adapted, so far as their agency is concerned, for bringing a given soil, in a given latitude or situation, to its maximum state of fertility. The researches of different philosophers have elucidated the laws which pertain to water, in its several states, as a fluid, a solid, and a vapour or steam. There is, probably, no natural substance which has been investigated with greater success, and there is, perhaps, no other substance which performs more numerous or more important parts in its action on soil, and in the economy of vegetable life, than water. In its chemical relations to the solid, saline, and gaseous constituents of soil, there may be still something to discover; but its physical properties as regards heat, its operation as a solvent, and its mechanical laws, are sufficiently ascertained to enable us to understand, and explain satisfactorily, the various benefits that are afforded to wet soils by drainage.

If a soil be saturated with water, the nobler classes of plants cannot flourish; they vegetate more or less imperfectly, until the quantity of water be so diminished as to suit their habits. The reduction of the excess of water to the due proportion can only be effected, naturally, by its gradual evaporation, *i. e.*, by its conversion into vapour; and its transition from the fluid to the aëriform state is accompanied by the absorption of so large a quantity of heat from the soil in contact with it, that it may be convenient to consider its action in this respect first, and to endeavour to appreciate its amount.

When water is set over a fire in an open vessel, its temperature, as indicated by the thermometer, cannot be made by any force of fire to exceed 212°, under the mean atmospheric pressure of about 30 inches of mercury. The temperature of the water then becomes stationary, and the heat of the fire is afterwards expended in converting the water into steam or vapour. The temperature of the steam continues to be precisely that of the water, and it has been found that it requires about six times as much heat to boil off any given volume of water as would raise the temperature of that volume from 50° to 212°. Hence it is concluded that the difference, or 162x6=972 degrees of heat, have passed through the water, and entered into the composition of every atom of steam. Steam, therefore, has a much greater capacity for heat than water. These continual accessions of heat are absorbed by the steam in the act of its

* The term *drainage* is here used in an extensive sense, not confining it to the construction of artificial conduits for water, nor to its application on those soils only which are reputed as *wet*. The mere acts of digging, ploughing, and working soils reputed as *dry*, do, in reality, effect drainage, by opening channels for the descent of water from the superficial to the lower strata.

formation, and become what is termed *latent*, *i. e.*, insensible to the thermometer, which, plunged in the steam, marks only the same temperature as that of the water from which it was generated viz., 212°. This latter is termed the *sensible* or *thermometric* heat of the steam. That the whole of the heat thus expended in changing water from its fluid into its gaseous state has entered into the steam, is proved, conversely, by condensing a given weight of steam in water, when it is found that a pound of steam will raise about 6 lbs. of water from 50° to the boiling-point.

Water is vapourizable at all temperatures when exposed to the atmosphere. Its expulsion from the earth does even, under certain circumstances, continue when the atmosphere is replete with moisture, or at what is termed the dew-point. And it is most important to observe that, at however low a temperature the water in the soil, or that of the atmosphere incumbent on it may be, at which vapour is formed and expelled, the same amount of heat is carried off by a *given weight* of vapour as if it had been generated in the open vessel over the fire above referred to, or in the close boiler of a high-pressure steam-engine. A practical confirmation of the truth of this law has been obtained by evaporating water under widely different pressures, when it appeared that the same weight of fuel (or measure of heat) was consumed in converting equal bulks of water into steam at all those different pressures. It is ascertained that it requires as much heat as 2 or 3 ounces of coal will produce to convert 1 lb. of water into vapour; it is, therefore, evident what an enormous quantity of heat must be taken from the soil in cases where water is allowed to remain stagnant upon it till it evaporates.

As heat is generally considered to be an imponderable body, we are without the means of ascertaining directly, by weight or measure, the quantity of heat absorbed from soil by the evaporation of water. The following illustration of it will, however, be familiar enough to the mind of the engineer, and will also, I think, enable intelligent farmers to form an idea of its immense amount.

If we suppose the rain falling on the surface of an acre of land in the year to be 30 inches in perpendicular depth, it would amount to 108,900 cubic feet=3,038 tons; which, spread over a twelvemonth, gives an average of 298 cubic feet=8¼ tons, or 18,647 lbs. per diem. This weight of water would require, for its diurnal evaporation—supposing it were all carried off by that means—the combustion of about 24 cwt. of coals, as ordinarily used under a steam-boiler, or 1 cwt. PER HOUR PER ACRE throughout the year! We thus obtain some idea of the abstraction of heat from land under the circumstances of perfect aqueous repletion and stagnation, and there are too many soils approaching to them. We may also imagine the depression of the terrestrial temperature consequent on the abstraction of so much heat from the mass of the soil—a depression which must ever be in proportion to the excess of water present in the soil, over and above the due complement required for the supply of vegetation. Soils in that state must necessarily be very cold in the spring months, and much colder at the time of the commencement of vegetation, and throughout the summer, than well-drained or naturally drier lands. If we knew the capacity for heat of any given soil, and the weight of water mixed with it in excess over the proper complement necessary for vegetation, it would be easy to determine, very nearly, the depression of temperature caused by its evaporation. We know that the heat of a pound of water in its gaseous state, that is, as steam, would raise the temperature of about 1,000 lbs. of water one degree; so that, if the specific heats of the solid and fluid bodies were alike, the evaporation of a pound of water would keep down the temperature of 1,000 lbs. of earth one degree; of 500 lbs., two degrees; and so on.

Secondly; excess of humidity obstructs the absorption of heat by the solid matter of the soil. Water, in a quiescent state, is one of the worst conductors of heat with which we are acquainted. If it be warmed on the surface—and it derives, when mixed with soil, nearly all its heat from the sun's rays—water transmits little or no heat downwards.

If a mass of water be heated from below, the whole quickly attains an uniform temperature by reason of the motion excited amongst its particles. The lowest stratum, when heated, becomes of less specific gravity than that resting upon it, and the heavier superincumbent portions descend and push that which has been warmed upwards. In this manner rapid circulation is induced.

If, on the contrary, it be heated from above, *i. e.* on the surface, the film of warmed water floats on the top, by virtue of its superior levity, and no heat is conveyed below; there is no circulation from above downwards. Much of the heat of the sun's rays is, therefore, prevented by excess of water from entering into, and being transmitted through, the mass of the soil.

Thirdly; water is a powerful radiator of heat, *i. e.*, it cools quickly. All bodies, whether fluid or solid, possess peculiar powers of emitting or radiating heat, and water was esteemed by the late Professor Leslie—in which opinion he has been joined by other philosophers—to stand at the head of radiating substances.

The phenomena of the production of cold by radiation and evaporation are elegantly exemplified by the well-known experiment of exposing water, warm enough to give off visible vapour, in one saucer, and an equal bulk of water drawn from a well in another saucer. The former, on a sharp frosty morning, will be found to exhibit ice the soonest.* The cooling powers of evaporation and radiation combined, and of radiation chiefly, or solely, are represented in this experiment by the order of congelation in the two vessels in time; but the difference in the quantity of heat emitted from each of them is immense, as appears from what is stated above with reference to the constituent heat of vapour.

Fourthly; as the temperature of water diminishes during the night, or in the daytime, according to the varying conditions of the atmosphere, by radiating its heat to the heavens, its specific gravity increases; and the superficial stratum, which is first cooled, immediately descends by reason of its augmented density. This film of cooled and heavier water is as quickly replaced by relatively warmer and lighter portions, which become cooled in turn, and successively sink. Water, therefore, though a non-conductor of heat downwards when warmed on the surface, becomes a ready vehicle of cold in that direction when cooled on its surface; and this cooling process may even continue, under fitting circumstances, until the whole of a given mass is reduced to the low temperature of about 42°, at which point water attains its maximum density. The further descent of cold through this process would then cease; but the refrigeration occasioned by it must affect all soils, to a greater or less degree, which hold water in excess, *i. e.*, when in a state of stagnancy near to the surface. Those soils only can be exempt from this chilling influence which are not naturally retentive of water, or which are artificially and deeply drained.

Thus, excess of water conduces to the production of *cold* in soil, by means of several independent, vigorous and ever-active properties.

On the other hand, when a soil is naturally so porous, or is brought into such condition by art, (viz., by drainage,) that rain-water can sink down into the earth, it becomes a carrier, an alert purveyor, instead of a robber of *heat;* and tends to raise, permanently, the temperature of the mass of useful soil; and this more particularly and beneficially during the vegetative season. Rain-water, at that time, conveys downwards the more elevated superficial heat of the soil, and imparts it to the subsoil in its course to the drains; it leaves the soil in a fit state to receive fresh doses of rain, dew, and air, and in a better condition to absorb and retain heat, at the same time that it promotes, in other ways, its fertility and productiveness; but a consideration of the chemical effects attributable to the continual circulation and renewal of water and air is foreign to the present discussion.

In order to render the change of water perfect, and its action uniform throughout a field, all drains should be deeper than the active or worked soil, and covered. If drains are open, much of the rain precipitated on the surface necessarily passes into them before it has permeated the whole mass; consequently, it carries off with it heat, which would have been usefully employed in warming the lower strata; and it may, at the same time, remove fertilizing matter. If drains are not deeper than the worked bed, water remains below in a stagnant state, which must chill the roots of plants, and diminish the temperature of the superincumbent mass.

Gardeners and florists are well aware of the injurious influence of water when supplied constantly to the pan instead of to the surface of the soil in the flower-pot; and *bottom* water, as it is frequently and very appropriately called, produces the same ill

* Boiling water thrown on the ground will freeze sooner than cold water.

effects when stagnating too near the surface of the great agricultural bed.

Superficial drainage is comparatively of little value, and is, perhaps, exemplified in its worst practical form by land tortured on the ridge and furrow system. When land is permanently cultivated in high ridges, the crowns can obtain but partial benefit from the action of rain. The gradation from the comparative dryness and warmth of the summit, to the suffocating wetness and coldness of the furrows, is commonly evidenced by the state of the crops grown on land so disposed.*

To be continued.

Omitting too Much.

A green, good-natured, money-making, up-country fellow, who said everything drily, "got things fixed," and struck up a bargain for matrimony. Having no particular regard for appearances, the party agreed to employ a not over-wise country justice to put on the tacking. He commenced by remarking that "it was customary on such occasions to commence with prayer, but he believed he would omit that." After tying the knot, he said "it was customary to give the married couple some advice, but he believed he would omit that. It was customary, too, to kiss the bride, but he believed he would omit that also." The ceremony being ended, the bridegroom took the justice by the button-hole, and clapping his finger on his nose, said: "Squire, it's customary to give the magistrate five dollars—*but I b'leve I'll omit that!*"

Let habits of industry, honesty and perseverance be the register of your life.

* It would be curious—but, possibly, more curious than useful—to learn the origin of this remarkable artificial configuration given to land, which is, I fancy, peculiar to England and to particular counties. One would think that this system must have been invented previous to the discovery that water would find its way into cut drains; or, the inventor may have considered rain as his greatest enemy, and that he ought to prevent its entrance into the soil and get rid of it as soon as possible. I once put the question, as to the utility of this process, to a few farmers in Cheshire with whom I was in company. Their notion was that an undulating, being greater than a plane surface, more stuff would grow on it. It stood to reason that such must be the case! This was debated at great length, I contending it was a fallacy. On a division I was left in a minority of one.

From Memoirs of the "Society of Virginia for Promoting Agriculture.

Rotation of Crops.

By W. C. NICHOLAS, ESQ., *Vice President of the Society.*

RICHMOND, OCTOBER 2, 1818.

DEAR SIR:

Through you, I offer to the Agricultural Society of Virginia, a paper upon the rotation of crops, and the importance of stock to complete the good effect that can be expected from any rotation. I am sure I need say nothing to impress upon the society the value of any system, that will give meat for our own consumption and to spare, increase the product of bread stuff, and give additional fertility to the lands of Virginia.

With the most anxious solicitude for the success of our efforts, to improve the agriculture of our country,

I am, with great respect and regard,
Dear Sir, your humble Servant,
W. C. NICHOLAS.

JOHN ADAMS, ESQ.,
Secretary Agricultural Society of Va.

ROTATION OF CROPS.

Of all agricultural subjects, this perhaps is the most important, and to a Virginian, the most difficult. Experience affords us little light upon the subject. The practice in Virginia, heretofore, has been to cultivate our lands more with a view to immediate profit, than with any regard to the future. All the various soils in the country eastward of the mountains, have been used in the same way, and the same crops have been cultivated by all, without regard to the fitness of the soil, or to the situation of the farm. Everything that could be drawn from it has been eagerly taken, without giving anything in return, by ameliorating crops, manure, or even rest. The land has either borne, in succession, exhausting crops, or it has been as much or more injured by improper use of its pasture, as it is falsely called.

In fixing on a rotation, a farmer should ascertain what crops are best suited to his farm, and in what succession such crops ought to follow each other, so as to make the greatest possible profit, consistently, not only with keeping his land in good heart,

but in an improving condition. "A judicious rotation of crops is the ground-work of general improvement. If a judicious system be adopted and persevered in, it cannot fail. No mode of execution can make up for a defective one. The same crops which under one system would be unprofitable and injnrious to the land, under another rotation, with intervening ameliorating crops, might not only be profitable, but might promote its fertility." What I shall suggest to the Society upon this subject, will be the result of my own experience and observation, assisted by all that I have been able to derive from the English and Scotch writers—making the necessary allowance for difference of climate, soil and products. I have, without scruple, availed myself of their suggestions, whenever they appeared rational, and more particularly, when they were founded upon facts properly vouched for. In speaking of the agriculture of Great Britain, I cannot deny myself the satisfaction of expressing my warmest admiration of the exalted merit and patr otism of the distinguished men of that country, who have, by devoting their talents, time, and money, to agricultural pursuits, brought that most useful art to a perfection unknown to their ancestors, or to the people of any other country. The Duke of Bedford, Mr. Young, Lord Kames, Mr. Anderson, Sir John Sinclair, Mr. Coke, Lord Sommerville, and others, may have less splendour attached to their characters; but I have little doubt, that they have been more usefully employed than Mr. Pitt, Lord Castlereagh, the Duke of Wellington, or Lord Nelson. I trust the people of Virginia will not be less attentive to the improvement of a country so deservedly dear to them.

I will consider, first, the principles on which rotations ought to be arranged; next, the various sorts of rotations which have been adopted in Virginia, for different periods of two, three, four, five, six, or seven years; and lastly, any miscellaneous particulars connected with this branch of enquiry.

It is not believed that the same land, without some interval, will continue to yield the same plant to advantage; there may be some exceptions, but they can only occur where the land is the richest alluvion soil, or is frequently and heavily manured. A farmer should, therefore, avoid frequent repetitions of the same articles in his rotations. The propriety of adopting any particular rotation must depend on the climate; for it would be absurd to attempt to make gourd-seed corn and sweet potatoes in Greenbrier; a light, sandy land should never be selected for grass, nor cold, wet, stiff land for corn; on the situation of the farm in regard to markets, for some articles will pay in some situations that would be unsaleable in others; and upon the condition of the soil, whether fertile or exhausted. A farmer cannot carry on his business, unless he has various kinds of crops upon his farm. If he had nothing but wheat and tobacco, he might not be able to procure corn and hay. By having various articles, he does not run so much risk, either in regard to the season or the sale of his produce; and if he fails in one article, he may succeed in another. The crops should be so arranged that the labour of plowing for each, of sowing, weeding, &c., shall proceed in a regular succession, and the labour or business of the farm should not be too much crowded at any one season of the year, but that the crops produced on the farm should be cultivated by the same hands, (except in harvest,) and the same teams. Avoid, as much as possible, having two grain crops; in this country, a deviation from this rule must be admitted; so that small grain of some kind, must succeed corn: this is unavoidable, but must not recur too frequently. To raise those crops most likely to be productive of manure, the use of which cannot be dispensed with, under any rotation that can be devised. To arrange the crops so as to keep the land in good condition and increasing in fertility. Variations in the rotation will be found necessary and expedient, as the condition of the farm may alter. Keeping these maxims in view, the va i ous systems that have been practised in Virginia, shall now be considered.

Two years rotation.

When wheat was first made a crop for market in that part of the State that had been previously devoted to the culture of tobacco, the rotation was corn and wheat alternately. It was soon found that this course was too hard for the land, and that wheat and corn, in such rapid succession, gave precarious and scanty crops, and that

even the river bottoms could not bear such a scourge. I am satisfied that nothing short of manuring, very heavily, the half that is in corn, will justify the expectation of either good crops, or preserving the fertility the land might have possessed when this course commenced. The impracticability of doing that without summer food for cattle, and with no winter food but what the offal of the wheat and corn affords, must cause this rotation to be rejected at once. If it was possible to ensure a good crop of clover, after every crop of wheat, I believe alternate crops of wheat and clover would be made without injury to the land: but the clover crop is too uncertain to be relied upon for this. It is rare that clover succeeds after a heavy crop of wheat, by which it is subject to be smothered; it is likewise liable to be killed by frosts and severe droughts, in its infant state, and it is said that land tires of it as soon as of any crop.

Three years rotation.

Corn, wheat, and pasture; this is the most common rotation practised in Virginia. Under this rotation, as under the last, the lands have grown worse yearly, as under that, most of the maxims upon which judicious rotations are founded are violated. There is not a proper mixture of grain and green crops; the grain crops perpetually succeed each other, and the proportion of land in grain is too great. If the farm were in good order when this rotation commenced, and the land regularly sown with red clover when in wheat, and plaistered the spring when the clover was sown, and the plaister repeated the next year, and a sufficient stock kept to convert all the offal of the corn and wheat into manure it is possible that the land would not be rapidly injured. If this course were observed, the materials for making manure would be so abundant, there is no question it could be made in large quantities, the whole produce of the farm contributing to it; upon this plan much reliance must be placed upon soiling, which the experience of many years has taught me is a precarious dependence in this climate. I am far from recommending this rotation except upon rich bottom land; but if it be pursued, I do recommend it upon the plan here suggested, with the addition of some provision of grass land for early and mid-summer pasture. One-twelfth part of the most suitable land on the farm cannot be more beneficially employed than in this way. I consider cattle and hogs as an essential to every farm, not only for the purpose of making the manure necessary for the farm, but as the only means of supplying the country with food from our own resources. A farmer should buy nothing that he can make or raise for the use of the farm. If where the three years rotation is practised, the farm should be thrown into four divisions, and one of them is kept in grass for pasture, and thrown out of the rotation for several years, the land may possibly improve in fertility, if there should be proper exertions to make and apply manure.

Four years rotation

Admits of greater variety in the succession of crops. The course most approved in the country below the falls of the river, which is generally denominated the corn country, from that grain being considered the staple of that district, is corn, wheat, and two years in clover. Its effects I have had no opportunity of judging of; it is recommended in such strong terms by the president of our Society, that I can have no doubt of its advantages in that tract of country which is better adapted to corn than to wheat. It gives a greater proportion of corn and less of wheat, than I have been accustomed to make, or than it is advisable to attempt in a broken stony country, inconvenient to market, and where manual labour does not abound. In a tract of country above the falls, and below the Blue Ridge, wheat is considered the staple. An increase of the quantity of corn is no compensation for a diminished crop of wheat. One-fourth of a farm in wheat, and that after corn, when the crop is always worse than after fallow, is not considered enough. I once cultivated a plantation in a rotation of four years. My course was corn, wheat, clover, wheat, and the plantation evidently grew worse. I should remark, that during that experiment, the fields were not pastured, nor was I very successful with the clover crop, it having failed more than once. Three crops of grain in four years are too many for any high land. If the plantation had been laid off in five fields, and one field had been alternately thrown out of the course,

as suggested in the three years rotation, the benefit to the land and to the stock from a portion of the land being for a number of years in grass would be attained. So far as my experience or observation goes, wheat may succeed clover with every prospect of a good crop. Sir John Sinclair, however, states it to be the opinion of many of the most intelligent and successful farmers in Scotland, that clover land ought not to be sown in wheat. There may be some difference in the climate or soil of the two countries, that may make the difference upon this subject. However, it is proper that every judicious man should be on the look-out, as our experience has not been such as to be conclusive. When this rotation is practised, I would pasture moderately the clover field the last year it is in grass. In every rotation where the land is to remain not more than two years in grass, I am decidedly of opinion, that clover-seed should be sown on every crop of wheat, at the rate of a bushel of clean seed to ten acres. The cost of the seed is no consideration in comparison with the value of the crop or the improvement of the land from it. Many people believe, that after clover is once well taken, it is unnecessary to sow again; land will sometimes re-seed itself, but it will more frequently fail. The famous Norfolk four years rotation, which has made that one of the most productive counties in England, is turnips, barley, clover, wheat; the land always manured for turnips, and the turnips fed off by sheep, which is a dressing twice in four years.

Five years rotation.

This is the rotation practised by Mr. Wickham upon his highly cultivated and productive estase upon James river. Its success recommends it highly on rich land. It has been in use for seventeen years; during that time his crops have been the best upon the river, and from what I hear, the average of the last nine years is at least double the first term. I have repeatedly seen his crops of wheat and clover from May to harvest, and I have no hesitation in saying, that they are the best, taken throughout, I ever saw. I have seen in other plantations, lots and parts of fields that were equal to his, but I never saw entire fields under as good crops, either of wheat or clover. Before this land came into his hands, it had been cropped in the three years rotation. The succession of crops in his rotation is, 1st corn, 2d wheat, 3d clover, 4th wheat, 5th clover. I consider his experiment as establishing, conclusively, that by the free use of plaister of paris, and the proper exertions to make and apply manure, that five years rotation may be relied upon to give fine crops on lands in good heart, and to keep the land in a state of regular and progressive improvement. Although the number of acres that are in grain by having six divisions instead of five, would be fewer, I believe the quantity made would not be lessened, and I am confident the land would improve faster, with the advantage of summer pasture for stock, and the diminution of labour in seeding only one-third of the farm, instead of two-fifths, with the further advantage of commencing, whenever the extra field was to be brought into the rotation, with a naked fallow; which I fear will be found indispensable. From the increase of strong perennial plants upon our lands, since they have been less frequently than formerly planted in corn, I suspect we shall be obliged to resort to naked fallow once in six or seven years to keep them clear enough for wheat. For these reasons I should prefer six divisions; the sixth field I would use as it is proposed the fourth and fifth should be used in the two preceding rotations, to be sown with a mixture of grass seed for pasture.

Six years rotation.

1st corn, 2d wheat, 3d clover, 4th wheat, 5th clover, 6th clover; this course of crops may be practised to great advantage upon weak or worn lands. It may be varied thus: divide the arable land of a farm into three fields, one of which for corn and clover in equal parts, one in wheat, (half corn and the other half fallow,) and one in clover. Under this course one-sixth of the farm would be in corn, one-third in wheat, and one-half in clover. That part of the clover that is in the inclosure with the corn, to be mowed for hay, and the produce of the field that is in clover to be applied to the support of stock in summer, by soiling and by being pastured.

Seven years rotation.

1st corn, 2d rye, 3d clover, 4th wheat, 5th clover, 6th wheat, 7th clover. Perhaps

as beneficial a rotation with a view either to profit or improvement would be, 1st corn, 2d rye, (the corn and rye to be consumed on the farm,) 3d clover, 4th wheat, 5th clover, 6th wheat, 7th pasture for six years, on which I would sow greensward, orchard and herds grass, meadow oat and red clover. It will be remarked, that in this rotation the last crop in the course is wheat, and the first and second corn and rye, being three crops in succession. It is supposed the land would be amply compensated for this by the entire crops of rye and corn being consumed on the farm, and each field in its turn being in pasture six years. Where one-seventh of the land is manured for corn, the produce of two-fifths of the land that is in grain consumed upon it, and three-sevenths of the farm in grass, there can be no doubt of produce and improvement sufficient to satisfy any reasonable man. I am informed the lands on the south branch of Potowmac are cultivated in corn six, seven, and eight years in succession, after which they are pastured as long, and in that time are supposed to be completely renovated.

Of the foregoing rotations, I should prefer the five years rotation for good land, but think it would be more perfect, if the farm was thrown into six divisions and one of them kept in grass the whole round. For weak or thin land, I should think the change I have suggested indispensable. With that variation one-half the land would be in grain, and the other in grass.

To avoid repetition, I have purposely omitted mentioning tobacco, not from a belief that its culture should be abandoned; on the contrary, I think it will be long one of the best articles of produce for a Virginia plantation; at anything like the present prices, it unquestionably is so. Persons distant from market, or those who can make tobacco of the first quality, will probably find it to their interest to continue its culture for a great length of time. If it is made upon old land, it should be planted upon the lands that in the different rotations I have given, are allowed for corn. It will be found an easier crop to the land than corn, and will invariably be succeeded by a better crop of wheat.

Miscellaneous Observations.

It is obvious, that at the commencement of an improving system upon an exhausted farm, or upon poor land, it is proper to begin with gentle rotations; when the soil is improved, it will bear more severe cropping.

By the high price of wheat, farmers have been induced to cultivate too much land in grain, and there is reason to believe, that stock, the great source of manure, being neglected or almost given up, the soil will be exhausted by the severity of cropping. The late change in Europe to a state of profound peace, must cause the price of grain to fall, which, added to a decrease in the produce of the land, must bring distress upon the farmer; stock of every kind must rise on account of its scarcity, a circumstance which cannot be remedied for many years. The ready answer given by every man, when he is asked why he works his land so hard, is, that he must have the crop from all the land he cultivates, that less will not support his family and defray his expenses. Great and weighty considerations, I admit; but is it not a fatal error to believe, that one hundred and fifty acres of land, in an exhausted state, will produce more than a third, or at any rate half, the same land, well cultivated and improved by the manure that can be made, the free use of plaister and clover, and the proper mixture of ameliorating with exhausting crops? Let these questions be tested by experience.

John Wickham, Esq., when he purchased his upper farm, I understand, could not expect more than from two thousand to two thousand five hundred bushels of wheat, annually, according to the season. His crop is now from four to five thousand bushels. Thomas Marshall, Esq., took possession of his estate, when two and a half barrels of corn, and five or six bushels of wheat to the acre, would have been thought good average crops; he now makes from six to eight barrels of corn, and from fifteen to twenty-five bushels of wheat to the acre. For these facts many of the members of this society can vouch. Little more than half Mr. Wickham's land, produces more than double the grain he used to make upon two-thirds. Mr. Marshall has been equally successful. I hope those gentlemen will favour the public, through this Society, with a full statement of their improvements. Sir John Sinclair says that the lands in some districts in Scotland, were formerly cultivated in grain, three years in

four; the rent was then from twenty-five to thirty shillings per acre; the same lands are now in grain not oftener than three years in six; they pay from five to six pounds rent, and make more grain from half than they formerly did from three-fourths of the farm. These great and important changes have been made in Scotland, in about forty years.

A safe rule by which to proportion the crops of grain, is, not to suffer more than from a half to three-fifths of the farm to be in grain in one year. Let the land that can be manured, be the limit of the corn crop, to be succeeded by wheat, rye, or oats, according to the soil, and the relative value of each species of grain, and then complete the rotation by alternate crops of small grain and clover, allowing one field to be always in grass for pasture. I fear many farmers will be deterred from following this advice, from a belief that it is impracticable to accomplish what I propose. I pledge myself that any man who will make proper exertions, may make the quantity of manure that will be necessary. A farm of three hundred acres in six fields will have six of fifty each; twenty loads of forty bushels to the acre, will require a thousand loads for a field, to be spread over the surface equally. If the manure be applied to the hill or the drill, one-fourth of the quantity will be sufficient for the corn crop. The application in either mode will give from two hundred and fifty to three hundred barrels of corn from the fields, as the year is favourable or otherwise, in one of these modes. I know it is in the power of every man upon such a farm, to manure fifty acres; if he will provide winter and summer food for his stock, and use due diligence in making and saving manure, and consume all his wheat straw and corn stalks as litter for his stock.

In this way, then, half the land will be made to produce the quantity of corn usually made, with a great saving of labour, a certain and constant improvement of his farm, and a crop of wheat, double what he would make, when one-third of his land was planted in corn, and all his wheat made upon corn land.

The nature of the soil should have the greatest influence in deciding upon the crops to be made. In most cases, that crop will pay best, that the land is best adapted to. If the distance from market is too great to transport grain of any sort, still it is made to great profit, for fattening stock and for distillation. On the south branch of Potowmac, corn is the principal crop. Where the lands are peculiarly adapted to corn, let that be made the staple; so as to wheat, and every other plant which is cultivated. Upon the dry, thirsty uplands of the mountaineous country, corn is as precarious a crop, as wheat is upon the light lands of the lower country.

The great error in Virginia, heretofore, has been, that we have cultivated our lands without intermission; that we have attempted crops without any attention to the quality of the land, or the fitness of its culture; that we have taken everything from the soil, without returning anything to it, and that even now, when there is a strong solicitude to improve our lands, we are attempting it in a way that cannot succeed. I believe that by the due application of plaister, and the proper mixture of clover crops, if the clover succeeds, good land may be kept in heart; but if our lands should tire of clover, or become clover-sick, as has happened in other countries, this resource will fail. Is there any man so credulous as to believe, that by clover and gypsum alone the gullied and exhausted lands of Virginia can be reclaimed? I believe not; if there should be, I can assure him he will be disappointed. Before clover will perform its office, the land must be made capable of holding and sustaining it; nothing but manure will enable such land to do this; and to have manure, there must be stock on every farm, with a sufficiency of food for winter, and pasture for summer. Soiling for some time, may be practised to advantage, but it is not to be relied upon in this dry, hot climate, with any certainty for more than two months, and can scarcely be practised at all in the harvest month from the middle of June to the middle of July; because the farm hands are fully employed in securing the grain crops. Instead, then, of excluding stock from our farms, they should be considered indispensable, not only for the purpose of making manure, and for the necessary supply of the farmer, his family and labourers, with meat, milk and butter, but as a means of affording income. Instead of Virginia having a surplus of meat and horses, as she ought to have, our supply is drawn to a very

serious and alarming amount from other States. A vast proportion of the beef and pork consumed in our towns, and much of that which is used in the country by the farmers, is brought from other States. I am sure it is a reasonable estimate to say, that Virginia has paid, in the last five years, to the people of the Western country and North Carolina, not less than a million of dollars a year for cattle, horses and hogs, nearly one-fifth of the value of our tobacco crop, thereby impoverishing the people, as well as the land of Virginia.

I have no scruple in saying that at this day, there is less pasture land and less stock in Virginia, in the country east of the Blue Ridge, than there was thirty years ago. I must not be understood to approve of the ancient management of stock and pastures, when the stock was permitted to roam over the plantations, during the winter, and poach the earth, nibbling every atom of herbage that escaped the frost, and snatching every particle of the spring growth, as fast as it was high enough to enable them to bite it. Under this management, the land was injured and the supply of food inadequate; the stock miserably kept through the winter, a great loss in the spring of every year, half starved through the summer, and the manure from them at all seasons, small in quantity and meagre in quality. Instead of which, I recommend the forming of lots for the spring use of milch cows, yearling calves, mares and colts, and ewes and lambs; the more hardy stock to be kept upon dry food until the woods will sustain them, which they will do for two or three weeks in all the upper and most of the lower country; after which, towards the middle of May, the common pasture of the farm may be used, and soiling commence. One-twelfth or fifteenth of the farm of suitable land, in three or more grass lots, on a farm of any size, to be soon in greensward, orchard and herd's grass, meadow oat and red clover, will be of as much value as the same number of acres, in any crop, deducting the expense of culture, that ought to be charged to either grain or tobacco. When the common pasture is open to stock, or when it shall be sustained by soiling, the lots to be shut up for summer use—after the first of September there is never a want of pasture. From that time until March, the lots should not be depastured; the fall growth will be very considerable, which will be valuable food in March and April, the top of it only being injured by the frost. Where there are two fields of clover in the rotation, perhaps a better use for the land cannot be made of one of them, than to pasture with stock with due caution. Exclude everything until the clover is in full bloom, continue the stock upon it only long enough to make way for the second crop, excluding them always when the land is wet. There is no stock on a farm more benefitted by clover, or less injurious to it or the land, than hogs. Except for the comfort of resting themselves in wet or moist places, in very hot weather, hogs will not root, particularly when the land is dry, if they can get plenty of food without it. They have the ability to procure sustenance in that way, but I am satisfied it is only necessity that makes them resort to it. By using one of the divisions of a farm for pasture, with the aid of lots, I am satisfied that as much manure may be made and applied every year to the field in corn as will make it a fine crop; that horses enough may be raised in Virginia for our own use, and that instead of purchasing a great proportion of the meat we consume, in a very few years, we should have a considerable quantity for exportation.

Here I beg leave to call the attention of the Society to the effect of fattening stock on the farm, with a proportion of its produce. It is to make the land more productive in everything from the vast quantity of the rich manures it affords, which imparts its fertilizing power to every part of the farm in its turn. If the crop of corn is consumed by cattle on the farm, there is no question but that the subsequent crops, both of corn and wheat, will be increased, by the application of the manure it will furnish, which excess may, of itself, pay a good price for the corn so consumed. If, in addition, you can obtain a fair price for the corn, by the fattening of cattle, with a saving of the trouble and expense of its transportation, the farmer would be doubly paid. I am warranted in recommending feeding stock by the success of the South Branch farmers, who have become in thirty years, the most wealthy in Virginia, by the culture of corn, without ever having exported from the district, one bushel in grain; the whole crop being consumed on the respective farms. In Great Britain, the advantage and propriety of this prac-

tice are so fully understood, that there is never more than from one-third to half their farms appropriated to grain. The vast product of potatoes, turnips, cabbages, and grass are applied to the feeding of stock *on their farms.* In this way they believe, and I have no doubt of the fact, that they make more grain than they would do if a greater proportion of the land were made to produce it. In England, this practice is carried so far, that oil-cake is purchased and used for fattening cattle, with a knowledge that its chief benefit is derived from the richness it imparts to the manure, made by the cattle to whom it is fed.

The wisdom and economy of making as much grain upon twenty acres of land as they formerly made upon fifty, are there fully understood, and they are so rational as to believe it is better to have their farms improving than decreasing in fertility—and this is done by men who have only a short and temporary interest in the land, while we, the people of Virginia, who pride ourselves in being the lords of the soil, show so much indifference to its preservation. It is believed, and I fear justly, that our climate is unfavourable to the product of potatoes and turnips, which I consider a misfortune; but it is not pretended that either our soil or climate is at all so, to carrots, parsnips, scarcity, Jerusalem artichokes, or the sweet potatoe, cabbage, rape, or Swedish turnips. We have a great resource, too, in pumpkins, not less valuable for the quality of the food, than any of the roots, and only made so by the time at which they must be consumed. Much of our grain, both corn and rye, might be fed to great advantage, by being ground and fed on cut straw, or steamed, and perhaps more profitably than to sell it in grain, at the common prices.

The benefit to the farmer and to the land, from feeding stock, is so well understood in Great Britain, that it has become an agricultural maxim, that whenever a farmer discovers he can be as well paid, by cultivating food for cattle as for man, he should prefer it, because of the increased quantity of manure it gives. Mr. A. Young remarks, that "that country, that farm will be most improved, and most productive, upon which the greatest quantity of cattle and sheep are kept. This holds good, of an acre, a field, a farm, a district, a province or a kingdom."

By providing food for a due proportion of cattle, hogs and sheep, the quantity of grain will be increased, and the "meat, cheese, milk, butter, wool, and leather, are so much additional produce gained from the land; by means of which the wealth of a country and its power of providing for a numerous population, is enormously increased."

I trust there is no possibility of my being so far misunderstood as to have it supposed, that it is my desire to convert all our arable into grass land, or that I wish to increase the quantity of grass by diminishing the product of bread-stuff. I recommend stock as an auxiliary, whose agency is to be made to contribute to the increase of the grain crop, and to be subservient to that object. It is essential to the utility and chance of profit from stock, that they should be abundantly fed through the year, and the quantity of stock kept proportioned to the food *provided;* remembering always, that it is better for every person that a farm should be under than over stocked. In the neighbourhood of my estate in Albemarle, we have no resource for the summer support of cattle, but those furnished by our arable lands. We are without swamps or marshes, and we are so fortunate as to be able to cultivate all our cleared lands in succession. I do not believe within eight miles of Warren, there are fifty acres of waste uninclosed lands. Under these circumstances, we must abandon stock or depend upon what can be derived from the farm by pasturage and soiling.*

W. C. NICHOLAS.

* The following is an extract of a letter from a gentleman of the first respectability, who is distinguished as a farmer, and who has improved highly a tract of land that had been very much exhausted. It is published to corroborate my opinion of the importance and value of stock, both with a view to the improvement of a farm and the profit to be derived from it:

"I regret that it is not in my power to give anything like a satisfactory account of the ancient mode of cultivating the soil which it has fallen to my lot to manage. The modern and more improved mode of farming had already been adopted in part, when I came here to reside. The plowing, however, is deeper now, and better executed than formerly; plaister of paris is used in greater abundance, and more manure is carted out upon the fields. Not long

From the New York Observer

Lecture on Stock Feeding.

At a late exhibition of the Highland Society's Show, of Scotland, Dr. Anderson, the Society's Chemist, during an able lecture on Stock Feeding, made the following remarks:

"All branches of agriculture are now going through this phase of existence, and principles are being gradually established. The feeding of stock is exactly one of those subjects which can be most successfully advanced by studying the principles on which it depends; and though these involve many most complex, chemical and physiological questions, we have obtained some foundation on which to go. The food which an animal consumes is partly assimilated and partly excreted, but, if it be properly proportioned to its requirements, its weight remains constant, and hence we learn that food does not remain permanently in the body. If, now, an animal be deprived of food, it loses weight, owing to the substances stored up in the body being used to maintain the process of respiration and the waste of the tissues. The course of events within the body is, so far as known, somewhat of this kind. The food is digested, absorbed into the blood, a certain quantity being consumed to support respiration. If the food be properly adjusted to the requirements of the animal, its weight remains unchanged—the quantity absorbed and that excreted exactly correspond to one another; but if we increase the food, a part of the excess will be deposited in the tissues to add to its weight. Now, the quantity absorbed depends upon the state of the animal—a lean beast thoroughly exhausting its food, while, when it is nearly fat, it takes only a small proportion. So, likewise, if the quantity of food be greater than the digestive organs can well dispose of, a certain quantity escapes digestion altogether, and it is practically lost.

"The problem which the feeder has to solve is, how to supply his cattle with such food, and in such proportions, as to ensure the largest increase with the smallest loss. In solving this problem we must, in the first place, consider the general nature of the food of all animals, the constituents of which may be divided into three great classes—the nitrogenous matters, which go to the formation of flesh; the saccharine and oily, which support respiration and form fat. It is sufficiently obvious that as the two great functions of nutrition and respiration must proceed simultaneously, the most advantageous food will be that which supplies them in the most readily assimilable forms, and in proper proportions. In regard to the first of these matters, it will be obvious that if two kinds of food contain the same quantity of nutritive matters, but in one they are associated with a larger quantity of woody fibre or other non-nutritious matter, the latter will have considerably less value than the former. The necessity for a proper balance of the two great classes of nutritive constituents is also sufficiently obvious, for if, for example, an animal be supplied with a large quantity of nitrogenous matters, and a small amount of respiratory elements, it must, to supply a sufficiency of the latter, consume a much larger quantity of the former than it can assimilate, and there is practically a great loss. We may determine the proper proportion of these substances in three different ways: 1st, we may determine the composition of the animal body; 2nd, we may examine that of the milk, the typical food of the young animal; and 3rd, the results of actual feeding experiments may be examined. But, however valuable the data derived from these experiments may be, they are less important than those derived from actual feeding experiments. In fact, it by no means follows that the proportions in which the different substances are found in the

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after my arrival, my stock of cattle was considerably diminished, with a view to give the land as much as possible the benefit arising from clover considered as a mere manure. For five or six years I have been nursing my land carefully, and have had some very poor fields to reclaim; but I am now able to fatten 50 or 60 beeves annually for market, without sustaining any inconvenience; indeed I consider the grazing of those fields which I propose to fallow in any given year, as a decided advantage; because I am enabled by this means, to have the plowing executed more effectually, and to prepare a good seed bed for the wheat. The surface of our country is much broken and exhibits many poor knolls, where improvement has not progressed far, which are not only a great detriment to the appearance, but a material drawback upon the produce of our wheat fields. Upon some of those spots I have been in the habit of having my farm cattle penned every night, and others I have endeavoured to cover with manure. The results have been in every way satisfactory."

animal are exactly those in which they ought to exist in the food. On the contrary, it appears that while one-tenth of the saccharine and fatty matters are assimilated by the animal, only one-twentieth of the nitrogenous compounds, and one thirty-third of the mineral substances in the food are assimilated by the animal. On the other hand, however, it must be remembered that the particular compounds also exercise a very different influence. Thus a pound of fat in the food, when assimilated, will produce a pound of fat in the animal; but it requires about two and a-half pounds of sugar and starch to produce the same effect. The broad general principle arrived at is, that we must afford a sufficient supply of readily assimilable food, containing a proper proportion of each class of nutritive substances. But there are other matters also to be borne in mind, for the food must not only increase the weight of the animal, but also support respiration and animal heat; and the quantity of food required for this purpose is large.

"It appears, from Boussingault's experiments, that in a cow, eighteen ounces of nitrogenous matter are required to counterbalance the waste of the tissues—a quantity contained in about ten or twelve pounds of wheat flour; and it is well-known that an ox expires four or five pounds of carbon daily, to supply which one hundred pounds of turnips are required. We see from this the large quantity relatively to that used up, which is required for the maintenance of these functions, and the importance of adopting such measures as, by restraining them within the narrowest possible limits, produce a saving of food. The diminution of muscular exertion, and keeping the animals warm, so that a small quantity of food may be required to act as fuel to maintain the animal heat, are the most important considerations. Although the presence of a sufficient quantity of nutritive matters is an essential qualification of all foods, their mechanical condition is not unimportant, for unless its bulk be such as to admit of the stomach acting upon it properly, there must be an appreciable loss; and there is no greater fallacy than to suppose that the best results are to be obtained by the use of those which contain their nutritive matters in a very small bulk.

"As a practical question, the principles of feeding are restricted to determining how the staple food produced on the farm can be most advantageously used to feed the cattle kept on it, and on this point much requires to be said. It appears that they can be best made use of when combined with more highly nutritious food such as oil-cake or rape; and, when this is properly done, a very great advantage is derived. It appears from experiments that sheep, which, when fed on hay only, attain a weight of ninety pounds, reach a hundred when rape is added. The subject cannot be completed without referring to the value of the dung produced, which has been variously estimated."

The experiments referred to in the course of the address, appear to show that, of food generally, about one-third to one fourth of the money value, and seven-eighths of the valuable matter, appear in the dung. Dr. Anderson concluded by saying that he had by no means attempted to exhaust but had given only a sketch, trusting that the observations of others might fill up the details.

Form and Action of Saddle Horses.

When a horseman sits on a good roadster he need not take the trouble to pick his way when riding down a rough country lane or over broken ground, because the fore feet of a clever saddle horse, be the pace walk, trot or canter, are always well forward and fall flatly and evenly on the ground and when in action the fore legs are sufficient but not too much bent, the action coming direct from the shoulders. But the most agreeable feature experienced in riding perfect saddle horses is, the ease and elasticity with which they move in all their paces thereby sparing the rider any feeling of fatigue. Not only is the number of hacks and hunters very limited, but those we have—except a few in the hands of masters of hounds and members of hunts—are too apt at an early age to display some of the infirmities to which their race are now so subject, in the shape of curbs, splints and spavins, consequent upon the hurry the breeders are in to bring them into the market before they arrive at a proper working age. Thousands of capital saddle horses are annually sacrificed from this very cause. I partly attribute the downward tendency of our breed of saddle horses, to the rage for speed, which is now so prominent a feature

on the English turf; but when we take into consideration what long considered and careful selection on our turf has effected, when the sole object was speed, we may reasonably anticipate as important and beneficial results from equally judicious selection, when our object is to produce horses possessing that fine union of qualities so essential to good saddle horses.

There are a few people who know what constitutes good shoulders in a horse—a good many asserting that they should *fine*, meaning by this, lean at the withers. It is, however, certain that the shoulders of a young horse, intended to carry weight, can hardly be too thick at that place, provided they are not too thick at the points or the lower ends, while inclining their tops well back, and leaving a good space between the end of the mane and the pommel of the saddle. There is a certain cross-beam which connects the lower end of the shoulder blades with the horse's fore legs, which very materially affects his action. When this is too long it throws the fore legs too much back, causing the horse to stand over like a cart-horse; and such an animal, besides being unpleasant to ride, when at all tired, is very likely to come down. I am here stating what is well known to good judges, but I write for the many. I would also observe that the form of shoulders I here recommend only *contribute* to good action, they alone do not *secure* it. Good hind-leg action is as important as good action in the fore legs. The hock joints should bend well, when in action, bringing the hind feet well forward, but without striking the fore feet, commonly called over-reaching.

It is a common practice to pay little attention to the action of the hind legs, so long as the horse possesses what is termed "fine knee-up action;" but all superior horses, of whatever breed, are eminently characterized by good hind-leg action; for be the shoulders ever so good, unless the action of the hind legs are also good, the horse is uneasy to ride, because the action of the two sets of legs are not properly balanced, and, no matter how accomplished the rider may be, it is with difficulty he can accommodate his seat to the action of such a horse. Such a horse is unsafe to ride, and his rider, if a judge of action, feels that he is so; but if the action of the hind or fore legs be properly balanced, the rider feels his horse firm under him, and that he cannot very well come down. Indeed, in this case he seems to be riding *up hill*, while under opposite circumstances, he seems to be riding *down hill*. One important point which I consider has been gained by the breeding of horses for speed is, the great length between the hip-bone and the hock, as exhibited in the grey-hound; and although the possession of this point is not so absolutely necessary, yet I, for one, should be inclined to give its possessor the preference for a hunter of the present day, for the horse either is, or ought to be, capable of great speed. But our hunter had not formerly this shape, and did not so much require it. There is, however, one objection against any *excessive* length between hip and hock, which is, that it frequently causes over-reaching, a most disagreeable infirmity for either hunter or roadster. A horse's hips should be wide, to carry weight, and his loins highly muscular, but the lower ends of his shoulders should be light. His chest cannot be too full, but it may be too wide for speed, as well as for agreeable action, causing a rolling motion, very unpleasant to the rider.

Great depth of chest is a powerful recommendation, and the ribs before the girths cannot be too long, but the back ribs (when much speed is required) should be rather short. For very fine action, the shoulder-blades must be long, while they cannot be so without inclining well back. If a horse so formed has good hind-leg action, he will be very valuable as an active weight-carrying cob, because this form of shoulders is, I regret to say, now rarely to be found among our saddle horses, as in the majority of them that come within the pale of a moderate price, the girths are continually slipping forward, causing the rider to sit on the horse's withers rather than on his back; and this is one cause of horses falling down, as the weight of the rider pressing on the top of their shoulders seriously interferes with their free action, and when they make a slight tumble it is next to impossible to recover their feet. The best height for horses intended as hacks of the first class, is about 15 hands. Tall horses are not so good for hacks as those of lower stature, as they do not move with so much ease and lightness, wearing their legs more, and causing more fatigue to their rider. The majority of tall horses are now-a-days tall only because they have long legs, which are very objectiona-

ble, as they never wear well, and are mostly allied with a very shallow body. These horses may do well enough when a showy appearance is the only object in view; but they are not calculated for hard work, or to ride in hilly country. I may dismiss this subject by remarking that I would not advise the purchaser to reject a horse just because he does not happen to possess all the good qualities I have here recommended, as they will remember the old adage, "That there never was a perfect horse."

London Review.

From the Rural Register.

Bone Earth.

We are anxious to see a more general use of crushed bones, as we believe that they are the most valuable manure (so far as permanency is concerned) that can be used on most crops. The following from Prof. S. W. Johnson, to the Connecticut Agricultural Society, will be read with interest:—

Having lately been asked by several agriculturists if there is any method known of bringing whole bones into a pulverized condition, otherwise than by grinding or treatment with oil of vitriol, I take the opportunity to communicate to the members of the State Society the process of reducing them into a convenient form by *fermentation.*

This process has been practiced in England, for ten years or more, having been brought before the public there by Mr. Pusey, for many years the editor of the Journal of the Royal Agricultural Society, of England; but it appears not to have become very widely known in this country.

The process depends upon the fact that bones consist, to the amount of one-third their weight, of cartillage, or animal matter, which under the influence of warmth and moisture, readily decomposes, (ferments or decays), and loses its texture, so that the bones fall to dust.

From the closeness and solidity of the bony structure, decay is excited and maintained with some difficulty. A single bone, or a heap of bones, never decays alone, but dries and hardens on exposure. If, however, bones in quantity be brought into *close contact* with some easily fermentable moist substance, but little time elapses before a rapid decay sets in.

So too, if fresh crushed bones are mixed with sand soil, or any powdery matter that fills up the spaces between the fragments of bone, and makes the heap compact, and then are moistened with pure water, the same result takes place in warm weather, though more slowly.

The *practical process* may be as follows: The bones if whole, should be broken up as far as convenient by a sledge-hammer, and made into alternate layers with sand, loam, saw-dust, leached ashes, coal ashes, or swamp muck, using just enough of any one of these materials to fill compactly the cavities among the bones, but hardly more. Begin with a thick layer of earth or muck, and as the pile is raised, pour on stale urine or dung-heap liquor enough to moisten the whole mass thoroughly, and finally, cover a foot thich with soil or muck.

In warm weather the decomposition goes on at once, and in from two to six or more weeks the bones will have nearly or entirely disappeared.

If the fermentation should spend itself without reducing the bones sufficiently, the heap may be overhauled and built up again, moistening with liquid manure, and covering as before.

By thrusting a pole or bar into the heap, the progress of decomposition may be traced, from the heat and odor evolved.

Should the heap become heated to the surface, so that ammonia escapes, as may be judged by the smell, it may be covered still more thickly with earth or muck.

The larger the heap, the finer the bones, and the more stale urine or dung liquor they have been made to absorb, the more rapid and complete will be the disintegration.

In these heaps, horse-dung or other rapidly fermenting manure may replace the ashes, etc., but earth or muck should be used to cover the heap.

This bone compost contains the phosphates of lime in a finely divided state, and the nitrogen of the cartilage, which has mostly passed into ammonia or nitrates, is retained perfectly by the absorbent earth or muck.

When carefully prepared, this manure is adapted to be delivered from a drill-machine with seeds, and according to English farmers, fully replaces in nearly every case, the superphosphate made by help of oil-of-vitriol.

Yale Analytical Laboratory, Nov. 22d.

From the Boston Cultivator.

On the Culture and Use of Root Crops.

Messrs. Editors :—The business of raising roots in our country may be fairly said to be as yet in a state of infancy, when we come to compare the amount raised with what it is in many foreign countries. It may also be fairly argued, that we can never expect to cope with other countries in this branch of husbandry, owing in part to the enhanced price of labour with us, and possibly, in part, that our climate is not as favourable to their growth, owing to its lack of humidity. Still there is not the slightest doubt in my own mind, but that we can profitably increase the amount of this species of animal food in a large ratio. The farmers of our region are loth to think that the fields from which an annual crop of a ton or two of hay per acre has been taken from time immemorial, can by proper tillage and judicious fertilizing be made to produce in a year or two just ten times the same amount of good succulent winter food for his stock, though probably not as valuable as his hay, pound for pound; yet in the aggregate, no one will deny, vastly more valuable.

One advantage in raising this crop is, that they draw so large an amount of their sustenance from the atmosphere, and consequently, do not impoverish the soil to that extent that most crops of the same amount would be like to. The large broad leaves of the turnip show this especially, and I have yet to learn that a crop of roots exhausts the soil to a greater extent than a crop of corn or other cereal, while the produce of the former is immensely the greatest.

Another advantage in their cultivation is, that by giving so large a yield, that when fed out, and the manure thus made properly saved and composted, more good, fertilizing matter is obtained, I will venture to say, than from any other crop raised on the farm. A man cannot take the product of an acre of roots, say from 15 to 20 tons, and feed them to his stock in the most careless manner without adding largely to the pile in the barn-cellar or yard. This I look upon as one of the greatest advantages arising from their culture, and when persisted in for a term of years, cannot fail of showing its effects in the increased fertility of the soil.

Still another advantage is, that they come into use at a season when animals are deprived of food of a succulent nature, and seem to be just what the system needs at that period—acting in a measure as a corrective and alterative, keeping the bowels loose and in a healthy condition. Especially are their good qualities manifested when fed to cows about the period of parturition, when the animal stands in need of food of a laxative nature. The good effects of carrots are also shown when fed to horses in the winter, which are otherwise confined to dry feed, in giving them a fine, sleek coat, and a general healthiness of the system, acting with them both as a laxative and diuretic. For colts especially are they highly beneficial. Having thus endeavored to show something of the practicability of the system, let us look for a moment to their culture; and first, as to carrots:

For this crop, a soil that might be termed a sandy loam, sufficiently compact however to retain manure, and resting on a clayey subsoil, is preferred. A field that was cropped the previous season with corn or potatoes and *kept clean*, should be chosen. Fall ploughing and manuring is preferable, though perhaps not essential, provided the land received two ploughings in the spring. As early in the spring as the soil becomes sufficiently dry to work, in April, if possible, prepare the land by first giving it a good coat of manure, evenly spread and well pulverized. If you have both fine and coarse, use the coarse at this time. Plough to the depth of 12 inches, provided your land was previously in good tilth, if not, two or three inches less will answer, and be sure to see that the manure is well covered. If it is long and difficult to do this, have a man follow the plough and push it in the furrows, so it will not choke the plough. Twenty-five loads at least per acre should be applied at this time. Allow the land to remain as left by the plough until about the 20th of May, when it should be again ploughed at the same depth crosswise, if possible, after which a dressing of fine manure should be applied to the surface of at least 15 loads to the acre, (the amount limited only by the supply,) and well cultivated in. It doubtless will be superfluous to mention the importance of bringing the soil into fine tilth for this crop. Not less than half a dozen applications with a good long thirty tooth harrow, or what is much to be preferred, a good two-horse cultivator on wheels—such an implement as the farmers of

Western New York use in preparing their soil for wheat. The soil will need to be perfectly free from stones and lumps, as they are a great hindrance, both in the sowing and in after cultivation.

For marking out the land for the drill—which when the land has been thoroughly prepared, and in an as fine tilth as an onion-bed, it should be marked for the drills by a machine similar to an old fashioned horse-rake, having the teeth at suitable distances for the rows, and drawn by hand. The first rows can be made straight by drawing a line across one side of the field and allowing the outside tooth to follow it—and if at any time the rows become crooked, by using the line matters can become straightened out again. The proper distance for the drills to be from each other is about eighteen inches for carrots. Now, with your hand-drill, which should be first tried on a floor to see that it works well and discharges the proper quantity of seed, follow the marks carefully, and if your drill is provided with a good roller, as it should be, no other covering will be found necessary, but if no roller, it will be needful to go over them with one separate from the drill. The proper time for sowing in our locality, is from the 20th May to the 10th June, according to the earliness or lateness of the seed season. If sown quite late, however, they may be somewhat thicker, as they will not attain so great size.

In just about three weeks from the period of sowing, if the weather has been favourable, the plants will be up and of a proper size to begin the weeding, and now comes the tug of war! For if the first weeding is not seasonably and properly done, your crop is half ruined; indeed, two or three days procrastination here may cost you your crop. First, let a careful hand hoe between the drills as closely as possible, and the weeds in the rows must be taken out by hand, for there has not yet, in all Yankeedom, been a machine invented that could distinguish between a carrot plant and a weed. Beginners are very like to fail here, i. e., not to perform the weeding sufficiently early—for if postponed until weeds and carrots have both attained some considerable size, the plants will be very like to come out with the weeds. Care should also be taken here to get the roots of the weeds out, and not be content to allow the tops only to be eradicated. The second weeding usually comes from ten to twenty days from the first and should be performed in a like thorough manner. They will ordinarily need going over the third time.

The plants should be allowed to occupy the ground until about the first of November, as they make the most growth in the autumn months.

As to the best mode of harvesting, I think it is to take long-handled spades, not shovels, strike them in the earth as close as possible to the roots in a perpendicular position, and pry the roots just loose with one hand and with the other grasp the tops and jerk them from their bed. After a slight experience, this can be done in a more rapid manner than one would suppose, and with a good yield, one man will dig in this way, having other help to do the topping, one hundred bushels in a day. Have never made out much in the use of the plough in digging, as some have suggested. Caution must be taken not to dig more than can be topped and housed the same day, as they are very susceptible to frost. If as yet you do not possess that almost indispensable apartment to the root grower, the barn-cellar, but are obliged to store them at the house-cellar, drive to the outside door or gangway, and having laid some loose plank over the stairs, allow them to roll down this, which will tend to dispossess them of much of the loose dirt likely to adhere to them, and at your leisure, throw them back to the spot designed for their reception. A mound-shaped pile in the centre is best for a large quantity, and if the cellar is properly ventilated, and the roots put in in good dry order, which is all important, there will be no fear from heating in the pile. If, however, from any cause this should take place, it can be stopped by opening the pile and allowing the air to circulate more freely.

As regards the cultivation of the ruta baga, or Swedish turnip, the mode of culture is, in many respects, so similar, that only a few additional hints will be needed. A light clover sward of one year's growth on the clayey loam, requiring a somewhat heavier soil than the carrot, is perhaps best adapted to the growth of this esculent.

When the clover has attained its growth and is part in blossom, say about the second week in June, the land should be well turned over at a good depth—not less than ten inches—and fine manure applied at the surface, amount limited only by the supply,

and thoroughly incorporated with the soil by the use of the harrow; indeed, the extreme pulverization theory of Jethro Tull comes in play here, and nothing short of very thorough culture will answer. Mark with the machine as described for carrots, only let the drills be two feet distant from each other, and at this distance horse-labor may be used somewhat in their cultivation, either by the cultivator or horse-hoe—the latter preferred, if of the right kind.

As regards the amount of seed necessary, two pounds to the acre is about the right quantity, provided your machine distributes evenly, and, I should have stated before, two pounds of carrot seed per acre is used; more being better than less, but it must be stated, one advantage in raising the baga is, that vacant places can be readily filled in by transplating.

W. J. PETTEE.

We feel pleasure in saying, our excellent friend, the writer of the above essay, took the highest premium on farms less than fifty acres at the Connecticut State Fair in 1856, owing mainly to his success in root culture.

EDS.

The Common Pump.

In the year 1641, a pump maker of Florence made an atmospheric, or as it was then called, a *sucking* pump, the pipe of which extended from 50 to 60 feet above the surface of the water. When put in operation it was found incapable of raising the water to a greater height than 33 feet. The pump was examined for some defect in its construction; but being found perfect in that respect, it was again set to work, without any better success.

The difficulty having been submitted to Galileo for his advice and solution, and by him having been communicated to his pupil Toricelli, led to the discovery, by the latter, in 1643, that water is raised in pumps by the pressure or *weight* of the atmosphere, and cotemporarily, to the invention of the barometer.

Nearly every one now-a-days is acquainted with the fact that water can not be raised from a greater depth than 33 feet by means of the common pump: but suppose an artisan, who had been brought up in New York or London, and was perfectly familiar with this fact, should go to the city of Mexico, and there construct a pump with a pipe 33 feet in length, he would find, upon trial, that he could not raise the water within 10 feet of the surface: moreover, if he should go to Quito, or Santa Fe de Bogota, in South America, or to Gondar, the capital of Abyssinia, he would not be able to raise it more than 20 feet; while on the summit of the highest ridge of the Himalayas, he could scarcely raise it by the same means to the height of 10 feet.

Without a knowledge, therefore, of the *principles* upon which the operation of the pump depends, he would be likely to get involved in as great mistakes as the Florentine pump maker; and this simple case may serve well to illustrate the *value of science*, even in the simplest affairs of life, and its absolute *indispensability* in directing our operations under varying circumstances.

At the level of the sea, the atmosphere supports a column of water 33 feet high.
At 2¾ miles above the level of the sea, it will only support one 16½ feet high.
At 5 4-10 miles above the level of the sea, it will only support one 8¼ feet high.
At 8 miles above the level of the sea, it will only support one 4 feet high.

Artificial Manures.

As sulphuric acid is largely employed in making superphosphates and other artificial manures, the quality of this acid is a subject of considerable importance. Sulphuric acid in England and this country is chiefly manufactured from iron pyrites, in consequence of its greater cheapness; but it would seem that most of the pyritic sulphur contains an amount of arsenic equal to from one five hundreth to one eight hundreth part of the acid. This arsenic is taken up by the plants to which the manure is applied; and in a chemical analysis of vegetables so manured, the presence of arsenic is clearly detected. Prof. Davy, of Dublin, has recently called attention to these facts, and urges upon manufacturers of superphosphates the necessity of caution in the materials they employ, as arsenic is a cumulative poison which is sooner or later destructive to the animal system. He mentions an instance where sheep refused to eat turnips grown with superphosphates, evidently preferring those grown with ordinary farm-yard manure. The Professor recommends the total abandonment of sulphuric acid, made from pyrites, for any agricultural purpose; and, the substitution, instead of acid made from pure sulphur as, in his opinion, pyrites almost invariably contain arsenic.

This plan is actually adopted by many manufacturers of superphosphates who stipulate that the acid must be made from pure sulphur. All pyrites, however, do not contain arsenic. That of the "Belgian Pyrites Company, of Antwerp," has been repeatedly tested without ever showing a trace of arsenic; The Spanish pyrites are also said to be free from it. It is very desirable to have the pyrites, which are imported from different places, thoroughly tested, so that the manufacturers of artificial manures may be able to give satisfactory assurances that so pernicious an ingredient as arsenic is not contained in their otherwise useful productions, which are now so extensively employed.—*Practical Machinist.*

From the Farmer and Gardener.

Take Care of the Implements.

MR. EDITOR:—Examining a Mowing machine a few days since, I observed, painted upon a conspicuous part of it the words, "*Keep your Knives Sharp.*" The manufacturer had, I presume, learned to know that very many of the failures on the part of farmers to make their mowing machines work satisfactorily, proceeded from a want of attention to the injunction contained in the four words so conspicuously painted upon the machine. It seems strange that any such admonition should be necessary, but "facts are stubborn things," and it cannot be denied that too little attention is given to our implements, when in use, or when not in use. No nation expends so much money for implements as the American, and none are so careless of them. In fact, the purchase of improved implements is one of the heaviest taxes imposed upon us: but it is equally clear that we *double* our taxation in this particular by our abuse of them. The leisure season of the farmer is at hand, and this is the proper time, therefore, to direct their attention to this matter. Where shall they begin? With the first tool or implement they meet after reading this. If they have done with plowing and harrowing for the season, let every plow, harrow, and cultivator be taken to the implement house, presuming, of course, that every well-conducted farm is provided with one of these indispensables. Every shovel, hoe, spade, or rake should be similarly cared for, and the first leisure hour, or rainy day, appropriated to putting them in proper order for use at any moment. By this I mean, that every part of every tool should be carefully examined; every nut and bolt should be seen to; the adhering dirt should be washed from both iron and wood work; and this should be done before the bright or polished parts, as mold-boards, &c., begin to rust. Apply a little tallow or oil to these parts; procure some good oil paint, (the best is the cheapest,) and give a coat of it to every part of the wood-work. One coat of paint is worth half a dozen of varnish, at least such varnish as is usually applied to agricultural implements. Examine the mowing-machine knives, file or grind out the nicks, put a good edge on them, and after oiling them to prevent rust, lay them carefully aside. Remove all the gummed oil from the gearing and journals of your mowers, thrashers, corn-shellers, &c.; have the blunted harrow-teeth taken to the smith and pointed, and do not forget to have the plow-share laid anew, and the coulter or cutter of the plow sharpened. In a word, have every thing in such order that it will be ready when wanted. This, properly attended to, will save to one-half of our farmers one-half of the annual outly for implements. Try it for one season, and my word for it the system will be adopted by every one who has any disposition or desire to economise his expenditures. ABNER BROOKS.

From the Farmer and Gardener.

A Very Little More About Bones.

MR. EDITOR:—I promised in your first number, that I would probably have a word or two more to say about bones. True to my word, I wish to direct attention to a point which possesses some interest; and as my own mind is not at all clear upon the subject, perhaps some of your scientific readers will relieve my doubts. What I wish to know is, whether bones, after being boiled or burned, are as valuable for manure as the raw bone? We know that the analyses of scientific men give to the raw bone a value which the burned or boiled ones do not, and cannot possess. All the greasy, fleshy, and fibrous matter, of which boiling or burning deprives them, are regarded as valuable fertilizers, and it would seem but reasonable that when deprived of these ingredients, bone manure would be less valuable. Now, on the other hand, we have the practical experience of first-rate farmers, which goes

to prove that the burned or boiled bones are superior to the raw. Here science and practice are at loggerheads. Who shall decide? Who of our farmers have tested the matter and are prepared to report? We know that science is unerring. If it be science at all, it must be truthful. Science says raw bones are best; practice, or the results rather, of *some* practical experiments, makes an issue with science upon this point, and insists that burnt or boiled bones are superior to the raw. How are we to settle the dispute? Allow me to offer a suggestion. Both are right, I think, and both are wrong. The action of raw bones, which have not been deprived of their fat and gelatine, is less rapid than the burnt or boiled ones, hence the conclusions at which practice has arrived are based upon the more *immediate* action of the burned bones. Science, on the other hand, insists upon the truthfulness of her premises, and only asks a little more time for their verification. I do not offer this as an authoritative opinion, but simply ask a kind of compromise between the disputants, and with the hope that, if not correct, some of your learned readers will enlighten the rest of us on the subject. A. T. B.

10*th Mo.* 8, 1859.

How to Use a Horse.

It is not, after all, every one who owns a horse that knows how to use him, whether for his own pleasure or the horse's, which is, in other words, the owner's best advantage. Nor is it very easy to lay down rules how a horse should be used, considering the many different purposes for which horses are kept, the different natures and constitutions of the animals, and the different circumstances of their owners.

Horses may, in general, be divided into two classes—those kept for work, and those kept for pleasure. In the former class may be included farm-horses, stage, coach and omnibus horses, team-horses, employed in the transportation of goods, and moving heavy and bulky masses, carmen's horses,—and lastly, the road horses of all professional men, who, like lawyers, doctors of medicine, and the like, are compelled to drive or ride many hours *per diem*, regularly, in the performance of their business.

In the latter class may be included race-horses, match-trotters, private gentlemen's saddle-horses, carriage-horses, or roadsters, and many other animals belonging to business men, which being employed during half the time or more in actual service, are used during spare hours on the road for purposes of amusement.

With regard to the first class of these horses, the exigencies of the business to which they are applied are, for the most part, such as to supersede and override all rules. In some cases the natural hours of the day and night have to be reversed, and the animals are called upon to do their work by night, and to rest and feed by day. Under these circumstances, it may be laid down as an immutable law, that at whatever hour the horses are to be worked, they must have full time, beforehand, to digest their food and water; they must be carefully cleaned, and made comfortable; they must have sufficient intervals for halting and baiting, on the road, must be cleaned and well fed during the intervals of work, and must have ample time for undisturbed repose. The distance which horses in perfect condition can go upon the road, varies greatly with the powers of the animal, the degree of pains bestowed upon him, the skill of his driver, and the amount of his load, as well as the state of the roads. But it may be taken as a rule, that strong, able horses, of moderate speed, can travel forty miles a day, with a moderate load, without distress, for many days in succession. It may be observed, that it is the better way to start at an easy pace when on a journey, to increase it slightly in the middle of the day, and again to relax it before coming in at night, in order to allow the animals to enter their stables cool, in good order, and ready, after a short rest, and cleaning, to feed with an appetite.

It may also be observed, in this point of view, that it is a mistake to fancy that horses are benefited by being driven or ridden very slowly when they have a long distance to perform. If a horse have to get over forty miles in a day, the roads being good, the temperature of the day pleasant, and the load not excessive, he will do it with more ease and less inconvenience to himself, going at the rate of seven or eight miles the hour, and doing the whole distance in five or six hours, with a single stoppage in the middle of the day, to feed and rest, than if he be kept pattering along at the rate of four or five miles, and be kept out of his stable, hungry and thirsty, and leg-weary to boot, for a longer time.

Farm-horses, whose work is necessarily slow and continuous, lasting ordinarily from sunrise to sunset, with the exception of a mid-day halt for baiting, are under different circumstances. Their work being always slow, and rarely, if ever, severe, at the moment, or toilsome, except from its long duration, they need not be subject to the same condition as fast-working horses, of being fed long before they are put to work, and allowed to evacuate their bowels thoroughly before being harnessed. They may, therefore, be fed and watered at the last moment, and put to slow work immediately, and will rarely take harm from traveling on full stomachs. In the same manner, when they are loosed at noon-day, being rarely overheated, after a slight rest and a slighter rubbing down—which, by the way, they rarely receive—they may take their mid-day feed without delay, and without fear of evil consequences. In the like manner may be treated carmen's horses, and team horses, the labor of which is heavy and continuous rather than rapid All horses, however, whatever the work to which they are applied, should have ample time to rest at night, and should be thoroughly rubbed down, dried, clothed and made comfortable, before feeding them and closing the stables for the night,—and the more so, the more trying the day's work.

With regard to pleasure horses, which are usually in the stables, more or less, twenty hours out of every twenty-four, which are only taken out for the gratification of the owner at such times as it suits his humor or necessity, they should never be taken out or driven fast on full stomachs; which can always be avoided by letting the groom know, in case that they will be required at an unusual hour or for unusual work—when he can adapt his feeding hours to the circumstances of the case.

When harnessed and ready for a start, the driver should mount his seat quietly, gather his reins, and get his horses under way, slowly but gradually, by speaking or chirruping to them; never starting them with a jerk, or striking them with a whip,—allowing them to increase their pace by degrees to the speed required, instead of forcing it on a sudden.

It is far better for horses, to drive them steadily at a regular pace, even if it be ten or twelve miles an hour, than to send them along by fits and starts—now spinning them over the road at sixteen or eighteen miles, now plodding along at six or seven; and of two pairs of horses, driven the same distance, after the two different methods that which is driven evenly will, at the end of the day, be comparatively fresh and comfortable, while the other will be jaded and worn out.

In regard to punishment, the less that is administered the better. A sluggish or lazy horse must, it is true, be kept up to his collar and made to do his share of the work, or the free-goer will be worn out before the day is half done; and for this the whip must be occasionally used. Even good and free-going horses will occasionally be seized with fits of indolence, at moments, induced perhaps by the weather, and it may be necessary to stimulate them in such cases. Again, at times when roads are bad, when time presses, and certain distances must be accomplished within certain times, recourse must be had to punishment; as it must occasionally, also, in cases where the animals are vicious or refractory, and where the master must show himself the master. Still, as a general rule, punishment should be the last resort. It should never be attempted with a tired, a jaded, or an exhausted horse; for to apply it in such cases is an utter barbarity; little or no immediate advantage is gained to the driver, while it may probably result in the loss of an excellent animal. It is common to see horses punished for stumbling, punished for starting; and whenever a new horse, which one may chance to be trying, starts off into a gallop after committing either of these offences, one may be sure that he is an habitual starter or stumbler, and that he has frequently undergone chastisement for them, and undergone it in vain. It is altogether an error to punish for either starting or stumbling; the one is the effect of fear, which cannot be cured by the whip, the other, in most cases, of malformation or of tenderness in the foot, which certainly cannot be treated successfully by chastisement, which, in fact, aggravates and confirms, instead of alleviating or curing.

In speaking of driving at an equal pace, we would not, of course, be understood to mean that horses should be driven at the same gait and speed over all roads, and over grounds of all natures. Far from it. A good driver will, while going, always, at the rate of ten miles—we will say—an hour, never, perhaps, have his horses going at ex-

actly the same rate for any two consecutive twenty minutes. Over a dead level, the hardest of all things except a long continuous ascent of miles, he will spare his horses. Over a rolling road, he will hold them hard in hand as he crosses the top and descends the first steep pitch of a descent; will swing them down the remainder at a pace which will jump them across the intervening flat and carry them half way up the succeeding hill; and will catch them in hand again and hold them hard over the top, as we have shown before.

Horses in work should be watered about once, with not to exceed two quarts, after every ten miles, or every hour, if one be travelling fast; and if travelling far, they should be well fed once in the middle of their journey. This point, however, has been discussed already under the head of feeding.

In closing, we would say, always remember, in using a horse, that it cannot be done with too much coolness, too much gentleness, too much discretion, or too much kindness.

There is no better beast in the world than a horse, nor any one which, though often most cruelly misused by man, so well deserves, and so amply, by his services, repays the best usage. *Herbert's Hints to Horse-Keepers.*

Dying Hats and Feathers.

To Dye Straw Bonnets Black.—Suppose there are two bonnets to dye, one leghorn and one straw. Put an ounce of sulphate of iron into a vessel with two gallons of water; make the liquid boil, then put in the bonnets, and let them boil for one hour. Then take out the bonnets, and hang them on a peg to dry. When dry, rinse them in cold water. This portion of the process of dyeing is called mordanting, the liquor being termed the mordant. After the bonnets are thus mordanted, the mordant must be poured out of the boiling vessel, and two gallons of clean water made to boil in its place; into that liquor put half a pound of gall nuts (broken) and half a pound of logwood, together with the bonnets, and allow the whole again to boil, for one hour. Then take them out of the hot liquor, and hang them to dry as before, when they will be of dusky brown-black color. Chip bonnetts as a rule do not require so long as straw, because the chip takes the dye easier. The final process is to size or stiffen the bonnets, and put them into shape. This operation requires two ounces of best glue, put into two quarts of cold water overnight, and next day completely dissolved by boiling. When the glue is melted, strain the liquor (then called size) into an earthen vessel. Into this put the bonnets one at a time, till thoroughly soaked. When the bonnets are taken out of the liquor all superfluous size must be sponged off. They are then brought into shape as they get gradually dry, or they may be dried on a block. After this sizing process the color of the dye is improved, and becomes black as jet.

To Clean and Re-dip Black Feathers.—Feathers that have become rusty in color may be thus restored: First, well wash the feathers in soap and water, using the best mottled soap, and the water scalding hot for the purpose; then thoroughly rinse them in clean water and dry them. Next, take half an ounce of logwood, and boil in a quart of water. When scalding hot, put in the feathers, and there let them remain till the liquor is cold, after which rinse them in cold clean water, and put them to dry. Finally, rub or brush over the feathers the smallest portion of oil, which simple operation brings out the glistening jet appearance in a remarkable manner. If you draw a long strip of paper between the thumb and a blunt pen-knife blade, the paper will curl up. Feathers may be treated in the same way, using only such tender care as may be expected to be required in "touching a feather."—*Scientific American.*

Growing Potatoes under Straw.

Having seen, in the Agricultural journals, more than twenty years ago, reports of extraordinary success in raising potatoes by covering them with straw, I was induced to try a small experiment, which I will relate for the benefit of some of your readers.

A plat in my garden, about fifty feet square, of well manured clayey loam, was nicely spaded up and made fine and smooth. It was then marked out in shallow drills, two feet and a half apart, and potatoes (of the pink-eye variety) planted whole, two feet apart in the drills, and barely covered with earth. The whole patch was then covered with light, dry wheat straw—which

had been very much broken by its passage through a thrashing machine—and the same spread lightly and evenly with a pitchfork, to the depth of about two feet. Several showers occurred soon after the potatoes were planted, which settled the straw very considerably, and in due time the vines came up through the straw, and soon covered the entire surface with the rankest vegetation.

Nothing more was done to the patch till the vines were killed by frost in autumn. Not a weed appeared among them. At the usual time of digging potatoes the dead vines were all pulled, and removed; then, with a potato fork, the layer of straw—which was pretty well rotted, and not more than four or five inches in thickness—was carefully removed. To my great surprise, there lay the potatoes on the surface, *literally covering the ground*, and almost as clean as if they had been washed. They were picked up and measured, but the quantity I do not remember. This much, however, I well recollect, that I never raised so good a crop by any other mode of culture. They were of very uniform size, and of good quality. —S. MOSHER, Latonia Springs, Ky, March, 1858.

Undoubtedly the above method of growing potatoes is worthy of future trial—especially by those who live in warm latitudes. Protected by the straw from the scorching rays of the sun, the ground would naturally remain moist and cool—thus providing for the potato roots those conditions of soil best adapted to their growth.—*Ohio Valley Farmer.*

For the Southern Planter.

Management of Tobacco Crop.

RICHMOND, January, 1860.

To the Editor of the Southern Planter:

MR. EDITOR,—At the request of several planters of the county of Fauquier, who have recently commenced the cultivation of Tobacco, and who have but little experience in the curing and management of this staple, we hand you the following communication from one of our most successful planters of the Southside. As we deem your valuable paper the most appropriate medium for its circulation, we hope you will give it a place in your next number.

Resp'y, &c.,

BARKSDALE & BROS.

PRINCE EDWARD Co., Va.,
Spring Creek, Dec'r 13th, 1859.

GENTLEMEN:

Your favor of the 1st December is to hand. You desire me to give you a detailed account of my management of Tobacco, from the time it is cut until it is prised in hhds. for market, which I herewith give as follows:

All Tobacco should remain upon the hill until it is *thoroughly ripe*, which can be readily ascertained by its thickness and yellow, grayish, and brittle appearance. Cut when the sun shines dimly, if you can; but whether the sun shines dimly or not, (if proper care is observed), Tobacco will *fall* and *wilt* sufficiently to handle, in warm weather, without breaking. From eight to ten plants upon a stick will be sufficient; eight plants, if the Tobacco is large, ten if medium size. Cut one or two *houses-full* if you can, less than a house-full cannot be cured to advantage; and two houses can be cured more advantageously than one, as you will perceive during the process. Scaffold it about two days, to give it an elastic, tough quality, so much desired by all good judges of the article; after which time, commence housing, beginning at the top and placing the sticks from six to eight inches apart, coming down *tier* after *tier*, until you reach the first firing tier at bottom. In the same manner commence and fill another house.

You are then ready for the *curing process*. Half-seasoned wood, *oak* or *pine*, is preferred. Build small fires all over the ground-floor of the house, four feet apart; let the *fires be small*, and, regardless of any thermometer, let the Tobacco be the guide in ascertaining the degree of heat to be kept up under it. Do not *coddle*, *burn*, or *color* it, but let the heat be sufficient to *sap* and *dry* it out in two or two and a half days. You may then raise the heat, by degrees, until the leaf is cured, which will take from two to three days more. *Fire only in the day time;* put out all the fires at night, and begin again early in the morning.

After the leaf is cured and in supple order, the best plan is to *re-hang*, putting the Tobacco of two sticks upon one, and replacing as before; giving as much room between the sticks as at first. You may have the Tobacco as close upon the sticks as you can get it, but it is very essential to have *space* between the sticks. You need not re-

gard *swollen stems*, or a few *green* ones; it will all cure up finely, if you follow out the plan laid down. You may give it a little fire only in warm, damp weather.

A great many planters object to re-hanging, on account of the time it takes; but my experience convinces me that, in the end, it saves a great deal of *time*. It saves sticks, the time of one hand, and house-room; for you can thus put two houses of Tobacco into one, and then, by being *jammed* one way, it will retain its original color.

About the middle of November I begin to take down my Tobacco for stripping, which should be done in very supple order.

In assorting I make five grades: *long bright*, *short bright*, *long dark*, *short dark*, and *lugs*. Tie four leaves to the bundle of the *long*, six of the *short*, and eight of *lugs*, using the shortest and inferior part of the crop to tie with, but always tie with a whole leaf. Straighten and pack down at night what is stripped during the day, with two bundles together, and weight only with tobacco sticks. After the Tobacco has remained in bulk from two to three weeks, rebulk in supple order, straightening *only one bundle* at a time, and keeping the hands of those engaged in straightening well greased with hog's lard, or fresh grease of any kind. After your bulk is of sufficient height, cover with tobacco sticks or plank, and *weight heavily* with rock or anything else convenient. Let it remain thus under weight until the last of March, when it should again be hung up, about twenty-five bundles to the stick, and four inches space between the sticks, to order for prizing. It will dry out, leaf and stem, in a few days, if the weather is favorable; if not, it should be dried out by *fire*. The first season that comes after this, take down in dry order, when the stem will crack from end to end, which is *prizing order*.

When it is taken down in prizing order, coop it, tail and tail, as high as you can reach, and then bulk again, straightening four bundles at a time. Weight your bulks as before, and in two or three days you may commence prizing, which should be done in the month of April, if it suits, but should be done, at any rate, by the 20th of June, and delivered in market.

You also request me to give my mode of cultivation. I could easily do this, if every year were precisely the same, and every season alike; but the years and seasons differ so widely, it is unsafe to rely upon any particular plan for the cultivation of a Tobacco crop. Suffice it to say, that you should plant as early after the 20th of May as you can, and be sure to have a living plant in every hill by the 20th of June. Cultivate well with *plows* and *hoes*, and never let the grass defeat you. Stop plowing and hoeing about the middle of August, and keep down the suckers, and keep off the horn-worms.

Yours in friendship,

D. F. WOMACK.

To Messrs. BARKSDALE & BROS., Commerchants, Shockoe Slip, Richmond, Va.

[The foregoing plan, and mode of curing Tobacco, was submitted by Capt. D. F. Womack to two distinguished and successful planters of his neighborhood, for their opinion, with the request that they would make any suggestion they might deem important, which we append to this.]

We, the undersigned, have read the foregoing plan and mode of curing Tobacco, from the time of cutting until it is ready for prizing, and concur in the directions given, and think it as good as any, if not the best plan practised in the management of the article.

Signed, SAMUEL F. HUNT,
WM. A. WOMACK.

From the British Farmer's Magazine.

The Lois Weedon System of Husbandry. Its Importance to the Farmer.

A few numbers back a review appeared in this journal of a work on the Tullian system of husbandry, as revived and illustrated in the practice of the Rev. Samuel Smith, of Lois Weeden, Northamptonshire, despite the ridicule and abuse of those who, like the late Sir William Curtis, are "quite satisfied with things as they are." This gentleman has now given the system a trial of twelve consecutive years, during which, without a particle of manure, he has grown wheat, year after year, upon half the land, reaping an average produce of thirty-five bushels per acre. The method of Mr. Smith is well known to our readers; the land having been kept open by the spade to a subsoil depth, three rows of wheat are planted or drilled, at one foot distance between the rows, of course occupying three feet. The next three feet of land being left vacant, three more rows are planted on

the other side of the void spaces, and so on throughout the whole field. One great point in this husbandry is, keeping the intervening fallows well tilled with the spade, and clear of weeds, during the growth of the crops upon the planted parts, and using the horse-hoe freely between the rows of growing corn. As soon as this is reaped, the vacant spaces are at once planted; and so on, year after year, without any change of crops, application of manure, or cessation in the course.

It is not a little remarkable, that after all the efforts that have been made, with the aid of modern science, capital and skill, to raise the fertility of the earth to the highest pitch it is capable of—after all the money expended in the manufacture and purchase of manure, in order to draw from the soil the greatest possible amount of produce—after the publication of innumerable books to prove that if you put nothing into the land you cannot expect to obtain anything out of it, and that for every cereal crop of grain grown, it is necessary to compensate the soil for the loss of elementary matters by a fresh supply in the form of manure;—it is, we say, remarkable that we are called upon, in the very zenith of our agricultural glory, to retrace our steps, and revert to the practice of a speculator, who, a century and a half ago, started a principle upon which, if true, the restoration of the fertility of the soil is based. Namely, that the atmosphere alone contains an abundant and everlasting supply of all the elements of fertility necessary for the growth and sustenance of plants.

This perfect competency of the atmosphere to furnish a supply of food for plants must be accompanied with an attractive power in the soil itself to absorb and modify these substances, and thus reduce them to a form in which their assimilation by the plants is promoted. On no other principle can a result so contrary to all the hitherto-received opinions and practice of agriculturists be accounted for. Every modern writer on agriculture, whether scientific or purely practical, has maintained the necessity of a constant application of manure, in order to compensate the soil for the exhaustion of a cereal crop. It is for this purpose that herds of cattle and flocks of sheep are kept on our farms, it being almost universally asserted by farmers that they only repay the expense of their maintenance by the manure they produce, by which the produce of cereal crops is increased. Without absolutely endorsing this assertion, we may safely assume, from all experience, that, on the present system of farming, it would be impossible to grow corn profitably without manure; and that a constant succession of cereal crops, without it, would exhaust the most fertile soil in the world. We must therefore conclude that the secret of the success of the Lois Weedon system, which is a copy of Tull's, lies in the constant stirring of the soil under fallow, in order to promote the absorption of the elements of fertility. And moreover, the proportion of that success depends upon the degree and the depth to which the soil is stirred and comminuted. A remarkable corroboration of this opinion has occurred during the present season on the land laid down with Halkett's guideway-cultivator, at Wandsworth. This land had been deeply subsoiled, and communited with the Norwegian harrow and planted with potatoes, without manure. On each side of it the land was tilled in the common way, and also planted with potatoes. The latter produced one bushel per rod; but the former yielded 2½ bushels per rod, being an excess over the other of 240 bushels per acre. This amounts to 7½ tons, which, at £5 per ton, is £37 10s. A similar result is obtained by Mr. Smith's spade-husbandry over that of the plough, as practised by seven other experimenters on the Tullian system. Their average produce was 24 bushels 3 pecks per acre, whilst Mr. Smith's was 35 bushels. Their highest produce, also, was 27½ bushels per acre, whilst Mr. Smith's was forty bushels. It is further worthy of observation that this system is so far from impoverishing the soil, that it seems to improve it; and that the produce, after twelve consecutive years' trial, has increased rather than diminished, that of 1858 being forty bushels per acre. This is a very remarkable feature in the system, as it demonstrates the fact that tillage alone, by stimulating the soil and promoting the absorption of elementary matters from the atmosphere, is sufficient to sustain its fertility.

It is evident that if the Lois Weedon or Tullian system is what it has been represented to be—and there is not the slightest reason to suppose that any deception or misrepresentation has been practised—the expense of farming upon it must be much less,

and the profit much greater, than on the common system. Accordingly we find that whilst the profit upon a four-course rotation, according to Bayldon, ("On Rents and Tillages,") does not exceed £1 5s. 3d. per acre per annum, that of the Tullian system is £4 2s. per acre per annum; being in excess of the other of £2 16s. 9d., or considerable more than double. This, too, is under plough culture; but Mr Smith's spade culture is still more profitable; for whilst the average produce is 35 bushels per acre, which at 7s. per bushel (Mr. Smith's estimate) is £12 5s., his expenses amount to only £6 0s. 4½d., leaving a balance of £6 4s. 7½d. per acre, without reckoning the straw, which, as no manure is required, may be sold to increase still more the profit.

The question then remains to be solved—can this system, which is so profitable on a small scale, be made applicable on a large one with an equally favourable result? We see no reason whatever to doubt the facts that are stated in the work we have referred to, derived as they are from sources beyond the suspicion of deception, and corroborating each other. It is a pity that the subject is not taken up seriously by the Royal Agricultural Society or the Central Farmers' Club, and experiments on a large scale instituted, in order to bring the system at once to the test as the most useful and profitable to the farmer, and consequently to the public.

There is one other question involved in these experiments, we think, worthy of notice—namely, whether manures do not act more *indirectly* as stimulants and absorbents of the alimentary matters in the atmosphere than *directly* as fertilizers *per se?* We know the affinity of many chemical substances, which causes them to unite when placed in juxtaposition. Thus common salt, if placed on a reeking dung-hill, or on any substance emitting ammoniacal matters, will be found to effervesce strongly. This is caused by the absorption of the ammonia; and it will continue until the salt is supersaturated, when it ceases, and the union thus formed is nothing less than the sal-ammoniac of the chemist. This is a subject worthy the attention of the scientific farmer, who will know how to turn it to his advantage, by applying the principle to his every-day practice.

From the British Farmer's Magazine.

The Implement Trade at the Cape of Good Hope.

In the middle of last month [November] the great Agricultural Society of the Cape of Good Hope held its annual exhibition at Cape Town. As with us, it was a show of both stock and implements, imported cattle and sheep valued at upwards of a thousand pounds being entered. Considering the prices at which animals leave England, this is not perhaps saying much. The display of machinery was more imposing, and estimated at least four times the sum of that of the beasts. That is to say, there were four thousand pounds' worth of implements on the ground for the Cape farmers to pick and choose from. Amongst these there were no less than *forty-two* varieties of ploughs; and we can picture the colonists going through the old controversy of Howard, Ransome, or Hornsby; or Hornsby, Ransome and Howard—Page, Ball, or Busby; Busby, Ball and Page. We might even go so far as to imagine that the several representatives of these houses could have been spared for so agreeable an autumn trip, and that Mr. Sutton, Mr. Barrett and Mr. Cole were on the scene, politely distributing their catalogues, and descanting on the premiums they had taken and the wonders they had done. Alas! however, it is too well known that some of the finest flights of our poets, and some of the grandest efforts of our artists, have been to depict their heroes in actions that they really never took a part in. And so would it be with our pæan over what Grantham, Ipswich or Bedford did at the Cape Town ploughing match—for there was not one of them there. Of these forty-two varieties of ploughs for the English colonists to purchase, every one of them was of American manufacture. In the whole four thousand pounds' worth of machinery there was scarcely anything whatever of English make. There were English horses of course, for the breeders out there are beginning to take to them very warmly at last, and, as we have already heard, there were English cattle and English sheep. But with all our knowledge of business, our different plans of pushing a trade, and more than this, with all our fierce opposition one to the other here at home, there was not an English plough on the ground! We begin to fear we shall yet

ve to qualify what we set out with, about ere being no people so strongly imbued th the spirit of commercial enterprise, d to put America before them. It is al- ost incomprehensible how they can have much anticipated us in this direction; for it was worth the while of the United ates to send forty-two sorts of ploughs, it ght certainly have been worth the atten- n of the United Kingdom to send a few. e can, indeed, very readily echo the com- entary of the Judges on making their ards, and "the surprise they expressed at eing English manufactures so badly rep- sented."

Surely, this is a matter worth looking to. ith some of our best blood to go on, the mericans already declare that they shall on "grow" better Shorthorns than we can. heir horses, by the same system, are often ual to our own, as it is. The first fa- urite for the Derby at this very time is a lt brought over by Mr. Ten Broeck; and Yankee pugilist is coming to fight our man r the Championship. In some descrip- ons of machinery even, we only follow eir lead, and the best of our reapers and owers are either invented or improved up- by Americans. But they are too 'cute a eople to slight any hint or wrinkle they ight take from us. At the Agricultural air held at New York, just about the same me as this meeting at the Cape, the en- ies for implements were kept open to the ery day previous to the show, with the es- ecial view of allowing strangers every op- ortunity for attending. We gave the time nd place of this gathering, one generally nown as that of the American Institute, in ur List of Meetings to come. We have ot yet heard how it was responded to; but due course we shall have the report from ur own correspondent in those parts. There , at any rate, scarcely a celebration of the ind on this side of the water but a Trans- lantic friend has some new discovery to ow us; or, armed with a pencil and a let- r of introduction, something "to remem- er to remember" when he gets home gain.

It must not either be supposed that all ur leading manufacturers are as much above, r simply as indifferent to the Cape market s our implement makers appear to be. It only during this very week that we see hat the "Messrs. Hawthorne, the celebrated ngine-builders of Newcastle-on-Tyne, have just completed the first of a batch of eight locomotive engines which they have been commissioned to make for the railway at the Cape of Good Hope, the first sod of which was recently cut by Sir. G. Grey. This engine has been making trial-trips on the Newcastle and Carlisle railway line, and it is built on a new principle," and so on. Might it not be worth the while of other celebrated engine-builders to ascertain what is wanted at the Cape? An agricultural meeting at this date rarely depends upon ploughs only, and there are all kinds of inventions which the Cape farmers might patronize if they only had the chance of doing so. We have been rather inclined to pride ourselves for some time past on having as a whole by far the best collection of agricultural machinery of any people in the world. We hold somewhat to this opinion still, and are so unwilling to see ourselves "cut out" in any quarter, but more especially amongst our own kith and kin. Depend upon it, if it will pay American houses to send forty specimens of ploughs to a Cape show, it might answer the purpose of an English firm to try a bout with them.

Poisoning Land.

BY PROFESSOR E. PUGH, PH. D., F. C. S.

Notwithstanding all that has been said and written during the last few years, upon the subject of agriculture, the ideas of the great mass of the people, upon many points of the highest importance to agriculturists, are very much confused. Upon no questions is this more marked than upon those suggested by the words, nutriment, stimulant and poison, in reference to the growth of plants.

Many farmers think that certain substances stimulate the land at first, and overtax its powers, and ultimately *poison* it. Such ideas originate in conceptions obtained from false analogies which men are too prone to draw between animal and vegetable life. The earlier vegetable Physiologists were, for a long time, deceived as to the true character of vegetable growth in the same manner; but at present, scientific men are aware that no aid is obtained in studying vegetable physiology by the apparent analogies afforded by animal physiology. A difference of opinion sometimes exists, as to what is the correct definition of a *poison* in regard to animal life. And a

more difficult question might arise on the same subject with regard to vegetable life.

But waiving these difficulties we may get at a practical definition of what nutriment, stimulant and poison, applied to vegetable food may mean, which will throw some light upon the subject we are considering.

First. NUTRIMENT.

Under this may be included all those elements, and combinations of elements, that are essential to healthy and vigorous vegetable growth, whether obtained from the soil or the air, which enters into the plant to form part of its substance.

These embrace about 13 different elements, all of which enter the plant, more or less, in combination with each other; eight of them *must come from the soil*, and the remainder *may* come from the soil, or from the air, or from both. Independent of vegetable growth, there is all the time a more or less active interchange of these latter elements between the soil and the air, so that it is difficult to decide how far they are obtained by the plant directly from the air through the leaves, or indirectly from it at the roots, through the soil; consequently while *all* scientific men admit that these eight substances *must always be present in the soil*, to ensure its fertility, there has been a difference of opinion as to how far it is necessary to add some of the remaining five to the soil to ensure conditions "amply sufficient for the purposes of agriculture." *If all of these substances are not accessible to the plant in the soil, or the air, it cannot grow.* At times some of them fail in the requisite quantity, and it becomes the duty of the farmer to find which they are, and to apply them in manures to the soil.

Secondly. POISON.

All substances may be considered poisonous which are not included above (that is which do not enter the plant to form a part of the increase during healthy growth,) and which when placed in contact with growing vegetable matter, are absorbed by it, and prove injurious or destructive, to vegetable growth. This may include many combinations of elements, which combined in other proportions or in different circumstances, might be nutritious; acids or alkalies might, when *alone*, act as poisons, when in the *combined* state they would be nutritious. The products of decomposition of vegetable matters are, no doubt, in some instances, poisonous to vegetable growth; the ultimate cause of the disease to which some plants, as the potato or the clover, the vine, &c., in America and Europe are liable, may be due to poisonous products formed in the soil.

The theory of the rotation of crops, which at first was explained, simply by supposing different plants absorbed different substances from the soil, and while those of one plant were being removed by it, those of another were accumulating, has become more complicated of late, by certain considerations which seem to indicate, that substances poisonous to one plant and not to another, may disappear from the soil, during the growth of the latter, and hence leave the land in a state adapted to the wants of the Farmer.

All substances which are nutritious to plants in ordinary circumstances, will prove destructive to them if presented in too large quantity, and hence it is not always easy to decide what is a poison in the sense of the definition just given.

Thirdly. STIMULANTS.

None of the substances which are usually considered stimulants, are such in the sense that this is applied to animal life. Nothing is more absurd and ludicrous than the common notion that certain substances, as guano, or plaster of paris, stimulate the land in any sense of the word.

It is not easy to apply this term to substances affecting vegetable nutrition, yet if we must use it, substances like lime, which do not afford nutriment directly to plants, in the same degree that they promote their growth, could more appropriately be called stimulants, than those just noticed. Some chemical substances which promote the sprouting and early growth of plants without affording them any nutriment, might also be called *stimulants*, and others which retard this action might be called *sedatives;* but as these terms convey *improper meanings*, and imply that we know a great deal more about vegetable physiology than we do, it is best to discard them altogether.

PRACTICAL CONSIDERATIONS.

From the above we might infer,

1st. That soil to be productive must contain every one of about eight different substances, and four to five other substances must be present in the soil or the air.

2nd. That if any one of these fails in the soil, barrenness will result, no matter how much of all the others may be present.

hough a sufficient number of all the other ubstances were present to produce crops for ie hundred years, *did it not fail, the ab-nce of this one would render the soil barren.*

3rd. If the soil contain a limited quanti- of any one of these substances, and no ore be added during successive years, in hich crops are grown and removed from ie land, this substance must ultimately all e removed, and barrenness must result.

4th. If a soil be barren owing to any of ie above causes, the addition to it of the iling element will restore its fertility again, id in consequence of this fertility new ops may be raised, and hence new quan-ties of all the other seven substances re-oved from the soil. If this process be epeated, and by successive additions of the iling element, successive crops be raised, second and a third element, will all be emoved, and these, too, must be replaced the same manner as the first, in order to aintain fertility. *The soil will be poorer fter the addition of these failing elements, ecause with them we are enabled to raise ops which remove from the land, not only e element added, but about seven other ele-ents that were in it before.*

4th. The substances usually called stimu-nts are simply such as afford to the soil, ertain elements of *nutrition*, which are not resent in an available form for the de-ands of vigorous growth. They do not roduce the crop, but, united with other ubstances in the soil and air, they do pro-uce it. They form *a part of a whole*, ithout which the plant cannot grow, just s the axle-tree of a wagon forms a part of ie wagon, without which it could not move. Vithout the axle tree the wagon could not e worn out, yet it would be a strange kind f logic which would infer, that because the ntire wagon was worn out *after* the addi-on of the axle tree, that therefore the xle tree had acted as a *stimulant* upon ie wagon, and worn it out; or that ecause the same result could not be ob-ined with the old wagon as with the new, herefore, the axle-tree had *poisoned* the agon. Absurd as this kind of logic would eem, the farmer may rest assured that it is uite as rational as that which supposes cer-in substances to stimulate or poison the nd. And the farmer might, quite as ra-onally, refuse to replace the broken axle of is wagon, because after doing so the wagon ould be worn out, as to refuse to supply the failing element in his land because the crops that would follow would exhaust the land of the substances that it already pos-sesses.

These considerations may be illustrated by *an example.*

Suppose a soil to contain enough of an element A to raise wheat for four years; enough of an element B to raise wheat for six years; enough of C for eight years; enough of D for ten years; and enough of all the other substances S required for twenty years. If such a soil had been grown with wheat since 1856, we would have in

1860, all the A exhausted,
sufficient B for two years,
" C for four years,
" D for six years,
" S for sixteen years.

This soil is barren now for want of A; let us add sufficient of A to last two years, and then we get two more crops, and we will have in

1862, all the A again exhausted,
" B exhausted,
sufficient C for two years,
" D for four years,
" S for fourteen years.

The soil is now barren for want of A and B; let us add enough of each for two years, and then we will have in

1864, all the A again exhausted,
" B " "
" C " "
sufficient D for two years,
" S for twelve years.

Now the soil is barren for want of three elements, A, B, and C. If these were add-ed, we would have in

1866, all the A again exhausted,
" B " "
" C " "
" D " "
sufficient S for ten years.

Fertility can now only be restored by the addition of four elements, A, B, C, and D.

Now, a farmer commencing to work such a soil in 1856, might have supposed that it was inexhaustible, but in 1860, it becomes barren.

The addition of the manure A to it, then, restored its fertility, he now might get the idea that A would do to restore the fertility

of *all worn out land;* but after two years more, A ceases to be of any perceptible use; he might then conclude that A had *poisoned the land*, but on the addition of B, he restores fertility. He would, doubtless, now recommend B to all his neighbors; but soon B becomes inoperative, and must be set down as a poison. We need not here dwell upon the fallacy of such conclusions, yet they are entertained by farmers all over the country.

I have avoided the use of the names of the elements of fertility to soils, in order to meet the tastes of those who do not like to be troubled with scientific terms. On some future occasion we may discuss the character of soils in relaiion to these substances, and to manures, the value of which must be dependent upon how much of them it contains.

From the Farmer and Gardener.

Physical Condition of the Soil.

BY WILLIAM BRIGHT, LOGAN NURSERY, PHILADELPHIA.

Too little attention is given by farmers, gardeners, and amateur cultivators of all classes, to the physical condition of the soil. Everybody is hunting after manures and special fertilizers, but few think enough of the great advantage to be derived from a proper plowing and cultivation of the soil. It has been recently proved by careful experiments made in England, that deep plowing, and thorough cultivation, is fully equal to free manuring, even in poor or exhausted soils. One class of chemists tell us that there is mineral matter enough in all soils to meet the wants of crops for a hundred years, if this mineral matter could be rendered soluble and fit for the food of plants. Another class of chemists tell us that if you have mineral matter in proportion in the soil, plants can assimilate carbonic acid and ammonia enough from the atmosphere and rain to stimulate them to the highest degree of perfection. Now we know, as a practical fact, that when soil is constantly stirred, and the particles of matter are frequently thrown into new relations to each other, chemical action takes place more rapidly than when the particles remain for a long time in one position; and hence, much soluble mineral matter is produced by this chemical action or process of decomposition. Thus a barren soil may be rendered fertile, simply by deep and thorough plowing and cultivation with the roller, harrow and other implements. It may require a little time after such plowing and cultivation, for the chemical processes to become perfected, but a good result must follow such practice.

But soil must not alone be plowed, rolled and harrowed, to disturb the relation of particles; it must also be shaded from the direct rays of the sun, to produce the best effects. To this end it will be highly useful in all efforts to improve a poor soil, instead of leaving it fallen and uncovered, either to mulch it all over during summer with long litter, or to sow it with some plant which shall not only shade it, but promote the decomposition going on in the field by the influence of its roots, and furnish a mass of green vegetable matter, for after mulching or turning under. Decomposition of soil can only go on when it is moist, warm, and shaded. Light, dryness, and cold, all tend to prevent decomposition. Clover is, beyond all question, the best green crop that can be grown for improving exhausted soils. But sometimes soil is so poor that clover will not grow successfully, and in such cases resort must be had to corn sowed broad-cast, or the southern field pea, or the little soup pea of Jersey and Delaware, which will grow, without manure, on blowy sand, and produce several tons of green matter per acre.

Soil in its most perfect state should be wrought into a condition of the most minute divisions of particles; it should be light and porous, and of a friable character, free from lumps and sodden masses; dry, yet moist; sweet, but not strongly alkaline; and so supplied with sand, or other opening substance, that it will not bake upon the surface.

And here we come to the main point of this article, which is to warn all young cultivators of the soil not to work it, or to tramp it, or run horses or carts over it when wet or frosty but not frozen. More harm is done in this country, by the careless working of the soil when wet and sticky than can be repaired by the best cultivation and the most expensive manuring. To the young farmer and gardener we say *strongly* and *earnestly*, never work your soil or allow your men or carts to run over it when it is wet and mucky. No matter how backward may be the season, *wait, wait* till the soil is

in a condition to be worked before you attempt to plow it, or put in your seed. The whole advantage of plowing is destroyed by "bunging up" the soil in wet weather. You may break up the old lumps of soil, but for every lump so broken you create a dozen balls of earth as hard as a mass of mortar, which years of after culture will scarcely reduce to a state of fine divisions suitable for the resting place of plants. Work your soil freely and constantly in fine, dry weather, when not too windy, and you will be richly repaid for improving the physical, and mechanical condition of your land; but beware how you touch it, or tread upon it even, when wet and pasty. We know of no error so fatal to good farming or gardening as this of working wet and half-frosted soil.

Advantages of Pulverizing the Soil.

The effects of pulverization or stirring the soil are numerous:

1. It gives free scope to the roots of vegetables; and they become more fibrous in a loose than in a hard soil, by which the mouths or pores become more numerous, and such food as is in the soil has a better chance of being sought after and taken up by them.

2. It admits the atmospheric air to the spongioles of the roots—without which no plant can make a healthy growth.

3. It increases the capillary attraction or sponge-like property of soils, by which their humidity is rendered more uniform; and in a hot season it increases the deposit of dew, and admits it to the roots.

4. It increases the temperature of the soil in the spring, by admitting the warm air and tepid rain.

5. It increases the supply of organic food. The atmosphere contains carbonic acid, ammonia, and nitric acid,—all most powerful fertilizers and solvents. A loose soil attracts and condenses them. Rain and dew, also, contain them. And when these fertilizing gases are carried into the soil by rain water, they are absorbed and retained by the soil, for the use of plants. On the other hand, if the soil is hard, the water runs off the surface, and instead of leaving these gasses in the soil, carries off some of the best portions of the soil with it. Thus, what might be a benefit becomes an injury.

6. By means of pulverization, a portion of the atmospheric air is buried in the soil, and it is supposed that ammonia and nitric acid are formed by the mutual decomposition of this air and the moisture of the soil—heat also being evolved by the changes.

7. Pulverization of the surface of soils serve to retain the moisture in the sub-soil, and to prevent it from being penetrated by heat from a warmer, as well as from radiating its heat to a colder atmosphere than itself. These effects are produced by the porosity of the pulverized stratum, which acts as a mulch, especially on heavy soils.

8. Pulverization, also, as the combined effect of several of the preceding causes, accelerates the decomposition of the organic matter in the soil, and the disintegration of the mineral matter; and thus prepares the inert matter of the soil for assimilation by the plants.—*Genesee Farmer.*

Advantages of Moistened Food over that which is Dry.

Besides the benefit secured by causing the ground grain to adhere to cut hay or straw when wet, it has been ascertained by Boussingault in some well conducted experiments, that soaked fodder forms a more suitable food than that which is dry. He found that heifers fed with soaked hay gained in weight over those fed during the same time with dry hay. By reversing the order of feeding, the results were the same. The experiments referred to appear to have been simply to test the advantages of moistened food over that which is dry. Notwithstanding the moistening of hay will render it more readily digestible, yet the advantages gained would hardly warrant the labor. But in ruminating animals a great advantage results from feeding the grain in combination with the hay or straw, and this can only be done by grinding the former, and cutting and wetting the latter. But to do this economically all the necessary appliances must be at hand for grinding, cutting, wetting, &c. With these, arranged as they may be, a large number of cattle may be fed with no great increase of labor. This system of feeding in stalls affords the advantage of saving and making a greater quantity of manure than by any other, which ought to be, if it is not, a matter of the first importance to every farmer.

Valley Farmer.

For the Southern Planter.

Advice to Young Farmers.

In a former article we told our young farmer friends of the importance of steady government, both of one's self, and of his household. We told him of our preference in regard to the style of building dwelling houses, negro quarters, and the importance of cleanliness about that department of his premises. We told him how we would place our stables, and of the style of construction,—and now we will go on to speak very briefly of the cow houses, the corn houses, wheat barns, wagon sheds, wagons, carts, &c., tobacco houses, the preparation of plant beds, the cultivation and management of the tobacco crop, the cultivation and management of the corn crop—together with the manner of feeding it and other grains. We will talk about the culture of wheat, not theoretically, chemically, but as we have seen it cultivated, and cultivated it ourselves; of making and applying manure,—then of sheep, hogs, and other stock. But lest we tire them with the enumeration, we will jump right into the midst of things, and continue our sage remarks—sage, we say, because all old men think their observations and practices are *sage*.

COW SHELTERS.

We prefer these to be open sheds, closed up on the north and west side. Like the stables, these also should be built on posts; eight feet apart; seven to eight feet pitch in front; let into the ground two and a half or three feet; twelve feet wide, and as low behind as will cause the water to run off readily. These shelters should be divided into at least three compartments, for the milch cows, for the oxen, and for the young cattle. They should also be built adjoining, or as near to the stable and the fresh water as possible, for the double reason, that this kind of stock are especially liable to suffer for water, and because the master can take all these things into his eye at a glance—without which eye daily, 'tis vain for you "to sit up late, or eat the bread of carefulness." Suffice it—'tis more than corn or foddering to the poor beasts!

CORN HOUSES.

We would build these at least twenty by twenty feet, in order that full room might be had in front for shelling, &c.; this outer apartment, however, might be covered overhead with plank, so that the corn thrown in through an upper door may fill overhead in this space. We prefer these houses framed in the usual manner, with strong studding six or eight feet apart, and stripped perpendicularly on the inside, with strips four inches wide and one thick. Ten or twelve feet pitch will admit of a wagon shelter on each side of it sufficient for two or more of these important implements in good husbandry. Be sure, however, to have these sheds built so as that it is easier to leave the wagons in them of a night than 'tis to leave them out, or you will find the shelters comparatively useless, as negroes don't understand how exposure can hurt these things.

But we have something more to say about wagons, carts, &c. Will our young friends be warned by us, who have had thirty years experience, against buying old wagons, old carts, or anything old that runs on wheels? Aye, and we will heartily, most heartily, extend the warning against anything that walks on legs, either two or four. No, we know they will not, nevertheless we will sound the warning! When (we were younger then than we are now) Kentucky and Tennessee were considered the "far west," we knew a very observant old man, who had made the trip thither and back some thirty odd times in the removal of families in his wagons, who remarked to us while talk ng on the subject, "I make it a rule to get me a wagon at ———; a famous wagon factory, and never to run it after the screws become loose in the taps; I sell it immediately,—calculating, from my experience, that when they come to the patch, they are the most costly property a man can own." This advice was from an old wagoner who had done nothing else for thirty years; and with our thirty years experience, we testify to the truth of the declaration. Some great writer, (Carlyle, we think,) says, "Experience is an excellent teacher, but he does charge such a high price!" We'll suppose, however, that our young friends will be warned by our old wagoner friend, Carlyle, and OURSELF,—and that because of their apparent cheapness he has not been taken in, but has had good, new vehicles, of all sorts, made by faithful workmen,—he will find these sheds worth to him fifteen times the cost of them in the twenty years that a

good wagon will last, if he will only pitch the wheels once in a summer or two, and keep the running-gear all tight.

WHEAT BARNS.

Every farm should have on it one or more of these convenient receptacles for grain. We prefer them small, and in number according to the size of the plantation. We would build them with the boarding nailed perpendicularly, because it takes less framing, and because the weather-boarding lasts longer, especially when rough-dressed and painted.

TOBACCO BARNS.

We prefer these to be built according to the convenience of the material—either of logs cut for the purpose from the woods, or with posts set firmly into the ground, and weather-boarded as in the manner prescribed for our other buildings,—leaving off the stripping, however, but having the plank straight-edged and pressed closely together in order to allow for shrinking. This latter is much the cheaper plan of building, if the lumber can be obtained near and cheaply. We think the size generally preferred is twenty by twenty feet in the clear, with four firing tier, and what is called the ground tier. This with a steep roof will house with ordinarily large tobacco from 1000 to 1200 sticks, with from eight to twelve plants on a stick.

PREPARATION OF PLANT BEDS.

It is with diffidence we speak upon this subject, for, while we have tried all the various plans suggested by others, as well as those suggested by our own observation, we must confess that we have found it an unce tain business. Our failures have generally, however, been owing to our not having burned land enough. We can say this, though, without the fear of successful contradiction, that no man can make a crop of tobacco unless he has more plants than he wants; hence I would say that if your land is light and rich, and moist, and thoroughly burnt, and carefully covered, that one hundred yards to every 10,000 hills would be a safe dependence; but if the land is of a contrary character, no matter how well burned or covered it may, (and I have found the covering to be of the greatest importance,) the 10,000 hills will require at least one half more plant land. We have found no substitute for hard-burning and very heavy covering, in the preparation of plant land, whilst others have found this substitute in guano. The quantity of wood and trash necessarily consumed in yearly preparation of plant land is immense; but if the young planter, in opposition to the advice of our most esteemed friend, Gen. Cocke, will make the "noxious weed," let him go at it say we, as he should at all things else of the kind he may undertake, with the determined resolution to succeed if foresight and industry will take him through. Having, then, as soon after Christmas as possible, or during the month of December, prepared his beds on any other but a *red stiff soil*, and sowed them, let him be sure to keep them well tramped, well covered, and the leaves off; and have them in the woods if it can be so, because the fly eat them less. The land on which he plants it should, if possible, be gray, or at any rate *not red and stiff;* and before setting out the plants, which ought to be done certainly by the 10th or 20th June, the land should be thoroughly pulverized; if new land, every root got out, and if old land, every clod reduced, until there can be no probability of the root of the young plant coming in contact with obstacles of this kind. If it does, you not only lose the plant which is of vast import, but the season also; and this makes it important, too, that the plants be stuck with great particularity.

Having had the land gotten into good tilth with manure, or guano, or some aid of this kind, (for all lands almost, however rich, want somethiug of the kind to quicken the plant in the ripening process,) you will find that if it has been planted, and has grown as fast as a well prepared soil should make it grow, that it will have to be stirred with the hoe, if possible, but certainly with the plow just a few days before the harvest in Eastern Virginia commences. This must be done, or it will be all overrun with weeds and grass before the wheat is secured; and just at this stage of the crop, let me assure our young friends, it is especially needful that they remember that one stroke of the hoe or one hour's labour is worth at least nine at another season. If he intends to be quick at any time during the year, just about this time he should be stirring. Neither overseer nor negroes will be able to comprehend the im-

portance of this rush; but let the master be caught once with a full crop of tobacco spreading the hill, at this season, unworked, without even ever so little stirring, and he will afterwards remember it, and follow our advice, if he has to do it by moonshine. A single furrow, or two at most, struck in the centre of the row, will, at this stage of the crop, greatly expedite the few chops which will be sufficient now for each hill. After harvest, as soon as possible, it should be worked thoroughly both with plow and hoe, and if large enough to top, it should be primed, or have the bottom leaves taken off about from five to six inches from the ground, and then topped according to the quality of the land or the fancy of the planter; the high topping having a tendency to make it fine, and the low topping making it coarse. Old planters say that a plant topped to eight leaves will make more in weight than when topped to any other number. If this second working has been efficiently done, unless under adverse circumstances, it will rarely be found necessary to do more to the crop than chop it over again. When planted, as the crop should have been, pretty much at the same time, (and in this is showed the necessity of an abundance of plants,) the land having all been prepared with equal care, the crop will come in about half and half,—that is, when the first half is ripe, the other half will just about allow you time to get that in and well cured down, when you may proceed to take in the remainder. Another advantage of making but two cuttings of a crop is, that it is cured with much more uniformity, both as regards colour and quality. We prefer to let it all stand, however, unless it fires, as long as the season will justify, being fully persuaded that we much oftener cut it, at last, green than ripe. From the hot sun of the season—latter part of August and first September—when the first cutting is made, the tobacco will burn frequently before it will fall enough to take up; great diligence should be used, therefore, to prevent this, as it destroys the plant entirely if thus suffered to be sun-burnt; better run the risk of breaking it than burn it. It may either be hung at this stage, and put on scaffolds in the field for a week or ten days, if the weather will permit, or taken immediately to the house as it is hung from the piles, and placed away there. If this latter plan is adopted, however, not more than a day or two at farthest should be suffered to elapse before little bark fires, a double handful in a place, should be kindled all over the floor, so as to create in the house about as much warmth as is produced by a warm sun of a summer's day. Under this process, in the course of a day or two, the tobacco will have become sufficiently yellow to begin to cure, when these little fires may be increased, carefully, however, as the tobacco cures until they may take large logs on them, or the heat may be so great that 'tis disagreeable to be in the house. In from four to five days from the time of commencing to cure, the operation will have been completed. When beginning to cure, the heat should be increased gradually, and the tails of the tobacco watched carefully, as to the lower tiers, for the slightest extreme of heat will coddle or turn them black. Before any of this process begins, we should have remarked, the house should have been made tight, by cramming mud into the interstices of the logs. If the planter cure by charcoal or by flues in the house, the same temperature will have to be observed during the whole process, as if he had used the common wood fire plan.

A very great advantage, which we omitted to mention in the proper place, of suffering the tobacco to stand in the field to as late a season as circumstances will admit, is that, the riper the plant becomes, the more disposed it is to become yellow, and the more easily is it made to assume that colour after being housed. Indeed, its being of that colour is generally considered by the purchaser as evidence of the stamina, or full maturity of the plant. This, then, is an important consideration in suffering the tobacco to remain in the field as long as circumstances will admit. Being entirely cured, 'tis well to take it down in November or December at farthest, and pack it away in a tight room to prevent it "going and coming," and thereby losing much of its qualities. To take it down, a warm season should be sought, and care taken that there is not too much moisture in it. The planter need never fear its spoiling if the stems will crack when the fingers are applied to them.

If our advice in regard to the management of the article has been carefully observed, and the tobacco nicely assorted and

tripped, and grown on the right sort of and, we will introduce our young friend to he gentleman who will pay him from $20 o $50 per hundred for his crop, if he will ome to us in the month of June next.

But, fie! fie upon us! we have been so vordy upon this subject, the which is so bjectionable to some of our readers that ve wot of that we shall not now be able o talk on those other subjects to the ex- ent we wished. We would like to say a vord to our young farmer friends about naking and applying manure, which is to he farm what Mrs. Jenkins said "grease" vas to religion. "Ah, Mary," says she, 'remember there is no religion without grease!" So there is no farming without manure. We would like to talk about heep, about the hogs, the attention needed or each kind of stock; then we should ave to talk of the culture of wheat and orn—whew! Will our dear young friends uffer us to bore them with another trea- ise, devoted to these inexhaustible themes? We will risk it.

Jan. 7th, 1860. L. M.

The Early English Agricultural Authors.

BY CUTHBERT W. JOHNSON, ESQ., F.R.S.

That the early inhabitants of our island ractised agriculture is well known. That he districts bordering on the English Chan- el were better cultivated than those of the nterior of the island, we learn on the autho- ity of Cæsar. After his expedition to Eng- and, B. C. 55, he described the Cantii, or nhabitants of Kent, and the Belgæ, inha- biting our counties of Hants, Wilts, and Somerset, as the most advanced of our sland tribes in the habits of civilized life. They cultivated the soil, employed marl as a manure, stored their corn unthrashed, and eparated it from the chaff and bran, only as their daily demands required. The inte- rior inhabitants lived chiefly upon milk and flesh, being fed and clothed by the produce of their herds. "The country," adds Cæsar, 'is well peopled, and abounds in buildings resembling those of the Gauls, and they have a great abundance of cattle. They are not allowed to eat either the hen, the goose, or the hare; yet they take pleasure n breeding them." Cicero, in one of his letters, remarks, "There is not a scruple of money in the island; nor any hopes of booty but in slaves"—a description that the industry and intelligence of succeeding ages have rendered singularly inapplicable.

Such are the earliest yet meagre allusions to the farming of our island, in our posses- sion. There is no doubt but that our ances- tors had more agricultural knowledge than we are always willing to believe. And that this skill in the art of tillage did not dimin- ish in succeeding Saxon and Norman days, is equally certain. To the very earliest ex- isting notices of the farming of Saxon times I do not, however, propose now to direct the reader's attention. My intention is to com- mence these retrospective glances, with some of those writings or official notices which appeared from the ninth or tenth centuries to about the year 1532—the year when old Fitzherbert published his work on the Eng- lish farming of those days.

The conciseness and spirit with which these early English writers addressed their contemporaries is well worthy of our notice. They had evidently little faith in the effect of long arguments or half measures. Their works could only be known in manuscript. Printing was, in the days to which I refer, either unknown or merely rudely commenced. Our earliest authors, therefore, imitated, al- most of necessity, the terseness of our early law givers, who practised brevity to admiration. Now it is in the statute books of England, Wales, and the sister-kingdoms, that we find some of the earliest notices of the agricul- ture of our islands. And it is not only an amusing but an instructive inquiry to trace in these laws the primitive notions of our ancestors with regard to husbandry—how bravely former English senates endeavoured to teach farming by acts of parliament; tried to keep not only the prices of food be- low its market value, but of labourers' wages also; how they earnestly strove to protect his growing corn from vermin, from tres- passes of all kinds, excepting game, and how they even endeavoured to teach the men of those times what they should eat, what clothes they should wear, and in what rural sports they should indulge.

Their very limited knowledge of the true principles of political philosophy, indeed, more recent senates have not always ex- ceeded, and modern parliaments have rarely equalled in their laws even the vigor of those of the Houses of Plantagenet and Tudor.

The reader when he is following me through some of these early legislative

writings, must remember that in those days the population of England was in all probability not much larger than that of London now. That the country was undrained, ill cultivated, and that only the richest portions of the land were enclosed, commons and forests occupying the remainder. Of the produce of that portion under the plough, every notice which has escaped to us betrays the poverty. For instance, in 1387, on the manor farm of Hawstead in Suffolk, 66 acres of wheat produced 69 quarters of grain, 26 acres of barley yielded 52 quarters 2 bushels of seed. And about the same period the manor farm of Dorking, in Surrey, produced from 30½ acres of barley 41 quarters 4 bushels of grain, 28 acres of oats only 38 quarters 4 bushels.

The writers, whose works I propose to hereafter notice, are Greathead or Grotehead and Fitzherbert. But previous to this it will be well to take heed of the laws which before and during their time were made to regulate the proceedings of the farmer.

The value of his corn early attracted the attention of our parliaments. In a statute supposed to have been made in 1266, the 51st of Henry III., the municipal authorities of towns were thus directed:—"First, they shall enquire the price of wheat, that is to wit, how a quarter of the best wheat was sold the last market day, and how the second wheat, and how a quarter of barley and oats."

In 1360, by the 34th Edward III., c. 20, the exportation of corn was prohibited. It was 33 years after that time, that in 1398, by 17 Richard II., c. 7, all the king's subjects were allowed to export corn to any but to the king's enemies. This act was not repealed till the year 1603.

In 1436, 15 Henry VI., wheat was allowed to be exported when it was 6s. 8d. per quarter at the place of shipment, and the preamble of the act indicates that the produce of wheat had increased beyond the demands of the population, since it says, when alluding to the restrictions on the exportation of corn, "For cause whereof, farmers and other men *which use manurement of their land*, may not sell their corn, but of a bare price, to the great damage of all the realm."

It is evident from this statute that only some of the most enterprising farmers then manured their corn land. Still they did not so increase the produce of grain as to render their country quite independent of foreign corn; for only a quarter of a century afterwards, we find the first symptom of protecting duties.

In 1453, by the 3rd of Edward IV., c. 2, it was declared that "the labourers and occupiers of husbandrie, within the realme of England, be dayly grievously endamaged by bringing of corn out of other lands and parts, into this realme of England, when corn of the growth of this realme is at a low price." It then proceeds to enact that corn shall not, under pain of forfeiture, be imported into England, until wheat exceeds in price 6s. 8d. per quarter, rye 4s., and barley 3s.

Our old Briti h ancestors long before this time had, however, absolutely prohibited the exportation of corn.

By the old laws of Wales, made certainly not later than the tenth century, (*Ancient Laws and Institutes*, p. 655,) it was ordered that "three things are not to be conveyed to a foreign country, without the permission of the country and the lord—gold, books, and wheat. And three things that an aillt (alien) is not to sell without the permission of his proprietory lord, lest he should want to buy them of him—wheat, money, and horses. And where his lord shall not buy them of him, he is at liberty to sell them wherever he willeth, so that he do not sell them to a foreign country."

In 1533, the act of 25 Henry VIII., c. 2, for a time put an end to the exportation of English corn, and absurdly enough gave the lords of the council the power to declare by proclamation the prices at which farmers and others should be compelled to sell their commodities, although, as the preamble of the act much more wisely allows, "dearth, scarcity, good cheap, and plenty of cheese, butters, capons, &c., and other victuals, happeneth, riseth, and chanceth, of so many and divers occasions, that it is very hard and difficult to put any certain prices to any such things."

Long before the resolute days of stout old Harry the VIII., the legislature had been at work heartily endeavouring to reduce the price of provisions below their market value, for in 1266, by the 51 Henry III., it was ordained (and this statute was not repealed until the 8th of Ann, c. 18) that "when a quarter of wheat is sold for 11d. then wastel bread of a farthing shall weigh 6 lbs. and

3 pennyweights, (a pennyweight round and ithout any defacing, was to weigh 32 wheat orns in the midst of the ear, and 22 penies do make one ounce, 12 ounnes a lb.") nd by the same statute it is provided that when a quarter of wheat is sold for 3s., or s. 4d., and a quarter of barley for 1s. 8d., r 2s., and a quarter of oats for 1s. 4d., then rewers in cities ought, and may well afford sell two gallons of beer or ale for a penny, nd out of cities three gallons for a penny."

The parliament of those times were evitently in earnest in their endeavours to keep ie bakers and brewers in order, for during ie same year (1266) was passed the "statte of the pillory and tumbrel," which also ontinued in force till the time of Queen nne. This, like all our early statutes, eshewed all unnecessary verbiage. The stout arons of that year thus commenced their ct: "If a baker or brewer be convict beause he has not observed the assize of bread nd ale, the first, second, and third time, he hall be amerced according to the offence, if be not over-grievous; but if the offence e grievous and often, and will not be corected, then he shall suffer punishment of ie body, that is, to wit, a baker to the pilory, the brewer to the tumbrel or some ther correction."

We may suspect by this marked distinction between the punishment of the bakers nd the brewers, that even then brewers ere held to be in a larger and more dignied way than the bakers, since they were to e allowed the privilege of riding in a umbrel.

A certain degree of humanity was dislayed by the legislature, even in punishing ascally bakers, for by another statute made bout this time, (Ruffhead, vol. i., p. 186,) was provided that a baker should only be merced "if his bread be found lacking one arthing in two-and-sixpence:" but if his hort weight exceeded this, he was to be laced in the pillory. And further, it was umanely provided that "every pillory, or tretch neck, must be made of convenient trength, so that execution may be done pon offenders without peril to their bodies." he unprincipled butcher, by another statte, (*ibid*, p. 187) was subjected to the same unishment, "who selleth swine's flesh mealed, or flesh dead of the murrain."

The lawgivers of the iron days of Cressey nd Poitiers had evidently an interest in ther viands beyond mere beef and mutton, for in the act of 1363, (37 of Edward III., the statute of Westminster, made by the king, lords, and commons,) we find that ,'for the greath dearth that is in many places of the realme of poultrie, it is ordained that the price of a young capon shall not pass threepence, and of an olde capon fourpence, of a pullet one penny, of a goose fourpence, and in places where the prises of such vittailes bee less, they shall holde without being enhanced by this ordinance. And that in the townes and markets of upland, they shall be soulde at a less prise according as may be agreed upon between the seller and the buyer." This wise law was not repealed until the year 1624.

More than two centuries after this absurd poultry statute, we find the parliament imitating this necessarily abortive attempt to run counter to market prices, by an act to regulate the price of butchers' meat. In the year 1532, by the 24 Henry VIII., c. 3, an act which was not repealed till the year 1541, it was declared in "an act concerning flesh to be sold by weight," that all beef, mutton, veal, and pork, should be sold by "haberdepois" weight, and moreover that no person should thereafter take "for any pound weight of flesh of the carcasses of beefe or porke, above the price of an halfpenny, and of mutton or veale, above the price of one halfpenny and half farthing," and after endeavouring to enforce these prices by a penalty of 3s. 4d., it gravely continued: "Provided alwaies that the heads, necks, inwards, purtenances, legs, nor feet, shall be counted no part of the carcasses aforesaid, but such to be sold for a lower price."

The parliament were not content with fixing the price of calves' meat: they even declared what a butcher should not kill; for instance, in 1529, we find in the old statute books (the 21st Henry VIII.), "An Act against the Killing of Calves" for three years, because, as the framers of the Act gravely inform us, "of late yeeres now passed the breeders of such calves, of their covetous minds, have used to sel their calves young sucking to butchers, weining, rearing, and bringing up few or none, whereby the increase of the old cattell is marvelously minished and decreased." A penalty of 6s. 8d. is then imposed upon any one who should kill a calf during the next three years.

As might be reasonably expected, the far-

mers evidently evaded this act very extensively. But the Legislature was not to be turned aside from their grave resolves; so in 1532, by the Act of the 24th Henry VIII., c. vii., after explaining in its preamble that the act of 1529 was intended to provide "that calves once wained should not be put to slaughter before they were of convenient yeeres and meete for beefe," but that since the last act divers bad persons had continued "to kill young beasts called wainlings, steers, bullocks, and heifares, of one or two yeeres old, or little more," it goes to enact that no person shall, under a penalty of 6s. 8d., cause any cattle to be killed under two years old.

Then, again, the same parliament had evidently discovered another mare's nest; they deemed the increase in the price of mutton to have arisen from the flocks of England having become too large: so, as usual with them, they were prompt in attempting the remedy of an Act of Parliament.

In 1533, therefore, the 25th Henry VIII, c. 13, is an act entitled, "Concerning the number of sheep one should keep." After describing at some length the several enormities that do ensue by the greedy desire of having many sheep—some persons then having 24,000 and 20,000 sheep—"by which a good sheep for victual that was accustomed to be sold for 2s. 4d., or 3s. at most, is now sold for 6s., or 4s., or 3s. 4d., at the least;" it goes on to enact that no one shall have more than 2,000 sheep in future, under a penalty of 3s. 4d. for every sheep above that number. And by sec. 14 of the same act, it is provided that no one shall hold more than two farms, under a penalty of 3s. 4d. per week they shall hold any land contrary to the act.

And the legislatures of those days were not content to regulate the number of sheep a farmer should keep, and the price he should obtain for his mutton, but they regulated the trade in his wool. It was not to be exported, or, when it was allowed to be sent out of the kingdom, it was carefully provided that it should be sent only to the staple at Calais. I have not found in the English statute-book any direction as to how he should *shear* his sheep; but the Scotch government early issued directions similar to that of the Irish parliament of 1634.

The public acts of those days inform us that even as late as the seventeenth century the flockmasters of Ireland and Scotland had a summary way of gathering the wool from the sheep, which their rulers were enlightened enough to restrain. Thus, by the act of the Irish parliament, (11 and 12 Charles II, c. 15,) entitled "An act against plowing by the tail and pulling the wool off living sheep," it is declared that "in many places of this kingdome there hath been a long time used a barbarous custome of ploughing, harrowing, drawing, and working with horses by the tayle, whereby (besides the cruelty used to the beast) the breed of horses is much impaired in this kingdome. And also divers have, and yet do use the like barbarous custome of pulling off the wool yearly from living sheep, instead of clipping or shearing them." These miserable practices were then declared to be illegal, and to be punishable with fine and imprisonment.

It is evident, however, that there had been a previous Irish ordinance on this subject, since such a reformation is referred to in a letter written to his Scotch council by King James, in 1617. Chambers' (Annals of Scotland, vol. i., p. 471,) gives an extract from a curious entry in the Scotch Privy Council Record. The document states that "In some remote and uncivil places of this kingdom an old and barbarous custom was still kept up of *plucking the wool from sheep instead of clipping it.*" The king hearing of the practice, wrote a letter to his Council, denouncing it as one not to be suffered; telling them that it had already been reformed in Ireland, under a penalty of a groat on every sheep so used, and was "far less to be endured in you." The Council immediately (March 17, 1617) made an order to the same effect; and after stating that many sheep died in consequence of this cruel treatment, concluded with a threat of severe fines on such as should hereafter continue the practice. "It is remarkable," adds Mr. Chambers, "that in the Faroe Islands there is to this day no other way of taking the wool from sheep than that which was then only kept up in remote parts of Scotland."

It was as early as the year 1337 that we find the exportation of English wool prohibited. The same measure of injustice to the farmer was conferred in 1521. And in 1696 the *wisdom* of Parliament was evinced by the prohibition of the export of wool

from England, or even from Ireland into England. It was not till the year 1824 that the Acts of Parliament restraining the exportation of wool were repealed.

The Scotch Parliament were by no means to be outdone by that of England; for so late as the year 1581, in the seventh Parliament of James VII., of Scotland, it was enacted, "That no manner of wool be transported, or put in schippes or boates to be transported, furth of this realm in time cumming." A law had been previously made, in 1467, that no cattle or sheepe should be sold out of the realm of Scotland; and again in 1535, by the fourth Parliament of James V., of Scotland, it was directed, with all becoming gravity, "That na manner of men in time cumming sell nolt, sheepe, or other cattle, auld nor young, to ony English-men, be himselfe or ony other mediate person, nor have nor send the samin in England to be sauld."

It sounds strange in our ears to read in these Scotch acts the title of "James, by the grace of God, King of Scotland, England, France, and Ireland."

We have seen how, previously to 1634, the Irish were wont to fasten their horses to the plough by their tails; and there is some reason to conclude, from a print in a Saxon manuscript, now in the Harleian collection, that our Saxon ancestors did the same. I find no act in the English or Scotch statute-books relating to so barbarous a custom: not but that the Caledonian senate legislated upon the horse; they regulated his shoeing, and restrained his owner from over-feeding him. For in 1477, by the tenth Parliament of James III., it was enacted, "because ignorant smithes, through ignorance or drunkennesse, spillis and enrickis mennes horse," that a smith shoeing a horse in the quick should pay the cost of the horse till he be whole, and furnish the owner with another; and if the horse will not mend, that the smith hold the horse. And in 1581, by the seventh Parliament of James VI., of Scotland, "that none under a baron or landed man, worth a thousand merks of yearly free rent, keep horse at the hard meat after the 15th of May, or take them in before the 15th of October, on pain of forfeiting the horse." And the reason assigned is "that amangis the monie uther occasions of deurth of victuallers, there is ane speciallie very unprofitable to the commonweill, quhilk is the holding of horses at hard meat all the summer season, used commonlie be personnes of mean estaite, cowppers of intention to make merchandise of the said horsis, being for the maist part small nagges, and na horses of service."

The parliament who, in 1533, regulated the number of sheep a farmer should keep, had more enlightened views in regard to the encouragement of the linen manufacturers. They erred strangely, however, when they tried to enforce the cultivation of flax on all soils. It was in 1532 that, by the 24th of Henry VIII. (repealed in 1592 by the 35th Eliz., c. 7), it was enacted, after a well-drawn preamble, setting forth the advantages of encouraging the home manufacture of linen, that every person having arable or pasture land "apt for tillage" should every year for every sixty acres in their possession sow "one rode or one quarter of an acre with line-seed, otherwise called flax-seed or hemp-seed."

Here, again, the Scotch parliament had long preceded that of England in regulating the husbandman's crops. In 1426, by the fifth parliament of James I. of Scotland, it was enacted that "ilk man tailand with a plauch of aucht oxen sall saw at the least ilk zeir a firlot of quheate, half a firlot of pease, and forty beanes, under the paine of ten shillings to the baronne of the lande that he dwellis in."

When the English Parliament regulated the crops and the prices of the farmer's produce, they proceeded to consider what they deemed the enemies of his growing corn. We find, indeed, that they thought of the crows, for in 1532, by the 24th Henry VIII. c. 10, intituled "An Act for the Destruction of Crows and Rooks," the preamble informs us that "Forasmuch as innumerable numbers of rooks, crows, and choughs do daily breed and increase throughout this realm, which do yearly destroy, devour, and consume a wonderful and marvellous great quantity of corn and grain of all kinds, in the sowing, ripening, and hemelling, and over that a marvellous destruction and decay of the covertures of thatched houses, barns, reeks, stacks, and other such like, to the great damage and undoing of a great number of all the tillers, husbands, and sowers of earth;" it therefore provides that every town and hamlet shall provide crow-nets; and that takers of crows have two-pence a dozen by way of reward. This sage law was repealed in 1576, by the 18th Eliz., c

15. It is noticeable that a century before this the Parliament of Scotland had made an onslaught on the poor rooks, for in 1424 was passed an act against the "bigging of Ruikes in Trees," because, as the statute adds, they "dois greate skaith upon cornes."

Straying cattle were not neglected. It might be moreover concluded, from the great minuteness with which the damage done by stray cattle is specified in our old Welsh laws, that either the farmers' fences in those times were generally in a dilapidated state, or that the Welshmen were as litigious then, as sometimes they are supposed to be now. By the laws of Howell Dda, made in the early part of the tenth century, it is provided that, "to release an animal impounded, money payment only is due—a penny for a horse, a half-penny for a bullock, for a colt 14 days old one penny.

Every crop that a person shall harvest he is to look after, and the cattle are free. By the crop is understood corn after it is severed from the land, wherever it grew, the produce of an orchard, cabbage, flax after it is cut, or in a garden uncut, tedded hay, thatch for houses, and their fences, leeks, and everything that pertains to a garden. "Let him fence so strong about his garden that beasts cannot break into it; and if he do not, and it should be broken into, he is not to be compensated; except for the trespass of poultry and geese, because it is not possible to fence, so as to exclude them, since they can fly." Then t e law continued: "The barns are to be open from the time the first sheaf is brought into them until the calends of winter, to admit the air; and if the corn be damaged during that period, the owner is to be compensated. From the calends of winter onwards, the barns shall be closed in the manner required: they are to be closed by three eatherings on the sill, and a wattle upon the doorway, with three bands thereon, two on the back, and one on the front; and if that be broken, the corn and the barn are to be compensated, the corn in the barn by giving a whole sheaf for every damaged sheaf." (*Ancient Laws and Institutes*, p. 158.)

Former, and indeed, all subsequent Parliaments, have treated other enemies of growing crops, viz., game, much more gingerly than they did the cattle and the crows. This is shown by their forest and their game laws. The abhorrence of poachers, in fact, amongst the landowners of those iron days, was evidently as great as in our more silken, or cotton times. They took very decisive measures, however, in the 13th century to abate such unqualified destroyers of game. In 1293, by the 21st Edward I., it was enacted, "To the intent that trespassers in forests, chases, parks, and warrens, may more warily fear hereafter to enter and trespass in the same than they have heretofore," that they might be *killed* if they refused, on demand, to surrender themselves to the keeper or his assistants. This slaying, however, the statute gravely and humanely provided, must not be done by the keepers out of malice, and merely on the pretence of a trespass.

A century afterwards, we find that even slaying poachers did not stop poaching, for in 1494, 11th Henry VII., c. 17. It was provided, that no one should set "snares, nets, or other engines," to take "fesants or partridges." And a quarter of a century nearer our own time, by another act, that of 1522 (14th and 15th Henry VIII., c. 10), the hares were protected, since it was then rendered felony to kill hares by tracing them in the snow; the fine being 6s. 8d. upon all breakers of the law.

The treatment of the farm labourers in the times of which I am speaking was evidently harsh and unfeeling. They were, indeed, serfs, who only very slowly participated in that freedom for which the Commons of England so long, and at last so successfully struggled. But the state of the poor labourer from the time of which I am speaking down to the days of Henry VIII., was still that of serfdom. Runaway idlers were to be enslaved; sturdy incorrigible beggars might be executed as felons. This unhappy state of the poor labourer in husbandry must be remembered, when we read the harsh statutes by which their work, their wages, and even their dress, was regulated by grave acts of the rude Parliaments of other days. The labourers were then not even allowed to abstain from work when they did not require to be hired; for 1349, 23rd Edward III., by "the statute of Labourers," it was provided, as the preamble states, in consequence of the great pestilence having carried off so many of the ploughmen, and labourers having increased their demands for wages, that "every person able of body under the age of 60 years, not having to live upon, being required, shall be bound to serve him that doth require him, or else

committed to the gaol until he find surety to serve," at the old wages. And he was not allowed to learn any craft or trade; for in 1388, by the 12th Rich. II., it was ordered, that whosoever served in husbandry until he was twelve years of age, should so continue. The Irish Parliament in 1447 passed an act to the same effect; and in 1425, the Scotch Parliament, to prevent idlers in rural populations, made a law "that ilke man of simple estate that suld be of reason labourers have onther (either) halfe-an-oxe in the pleach, or else delve ilk day seven fute of length and seven of breadth under the paine of ane oxe to the king."

Seldom was the husbandman to have the market value of his labour, for in 1350 by the Act of the 25th Edward III., c. 1, which remained unrepealed until the year 1563 (Eliz. c. 4), it was enacted "That carters, ploughmen, drivers of the plough, sheapheardes, swineheardes, and all other servantes, shall take liveries and wages accustomed the soil twenty yeeres, or four yeeres before (by the previous acts of the same reign), so that in the country where wheat was wont to be given, they shall take for the bushell ten pence, or wheat at the will of the giver, till it is otherwise ordained. And that they be allowed to serve by an whole year, or by the other usual termes, and not by the day. And that none pay in the time of sarcling or heiemaking but a penny the day; and a mower of meadowes for the acre fivepence, or by the day fivepence; and reapers of corn in the first weeke of August twopence, and the second weeke three-pence, and so on till the end of August; and less in the country, where less was wont to be given, without meat or drinke or other courtesie to be demanded, given, or taken. And that all workmen bring openly in their hands to the merchant towns their instruments, and there shall be hired in a common place and not private. Item—That none take for the thrashing of a quarter of wheat or rie over 2½d., and the quarter barlie, beans, peas, and otes 1½d. if so much were wont to be given; and in the country where it is used to reape by certain sheeves, and to thresh by certain bushells, they shall take no more, nor in other manner than was wont the said twenty yeare and before. And that the servants bee sworne two times in the year before lord stewards, bailliffs, and constables of every town, to holde and doe these ordinances. And that none of them go out of the towne where he dwelleth during the winter to serve the summer, if he may serve in the same towne, takeing as before is said. Saving that the people of the counties of Stafford, Lancaster, and Derby, and the people of Craven, and of the marches of Wales and Scotland, and other places may come in the time of August and labour in other countries, and safely return as they were wont to do before this time. And that those who refuse to take such oath, or perform that that they be sworn to, or have taken upon them, shall bee put in the stocks by the said lord stewards or constables, by three dayes or more, or sent to the next gaol, there to remaine till they will justifie themselves. And that stockes be made in every towne by such occasion betwixt this and the feast of Pentecost."

By the same statute, threshers, "tyler and other coverers of ferne or strawe, were to have 3d. per day, and their knaves 1d." We might reasonably conclude with such wages there could be little fear of the labourers decking themselves in fine garments; but it seems that the Parliament of that time thought differently, for in 1363, by the 37th of Edward III., it was enacted "That carters, ploughmen, drivers of the plough, oxeherds, kowherds, shepherds, and all other keepers of beasts, threshers of corne, and all manner of people of the estate, of a groome attending to husbandry, and all other people that have not fortie shillings of goods nor chattels, shall not take nor wear no manner of cloth, but blanket and russet wool, of twelve pence, and shall weare the girdles of linnen, according to their estate, and that they come to eate and drinke in the manner pertaineth to them, and not excessively; and it is ordained, that if any weare or doe contrary to any of the points aforesaid, that he shall forfeit against the King all the apparel that he hath so worne against the form of this ordinance." This wise statute was not repealed till the year 1533, 24th Henry VIII., c. 13. The Scotch labourers in husbandry were probably more economical in their dress, for it was not till about a century after this English Act, that the Parliament of Scotland in 1457, resolved "That na labourers nor husbandmen weare on the warke day, bot gray and quhite, and on the halie daie bot light blew, greene, redde; and their wives right swa, and courchies of their awin making, and that it exceed not the price of xi pennyes the elne. And that na

woman cum to Kirk nor mercat with her face mussalled or covered that she may not be kend."

But not only, it seems, did the English peasantry of that time indulge in fine clothes; but they had, it seems, a taste for wearing arms and bucklers, and for certain amusements. As, in 1388, (by the 12 Richard II., c. 4, made at Canterbury,) it was enacted that "no servant of husbandrie or labourer shall henceforth wear any buckler, sword, or dagger; . . . . but such servants shall have bowes and arrowes, and use the same the Sundayes and holy dayes, and leave off playing at tennis or football, and other games, called coytes, dice, casting of the stone, kailes, and other such importune games."

As time wore on—it became necessary to alter in some degree the wages of the rural population and to decide the length of their working hours. So the Parliament again interfered; and in 1513, by the 6 Henry VIII., cap. 3, (repealed very soon, however,) the wages of a bailiff were slightly raised to 26s. 8d. per annum, and meat and drink, with 5s. for clothing; and a common farm labourer 16s. 8d., and meat and drink, and 7s. for clothing; but then the labourers of those days were evidently not very fond of their hard work, so it was resolved to try and stimulate them by a section of the Act, in the following word: "And furthermore were divers artificers and labourers retained to work and serve, waste most part of the day and do not deserve their wages, sometimes in late coming to their work, early departing therefrom; long sitting at ther brakefaste, at their dinner, and at their noone meate, and long time of sleeping at afternoone to the losse and hurt (of their masters.") It then proceeds to enact, that from the middle of March to the middle of September every labourer "Shall bee at worke before five o'clock in the morning, and that he have but half an hour for his breakfast and an hour and a halfe for his dinner, at such time as he hath season for sleepe appointed him by the said statute, and at such time as it is herein appointed that he shall not sleepe; then he to have but an hour for his dinner, and that he depart not from his work till between the hour of seven and eight in the evening." And then the labourer was not to give up his service without due notice to his master. There was no provision, however, against the master suddenly discharging his labourer; but in 1444, by the Act 23 Henry VI., cap. 12, it was ordained that all servants in husbandry should give warning before they left their service, and that the wages of a bailiff should be 24s. 4d. by the yeare, and clothing price of five shillings, with meate and drinke; of a chiefe hind, a carter, or chief shepherd, 20s., and clothing 4s., with meate and drinke; a common servant of husbandry 15s., and clothing 3s. 4d.; a woman servant 10s., and clothing 4s., with meate and drinke."

Long before this time—even as early as the tenth century—the laws of Wales regulated the ploughman, placed a value upon his gear, and protected him at his work. One law says, "There are three common protections: The protection of a session, or court of country; the protection of a place of worship; and the protection of a plough and team at work."—*Ancient Laws and Institutes of Wales*, p. 666.

By another law it was ordained that "the legal value of a yoke and its bows shall be one legal penny, a beam 1d., a coulter 4d., a cleansing hurdle 1d., a cleansing spud 1d., a harrow 1d., a thorn harrow 1d."—*Ibid.*, p. 150.

By a third law it was declared that neither horses, mares, or cows were to be put to the plough; and again, "No one is to undertake the work of a ploughman, unless he know how to make a plough, and nail it; for he ought to make it wholly from the first nail to the last, or from the smallest to the largest."—*Ibid.*, p. 156.

The value of domestic animals was also fixed by the ancient laws of the Cymri, (*Ibid.*, p. 128.) A foal till fourteen days old was to be deemed worth 4d., afterwards 2s.; at a year, 4s. A working horse that shall draw a car and a harrow, 60 pence; a cow calf, 4d.; of a cow ready to calve, 40 pence; of a steer, 16d.; a lamb, 1d.; of a sheep, 4d.; of a sucking pig, 2d.; of a pig, 1s. 3d.; of a kitten 1d.; of a cat, 2d.; of bees, an old stock, 24 pence; of a 1st swarm, 1s. 4d., of a "bull swarm," 1s.; of the 3rd swarm, 8d.

The old Welsh laws also limited the amount of grass land which a farmer should hold, and the trees he should cut down. By one law: "No one except a lord was to have more than two reserves of grass—a field and a meadow (land appropriated for hay only, and enclosed by a fence;) and if he will to keep it, let him obtain a cross

from the lord; and, under sanction of that, let him keep it."—(*Ant. Laws of Wales*, p. 160.) Another declares that there are "three trees that it is not free to cut without the permission of the Countrey and the Lord an acorn tree or oak, and a birch tree, with a witch elm."—(*Ibid.*, p. 676.)

The breadth of the ancient roads of our island, as fixed by the ruling powers, indicates the limited extent of the traffic they were intended to accommodate. One law declared that "The measure of a lawfull road is a fathom and a half, (9 feet;) of a bye-road, seven feet. Every habitation ought to have two footpaths, one to its church and one to its watering place."

I have continued my notices of these legislative interferences with the farmer and the labourer down to the time of Groteland, Fitzherbert, and Henry the Eighth. Before their age there were no English writings on agriculture that can give us any material information with regard to the practice of our early husbandry. (Of Grotehead and Fitzherbert I shall speak in a subsequent paper.) Those doings of our early Parliaments, which I have been endeavouring to trace, do not give us, it is true, a very elevated opinion of either the state of the tillers of the soil in the olden times of England, or of the wisdom of their Parliaments. These, however, yield us not only considerable information with regard to some of the practices and habits of farmers at a distant period; but, moreover, they may well serve to warn the Parliaments of after and more enlightened times that the less the agriculturists of England are interfered with by acts of Parliament, the better it will be for their prosperity, and that of the country they so admirably cultivate.

From the American Stock Journal.

Importing Stock instead of Breeding it at Home.

Editor American Stock Journal:

As it is supposed that none but animals of superior excellence are imported, it will be understood that the following remarks apply to animals procured on account of apparent superiority, which however may or may not ultimately prove to be a matter of fact. We are one of many who deny that either as to appearance, quality, size, health or intrinsic value, the average of British cattle are superior to the average quality of those in our midst. But admitting that superior results in the niceties of form, quality, color, or all of them, have been wrought out by English breeders, are there not reasons, cogent and numerous, against *generally* importing thorough-bred cattle?

It is the prevalent sentiment of most competent English breeders and judges, that no national improvements have for several years been effected in the three old breeds of Herefords, Devons and Short-Horns; and it was the accumulated evidence of this fact which led to a change in the long established policy of the Royal Agricultural Society—such change consisting in the offering of premiums for specimens of new breeds, instead of limiting their patronage to those in which no further real excellence appeared likely to be developed. It is contended that not only has no improvement of importance been effected by giving white faces, for instance, to the Herefords,—which, however, does not affect their intrinsic value; and greater tenderness, probably resulting from more general confinement, with a slight increase of size, perhaps, in the Devons, but that actual deterioration has taken place in the Short-Horns—the most numerous of the whole. In view of this result, the Royal Agricultural reviewer, Robert Smith, in his review of the Chester exhibition, says of this breed, that "it would be well if more attention was paid to their *lean* meat, and less to superfluous fat. * * * Rather than to encourage male animals of a smart heifer-like cast, without lean meat-quality with substance being really essential." This to our view is affirmation, not only of depreciation but also of the necessity of an improved method of breeding the Short-Horns. And if the British breeders, whose skill we so much patronize, have committed such radical errors, what can be expected of the imported animals so bred? What but the repetition of similar errors, already abundant here?

If, however, the present standing of these breeds was entirely satisfactory, still the fact remains that for many years they have been bred in sufficient numbers in this country to admit ample selections being made, without risking deterioration from too close breeding. Thus for years there has been no particular necessity requiring the importation of animals for the sake of new or better selections. But if there were such a necessity, there is still the fact of *inevitable* deteriora-

tion generally in the animals thus introduced, not necessarily so much in consequence of excess as of great changes in the natural quality and bulk of feed, unless in some excepted instances, from favorable local resources and great care, is to be checked for at least a while, and in instances such as here contemplated deterioration be partially prevented, the product of breeding in such conditions would not be a means of general improvement, because similar deteriorations from causes of the same nature must inevitably befall such animals when transferred to our general quality of feed and conditions of climate; and, moreover, animals produced in unusually favorable conditions obtain a fictitious reputation that could not accrue to them nor be justified under less favorable but more usual circumstances.

It is reported that Mr. Alexander, of Kentucky,—the largest breeder in the South—believes he has bred a better bull for his purpose (which is that of raising stock for breeding from,) than he could import; and in this he is most likely correct, and certainly his spirit and judgment in this matter are most admirable, and cannot be imitated without advantage on all hands. The general superiority of the American horses is admitted, of which the creditable achievements of some of them on English Turf is an illustration at hand. Then as to fine wooled sheep, England itself is certainly not up with us. If we consider the extent of intelligence and capital of our successful horse breeders—generally by no means of unequalled amount—what in these respects is lacking to prevent our breeders of good cattle achieving equal, or even more important improvements? All that is attainable by importing the old breeds is novelty—not improvement—a mere economical fiction. For no material advance having been made in them for years in England, it is absurd to anticipate further advantage from that quarter, except on the principle of "light from no light," which is equivalent to hugging a most egregious illusion.

We export pork, and beef, and grain in large quantities. Should we not rather convert a portion of our grain into improved stock, and export it in a more concentrated and living form, equally for economical reasons, and to illustrate American skill in breeding animals, as entitled to rank with that of other arts? Must American breeders of stock accept a position not only dependent as to British skill, but also a secondary, as practical men in their own day and country? We hope not, for we believe that from its number and aggregate value, every leading branch of agriculture should be distinguished by the skill displayed in it as much beyond that of other professions as it is more general and vital in importance in every respect.

When improvement is a probable result, the importation of animals of *new* breeds cannot reasonably be objected to; but on the other hand, caution and judgment—such as Sanford Howard appears to have exercised in making examinations and selections of recent importations, are highly necessary in deciding on the probabilities of improvement: for as failure will ensue in some cases, it is necessary to know beforehand the reasons why success should follow in others. Importing under such circumstances, is not a one-sided dependent policy, like that of constantly importing old established breeds, for reasons frequently humiliating and absurd. Importations of this character are made either because Britain is supposed to have greater skill, or a better climate, if that of England be really better—of which we say nothing here—then it is nothing less than sheer recklessness to transfer *their* animals to the inferior and consequently deteriorating conditions of a different climate, and the necessarily equal different character of its productions—devoted to feeding stock. A little credulity is doubtless a very good thing, because the "pleasure is as great of being cheated as to cheat." But to say that a great stock country like this, can most advantageously import, instead of produce superior animals for the purpose of general improvement—which construction is justified by the present practice—is a little too much trifling and dallying with a too confiding credulity,

The policy of importing, having too slender grounds to avail by reason of the numerous weighty objections against it, ought to be changed as that of the Royal Society has been—a precedent for you, Messrs. breeders—or more properly, *reversed*. And this because while imported stock will inevitably continue to deteriorate generally, stock sent from here to England would as certainly improve, and consequently create a demand for more of our animals. This would result because their crisp, watery, sweet and tender root feed and grasses must produce

greater bulk and rotundity in the animal, and more tenderness and juciness, though *not* nutriment, in his meat. The handling qualities of American animals would generally much improve with English feed, from the increase of suppleness in their hides, and mellowness of flesh, resulting from, and corresponding to, the greater nutrition of feed. Moreover, the manufacturing "beef eaters" of England would be sure to pay "Brother Johnathan" a good price and find him a steady market for a superior article. A creditable degree of spirit, and the general interest alike dictate the policy of at least reciprocal exchange, rather than exclusive importation on our part; and if American breeders cannot produce cattle with equal skill to that of English breeders, and with points and qualities peculiarly American, after a fair trial, let us know the reason why? for a great flock country like this, ought to produce its own breeders, and at least some peculiar breeds, and the sooner this is done the better it will be for the general stock interest and all parties concerned.

J. W. CLARKE.

Vegetable Ivory.

The Ivory Nut Tree, or, as it is popularly called by the natives of South America, the Tagua Plant, is common in that country, and we believe also in the southern portion of our State. If this should prove to be the fact, and from the testimony before us we have no reason to doubt it, it will eventually form no small element among the resourses of our still wealth-prolific country. It is a tree which belongs to the numerous family of palms; and in one division of that order denominated by botanists, the Screw Pine Tribe. In South America, where they are found in great abundance the natives use them to cover cottages, and from the nuts they make ornaments, buttons, and various other articles. In an early state, the nuts contain a sweet, milky liquid, but afterwards assume a solidity nearly or quite equal to ivory, and will admit of a high polish. Europeans and our own countrymen call it the Ivory Nut Tree, or Vegetable Ivory; and it has recently been introduced into the bone and ivory manufactories of both England and the United States, where it is brought into use quite successfully, for various purposes as a substitute for ivory.—Ex.

The "Prof." Done Over.

A few weeks since we copied from the Homestead, a sterling agricultural paper published at Hartford, Conn., the analyses by Prof. S. W. Johnson of four specimens of Prof. Mapes' Super-phosphate of Lime. It was the report of Prof. J. to the State Agricultural Society of Connecticut.

In that table Prof. J. demonstrated that the actual value of Mr. Mapes' compounds ranges from $12 10 to $22 24 per ton, while the price charged for the same by Mr. Mapes is from $40 to $50 per ton!

For placing this reliable and valuable information before our readers, Mr. Mapes addressed a long communication to us charging us with attacking *him*, asking us to publish a column or two in laudation of this same compound, which Prof. Johnson had shown to be worth not half the price charged for it.

In reply, we assured Mr. Mapes, that should he furnish the Homestead with the evidence of error on the part of Prof. Johnson, we should take pleasure in transferring such communication to our paper. Mr. Mapes saw fit to forward to the Homestead the paper addressed to us. We therefore give him the full benefit of the article, with the commentary of the Homestead.

Prof. Johnson tried Mr. Mapes' superphosphates in the crucibles of the Laboratory of Yale College. The results are far more favorable than in the experiments we made ourselves in the great laboratory of nature. In our greenness with such special manures, we paid Mr. Mapes one hundred dollars for two tons of his "super-phosphate of lime," and caused the same to be carefully applied to various crops, but without the evidence that the first dollar of benefit was derived from its use.

In applying it to the corn crop, two rows through the middle of a large field were omitted in its application. At harvest these two rows, with the two beside them, were carefully husked and measured separately, and without the first half bushel's difference. The application was made by the "Prof.'s" own rule! No more advantage was seen in its application to any other variety of crop, as it was applied to several. Science and nature decide against it.

We purchased, the same season, superphosphate prepared in Connecticut, which

gave a decided increase to the crops where it was applied.

What Mr. Mapes chooses to call "a history" of Prof. Johnson's "conduct towards" him, is substantially the history of the conduct of the editors of a large number of the leading agricultural papers of our country for years past. Till now, we have remained silent.—*Eds. Observer.*

MAPES ON PROFESSOR JOHNSON.

We have recently received a letter from "Prof." Mapes, of super-phosphate (with the super-phosphate left out) notoriety, requesting us to publish an article addressed to the editor of the New York *Observer*, who some weeks since transferred to the columns of the Observer the report of the chemist of the Connecticut State Agricultural Society, upon a class of fertilizers, of somewhat varying qualities and prices, which are known as "Mapes' Super-phosphates of Lime." This report originally appeared in *The Homestead*, and was, as our readers remember, in no way calculated to increase the confidence of the public, either in the manufactures or the representations of the Mapeses, father or son.

Mr. Mapes writes: "You have seen proper to attack me in your paper." We attack no one, but comment freely on the public statements, actions, and pretensions of men, as well as the principles they advocate, and the facts they adduce in support of their views. If a man proves himself a charlatan, it is no attack if we show up the truth so that he can deceive fewer people. We beg our readers (and Mr. Mapes is one of them) to note our position; it is purely defensive, in warning the public and putting farmers and others on their guard against just such abominable impositions as those exposed in the report referred to. Errors of theory or practice, however, we are always happy to *attack*, acting on the *offensive* as long and as far as there is any fight left in them, or as there is any advantage to accrue to our readers.

As for the testimonials, so far as we know, they are from very respectable people: several of them we are personally acquainted with; but what are they worth? Are they testimonials in favor of the application of ammonia to certain soils? Yes. Are they in favor of the action of sulphuric acid? Yes. Of gypsum? Yes. Of soluble or *super*-phosphate of lime? In some cases, yes; in others, probably no—for we know that the material sent to Hartford and sold by J. W. Royce & Co., had no super-phosphate in it, at most no appreciable amount.

All these various substances, each valuable where needed, are in Mapes' manures; they may be of very great agricultural value if needed, but of very little if not needed. Nobody doubts their value, but the question only is, are they worth $13, or $50. A ton of plaster may be applied so as to increase the yield of grass land, or other crops, the value of $100; yet who will say that man is not a *knave*, who sells plaster to the owner of such land for $50 per ton?

But Mr. Mapes attacks with misrepresentations and false imputations a gentleman, and man of science, who, even in these days of elastic consciences, is as firm and inflexible for right and truth, as if he got blessings instead of curses for it. Our readers know and respect Prof. Johnson, and we publish this letter that they may the more effectually know Mr. Mapes.

Editors of the New York Observer:

GENTLEMAN:—* * * Taking it for granted that in common with many others you have suffered yourselves to be deceived by Prof. S. W. Johnson, I beg to give you something of a history of his conduct toward me.

In the early part of 1853, one of the imitators of my Phosphate caused to be published an analysis, (*a*) said to have been made by Prof. S. W. Johnson, of Yale College, (*b*) of my Phosphate, in which he makes the value to be $46, for which I charge $50; and also stating the sulphate of lime necessarily formed by the action of the sulphuric acid on calcined bones, in the making of Super-phosphate, as Plaister of Paris; leaving it to be inferred, that I had added crude plaster in the manufacture. I wrote to Prof. Silliman, senior, to ascertain who Prof. Johnson, of Yale College, was, and then learned that no person of that name held a Professorship in Yale College, nor was there even a student in the College of that name. (*c*) I subsequently learned that this self-styled (*b*) Professor S. W. Johnson, was a student in the analytical laboratory in the yard of Yale College, the use of which had been given to Mr. Porter, to enable him to re-

ceive pupils in chemistry. The associate pupil of S. W. Johnson was Mr. Sol'n Mead, who informed me that Johnson was a fresh student at chemistry, and that this analysis was among the first that he had made, and that he acknowledged to Mr. Mead that my phosphate was better than any of the others he had tried, which included two specimens of English phosphates. This analysis by Mr. Johnson was full of evident errors, (*d*) all of which were pointed out by Dr. Charles H. Enderlin, the former associate of Baron Liebig, and a well known chemist of high standing. This paper will be found in the *Working Farmer*, vol. v. p. 121, and most clearly shows S. W. Johnson to be egregiously in error. For a long time this gentleman was, we believe, absent in Europe; on his return, vituperation seemed to be his aliment, and he immediately published a statement, that although my phosphate was of exceeding good quality when he first examined it, it had deterioriated, giving a new analysis, and evidently repeating the errors pointed out by Dr. Enderlin; he also attacked the result of my experiments carefully made on my own farm, with the mineral phosphates from Dover, Crown Point, and elsewhere, which I pronounced to be valueless in practice, and which have proved so in England and elsewhere, where they have been shipped. In a book lately published by Prof. Johnson, called his "Essays on Commercial Manures," (*e*) he clearly states that mineral phosphates are as valuable as those from bones; consequently, in his opinion, the chlorapatite or phosphatic rock of New Jersey, containing ninety per cent. or more of phoshate of lime, must be superior in quality, when finely ground, to the best bone dust; instead of which these mineral phosphates, even after being finely ground and treated with sulphuric acid, have no value as manure.

All the attacks of this gentleman we have passed by unnoticed, not only those written over his signature, but his anonymous communications published in the *Homestead*. (*f*) We published the affidavit of the foreman and all the workmen at the factory, that no change in quality had ever taken place in the Phosphates there manufactured, and supposed this to be an entire refutation to the assertions of S. W. Johnson, founded upon an analysis, the correctness of which had been entirely disproved, not only by the communication of Dr. Charles H. Enderlin, but by the analysis (*g*) of Dr. Enderlin, Prof. Hosford, of Cambridge, Dr. A. A. Hayes, of Mass., Dr. Antisell, and others, and by the opinion of Prof. Shepard, formerly of Yale College, Prof. Higgins, of Baltimore, and others, and still further disproved by the certificates of hundreds who had used the Phosphates for a series of years.

In the article referred to in your paper, Prof. Johnson commences thus:

"Of all the many fraudulent and poor manures which have been from time to time imposed upon our farmers during the last four years, there is none so deserving of complete exposure and sharp rebuke, as that series of trashy mixtures known as Mapes' Superphosphate of Lime. It is indeed true that worse manures have been offered for sale in this State, but none have ever had employed such an amount of persistent bragging and humbuggery to bolster them up, as has been enjoyed by these."

Now permit me to ask whether this language is befitting the office of a chemist who wishes to do a service to the public, or that of a special puffer, which Prof. Johnson has most undeniably proved himself to be, of volcanic Guanos, which are valueless as compared with Superphosphates. In his recent writings he has lost no opportunity for puffing these misscalled guanos, and his late book is but a card for the venders of these inferior products in his neighbourhood. He then says:

"Seven or eight years ago, Mapes' improved Superphosphate was almost the only manure of the kind on sale in our northern markets; then it was of good quality," etc.

He afterwards says:

"And had a value (calculated on present prices) of $44 per ton; it was sold at $50 per ton."

Why should Prof. Johnson calculate present prices on an article which he states was sold at $50 per ton seven or eight years ago. (*h*) In his accompanying analysis, after admitting the presence of sulphuric acid, he denies the presence of soluble phosphates. This is, as he is well aware chemically impossible.

My answer to the whole of this tirade is, that the sale of Superphosphate in the very district where he resides, and where the

paper is published in which he has written most, namely, Hartford and New Haven, have been five times as great in the year 1859 as any former year, (*i*) and the following certificates from men of the highest standing as agriculturists in his State and elsewhere, received within the current year, are better evidences of the value of the Phosphates, than any analysis or opinion which may be offered by this self-constituted servitor of the public. (*k*)

As you have given place to this unwarrantable attack upon me, I ask in common fairness that you will publish the above, together with the following abridged certificates: (*l*)

Yours, respectfully,

JAMES J. MAPES.

NOTES.

a. This analysis was made by Mr. Johnson when he was an assistant in the Yale Analytical Laboratory, shortly after the publication of sundry papers on manures by Prof. Way, chemists of the Royal Agricultural Society, (if we mistake not,) in which papers the author adopted certain standards of valuation for the different ingredients of high priced fertilizers; and the analyses referred to were made with a view to apply the rule suggested, and compare American superphosphates with English. The importance of the knowledge obtained to agriculturists led Mr. J. to send them for publication to the *Country Gentleman*. We are familiar with the facts because we were at that time connected with the College.

b. The title *Professor* was by error given to Mr. Johnson at that time in some agricultural paper in which the article was published. *He* never *used* the title till he was elected to the chair he now so ably fills, though previously he had occupied a position which would have authorized its use had he chosen. [What college is "*Prof.*" Mapes a Professor in?]

c. He was an assistant, not a student. A mere quibble to draw attention from the real issue.

d. This analysis was the best for the manufacturer ever made of any manure bearing Mapes' name, so far as we have seen published analyses, for the reasons that, first, it showed it to be a *first rate* article, and second, it was expressed in the simplest possible form, names being used that everybody understood, and the statement was so explained that everybody could understand it, just as they now can understand every analysis which we publish from Professor Johnson's Laboratory. Dr. Enderlin was employed by Mr. Mapes to find the analysis and the statement of it at fault, and did his best to do so. All the basis for fault finding was in the use of simple terms instead of chemical terms, and the doctor succeeded in throwing some dust in the eyes of a few people, perhaps. The analysis was not only scientifically accurate, but it conveyed to every one who read it exactly the just view —a very favorable view too—of the manure. Mr. Mapes did not know enough to know it; and so went directly counter to his own interests, in employing a *chemical attorney*, so to speak, to do for him what he thought ought to be done, but could not do himself.

e. See Prof. Johnson's reports in the Transactions of the Conn. State Agricultural Society, 1857 and 1858, and the same embodied in the work alluded to, published by Brown & Gross, Hartford—the most valuable publication on manures ever issued from the American press.

f. No anonymous communications from Prof. Johnson have ever appeared in our columns.

g. Were they analyses of the *can* samples or of the manure as found in the market? For the fact must be known to our readers that Mapes furnishes samples in cans of a very fair quality for trial, and far superior to the common stock in market. Whatever certificates of actual trial on the land or of chemical analyses of his manures Mr. Mapes publishes hereafter, or now asks us to take in evidence, he must prove that he has not had them prepared as he did the can samples, of a superior quality to what he offers for sale in the market. How a man who was *caught* doing such a trick as that has the face to ask us to publish such an article as this, we cannot conceive. We do not doubt Mr. Mapes can make an article of super-phosphate equal to anything in the world, or that anybody in the world can make, and can get it analyzed, etc.,—but the question is, *Does he send it to market?* and to this we answer, *No*, he does not; and more than that, he does send an article which deserves the criticism of Professor Johnson, which Mr. Mapes sees fit to quote.

h. In order to compare it better with that in market now, and calculated on present prices, of course.

i. This may be true, but the sales have been very small in Hartford at any rate, amounting to only four tons all told, as stated by Mr. Mapes's agents here.

k. The State Agricultural Society, in appointing Mr. Johnson their chemist, impose upon him certain definite duties, in fulfilment of which he certainly is no *self*-constituted servitor of the public.

l. We shall not publish the certificates, except as an advertisement, if Mr. Mapes chooses to present them to our readers in this form. The Connecticut men from whom they come are—A. Bagley, New Haven; Morris Ketchum, Westport; John S. Beach, New Haven; Nathaniel Weed, Darien; Nathan Moore, Jr., Stafford, and A. Wetmore, Jr., Stamford. We should be happy to hear from these gentlemen as soon as convenient, or from any other, in regard to their use of this manure—where they obtained it, of whom they obtained it, how much they used, the character of the soil, its previous culture, manuring, etc., the effect of plaster, lime, guano, or any other concentrated or special manure on the same, if known, etc.

[*N. Y. Observer.*

Poultry House.

A good, warm poultry house for fowls in winter, and a cool one in summer, is a useful structure to every man who keeps a dozen or more fowls.

We annex some good suggestions from one of our exchanges, as follows:

"In selecting a site for a poultry house, attention should be paid to the quality of the soil on which it is to be erected, as also its aspect. The soil should be of a warm and dry character, and gently sloping from the front, that the wet may easily run off. The aspect should be such as will secure the greatest possible average quantity of daily sunshine; and it should be as sheltered as possible from sharp or biting winds, or from the driving rain. Every house should be provided with a sufficient quantity of small sand; or, if such cannot be procured, clean ashes are a good substitute; pieces of chalk are also a useful—nay, necessary adjunct; *crude lime* acts, however, as a poison. Some horse-dung or chaff, with a little corn through it, is also a source of amusement to the birds; and recollect, that *amusement*, even in the poultry yard, is materially conducive to health. The ashes and litter should be frequently changed, and had better also be kept in little *trenches*, in order that they may not be scattered about, and may not thus contribute to give a dirty or untidy appearance to the yard. When, however, your fowls have run in a garden or field, of average extent, this *artificial* care will be replaced by nature.

If the court be not supplied with a little grass-plot, a few squares of fresh grass sods should be placed in it, and changed every two or three days. If the court be too open, some bushes or shrubs will be found useful in affording shelter from the too perpendicular beams of the noonday sun, and probably in occasionally screening the chicken from the rapacious glance of the kite or raven. If access to the sleeping room be, as it ought, denied during the day, the fowls should have some shed or other covering, beneath which they can run in case of rain; this is what is termed "*a storm house;*" and lastly, there should be a constant supply of *pure, fresh water.*

Keep your yard as clean as possible. Fowls frequently suffer much annoyance from the presence of vermin, and a hen will often quit her nest, when sitting, in order to get rid of them. This is one of the uses of the *sand* or *dust* bath; but a better remedy, and one of far speedier and more certain efficacy, has been discovered at Windsor by her Majesty's feeder. The laying nests at Windsor are composed of dry heather (Erica tetraix) and small branches of hawthorn, covered over with white lichen. These materials, rubbed together by the pressure and motion of the hen, emit a light powder, which, making its way between the feathers to the skin, is found to have the effect of dislodging every sort of troublesome parasite.

Lichens may easily be collected from rocks and trees, and the nests furnished with them. Rotten wood, thoroughly dried, produces a powder equally destructive to vermin.

The fowl house should also be frequently and thoroughly cleaned out, and it is better that the nests be not fixtures, but formed in little, flat wicker baskets, like sieves, which can be frequently taken down, the soiled straw thrown out, and themselves thoroughly washed; hay is objectionable, as tending to the production of a parasite of the *louse*

tribe, the annoyance of which will often drive the hen from her nest. Fumigation at no very remote intervals, is also highly to be commended. Nothing is of more importance to the well-being of your poultry, than a good, airy walk.

Cleanliness, a free circulation of the air, and sufficient room, with proper kinds and quantity of food, are the conditions on which success in raising poultry principally depends.

Among the most necessary appendages to every poultry house, is the *Hen Ladder*. This is a sort of ascending scale of purches one a little higher than the other; yet not exactly *above* its predecessor, but somewhat in advance. By neglecting the use of this very simple contrivance, many a valuable fowl may be lost or severely injured, by attempting to fly down from their roost—an attempt, from succeeding in which the birds are incapacitated, in consequence of the bulk of their body preponderating over the power of their wing. This would not, of course, take place among wild birds; but we are not to forget that our *improvements* in the breed of all animals tend to remove the varieties on which we expend our care, gradually farther and farther from their primitive condition, and conduce to deprive them of much of their native activity, and as our improvements proceed to render them ultimately almost useless; hence the necessity for such artificial aids as the hen ladder; and perhaps, even in the stable, this accessory is more absolutely required than in less humble poultry houses, on account of the great height of the roosting-place."—*Southern Homestead.*

Results of Art and Science.

Sir David Brewster, the eminent Scotchman, whose successful researches into natural science have covered his name with universal honor, was lately inducted into the office of Principal of the University of Edinburgh, to which he had been unanimously elected. On that occasion he addressed the professors, graduates, and matriculated students of the University, as well as a large crowd of other dwellers in the Scottish metropolis. What he said upon the indebtedness of mankind to the arts and sciences is so true, that we take pleasure in presenting it here. Speaking to the students, Sir David Brewster said:

"There is only one other branch of study to which I am anxious to call your attention. The advances which have recently been made in the mechanical and useful arts, have already begun to influence our social condition, and must affect still more deeply our systems of education.—The knowledge which used to constitute a scholar, and fit him for social and intellectual intercourse, will not avail him under the present ascendency of practical science. New and gigantic inventions mark almost every passing year; the colossal tubular bridge, conveying the monster train over an arm of the sea; the submarine cable, carrying the pulse of speech beneath two thousand miles of ocean; the monster ship, freighted with thousands of lives; and the huge rifle-gun, throwing its fatal but unchristian charge across miles of earth or of ocean. New arts, too, useful and ornamental, have sprung up luxuriantly around us. New powers of nature have been evoked, and man communicates with man across seas and continents, with more certainty and speed, than if he had been endowed with the velocity of the race-horse or provided with the pinions of the eagle.—Wherever we are, in short, art and science surround us: They have given birth to new and lucrative professions. Whatever we purpose to do they help us. In our houses they greet us with light and heat. When we travel, we find them at every stage on land, and at every harbor on our shores. They stand beside our board by day, and beside our couch by night. To our thoughts they give the speed of lightning, and to our time-pieces the punctuality of the sun; and, though they cannot provide us with the boasted lever of Archimides to move the earth, or indicate the spot upon which we must stand could we do it, they have put into our hands tools of matchless power, by which we can study the remotest worlds; and they have furnished us with an intellectual plummet by which we can sound the depths of the earth, and count the cycles of its endurance. In his hour of presumption and ignorance, man has tried to do more than this; but though he was not permitted to reach the heavens with his cloud-capt tower of stone, and has tried in vain to navigate the aerial ocean, it was given him to ascend into Empyrean by chains of thought which no lightning could race and no comet strike; and though he

has not been allowed to grasp with an arm of flesh the products of other worlds, or tread upon the pavement of gigantic planets, he has been enabled to scan, with more than an eagle's eye, the mighty creations in the bosom of space, to march intellectually over the mosaics of sidereal systems, and to follow the adventurous Phaeton in a chariot which can never be overturned."—*Christian Observer.*

The Farm and the Farmer.

"Much of the character of every man may be read in his house." This was a remark of the late Dr. Downing, and though true in the main, must be taken with some modification. Many, had they the ability, would cause their houses to tell a far different story of their character than they now do. The log cabin or the cottage that has weathered the storm for a score of years, would soon come down, and on its ruins a mansion would arise bespeaking its owner a man of taste and munificence, with a spice of vanity and love of display. In one half the cases, persons who build are dissatisfied with the work after it is completed, and too late to make a change without subjecting themselves to great expense. The house may show the character of the architect, but not of the proprietor, unless it is according to his taste. Not one in a thousand, if under the necessity of rebuilding, would make the second house like the first, while many who build fine houses, have little to do with the work aside from furnishing the means.

The *character of the* FARMER, however, may be *read in his* FARM, in the most unmistakable language. He may *write* most elegantly and truthfully, lay down the best of rules, and exhort all to observe them with energy and zeal; he may talk most fluently, deliver agricultural lectures for the enlightenment of his fellow farmers, which all may hear with profit; lay down maxims, which, if followed, would make every man a good farmer, but all this tells not the character of the man. He may violate his own rules, disregard his own maxims, and, like the drunkard who preaches temperance, be a living example of the evils which he condemns. But the farm tells the character of the man in language so truthful and unmistakable that "he who runs may read." There is no opportunity for concealment—no chance for disguise. If the farmer is an enterprising, diligent man, it is told by the horses and cattle in their rounded forms, sleek coats and bright eyes; in their playful, happy freaks, and in their quiet, comfortable repose. It is read in the growing crops and the well filled barns—related to every traveller by the fences and the gates, the barns and the stables. It is heard in the lowing of the sheep, and satisfied grunts from the pig-pen, and proclaimed from the very house-top in the clarion notes of the cock. It is seen in thrifty orchards, in the air of neatness and thoroughness that pervades the whole domain. The farm may be small, the land naturally none of the best, the buildings cheap; but natural difficulties are, as far as possible, overcome, and the owner, it is very plainly to be seen, is the master, instead of the slave of circumstances.

The slothful, negligent farmer cannot hide himself. His character and his faults are emblazoned on the dead tops of his orchard trees, chattered by the loose boards that dangle in the wind; bleated by the half starved calves; told in the pitiful looks and speaking eyes of forlorn horses and cattle. The poor fences and poorer crops, the fine weeds among the corn and potatoes, and finer thistles in the meadow, speak in living words the habits and character of the owner. The farm may be naturally the best in the county, the buildings costly, but these things only set off in more brilliant colors the forlornness that pervades the whole. Were this truth ever remembered, that the character of the farmer is seen in the farm, we think many would strive to have their farms speak for them better things than they now do.—*Rural New Yorker.*

Thick Wind.

BY G. W. BOWLER, V. S.

This disease, though very common in the United States, is more particularly confined to those horses owned by farmers.

It is an affection which prevails more or less in every village, and the true nature of the disease appears to have been buried in obscurity. The causes assigned by many authors, are too numerous to mention. A horse may be what is termed thick winded

from a great many different causes. But what I allude to, is the affliction under which animals are suffering to such an extent at the present time.

We have horses that are thick winded or as they are termed, roarers; which arises generally from a malformation of the larynx. Again we see horses so affected arising from a collection of lymph in the trachea, thereby acting as an impediment to the free passage of air into the lungs.

We also see it in cases where the lungs are slightly tuberculous. But the common every day thick wind arises from no such cause. It is simply brought on by the neglect of the person who raises or has charge of the animal. This may at first sight appear rather strange, and saying a great deal. But from my own personal observations, I have found that the greater number of cases of thick wind, arises from no other cause. We have other diseases before us daily which arise from similar neglect, but take on a different form: I allude to staggers. Some animals are affected by this treatment earlier, and in a different form to others.

That the staggers, as it is termed, arises from overloading the stomach, does not admit of a doubt. And in the same way is thick wind brought on. The stomach and intestines become overloaded with food, which has the effect in course of the time, of increasing the capacity of both the stomach and intestines, from their being continually overcharged with a mass of undigested food. Evidence of this may be seen, if we only observe the vapor which is so frequently passing from the animal.

The enlarged states of the stomach, and intestines, has the effect of causing pressure on the diaphragm and lungs, thereby causing an impediment to the free action of the lungs, and producing the difficulty in respiration which is observed in animals thus affected. The continued exertion to inflate the lungs with air, has the effect in some cases of producing a rupture of the air cells, and when this has taken place the animal is forced to suffer on, so long as he lives. Let more attention be paid to feeding your stock at regular hours, and with a reasonable quantity of food, and you will soon find, that thick winded horses will be as scarce as gold at Pike's Peak.—*Farmer and Gardner.*

The Southern Planter.

RICHMOND, VIRGINIA.

Diseases in Horses.

SWINNEY.

We take it for granted that every Virginian (as he ought to be) is fond of horse-flesh, and that he is always glad to have "a new wrinkle" added to his stock of knowledge in veterinary science. Consequently, we owe no man any apology for devoting some of our time and space to an endeavour to improve the condition of that most noble animal, the horse. In speaking of "swinney," we do not propose to do more than explain the philosophy of the causes which lead to the disease; the existence of which, to our utter amazement, is entirely ignored by some English veterinary surgeons of acknowledged eminence in their profession. It is hard, however, to convince a man that a thing does not exist, when his eyes so often prove to him the contrary, and a satisfactory cause is presented for the phenomena to which his attention is directed. Every man in Virginia, who has ever owned a horse, knows that "swinney" is of frequent occurrence, particularly on farms whose "force" is composed of a negligent overseer and careless negroes. Horses and mules, improperly geared, with *collars too large*, and employed at any hard labor, are almost sure to have it.

Causes.—Pressure applied to the shoulder at improper points, produced by large collars, or badly adjusted haines; lameness from any injury, or "splint," which may "throw him off his feet" for a while.

Thus, if a horse stands for any length of time, with one fore-foot resting, he is almost sure to have "swinney" in the shoulder of that side.

Anything which obstructs the proper circulation of the blood through the muscles of the shoulder, will as surely bring on "swinney" as a failure to take food in proper quantities, and

at the times, when the system demanded it, would produce emaciation. Every muscle is nourished and fed by the blood which runs through its blood-vessels; and, of course, when this supply is cut off, "swinney" results as a natural consequence, since *the disease is simply a wasting* or *emaciation of the muscles*—a want of the accustomed nourishment.

Treatment.—The first indication to be observed, with a view to restoring the diseased parts to a natural condition, is, to re-establish a proper "circulation" through the parts, by giving to the muscles a supply of their natural sustenance, which shall be capable of supplying the waste they have undergone. The first thing to be done, then, is, to use a remedy which will bring to the spot *a flow of blood*, and this can be effected easily on the principles, well known to medical men, that "*wherever there is an irritation, there will be a flow of blood.*"

Blisters and counter-irritants, liniments and frictions, are, therefore, the remedies generally employed. The old-fashioned remedy of inserting a "split" of wood under the skin, and separating the skin from the cellular tissue and muscle, is so barbarous that it should be always discountenanced by every humane man.

The remedy easiest of application, and as effective as any other we have ever seen tried, is, to make a small incision or puncture through the skin, at the lowest point of the disease, into which put the end of a quill, and blow up the skin thoroughly. This operation is almost painless, and may be repeated as often as may be desired with very little trouble, while the skin by the process is very thoroughly lifted by this aerial pressure from the muscles. The next step is to produce as active an inflammation as possible, *between the skin and muscles*, which may be brought about by injecting with a small syringe, through the puncture, any stimulating mixture. Tincture of cantharides is perhaps the best article, or diluted tincture of iodine. A strong decoction of red-oak bark, with some whisky or brandy added thereto, would answer as a substitute for the other articles where they could not be conveniently procured. The effect of the application of these remedies will be the establishment of an active inflammation over the whole surface of the injured muscles, which will be speedily followed by suppuration of a healthy character, the deposit and organization of lymph, by which the sunken places will be filled up, and the horse brought again to a sound and useful condition.

The worst case of "swinney" we ever saw was cured by this method, which, although not *new*, is known to comparatively few horse owners.

"HOOF BOUND."

This name is given to a thickening of the crust, or external wall of support to the foot. A great many cases of lameness are produced by it, which are usually attributed to other causes. The horse with his foot in this condition, is able to move about as well only as a man would do who wore boots smaller than his feet. There can be no expansion of the foot whatever when his weight is thrown upon it, and he is consequently compelled to limp, and when he does move, to go in the most cramped and stiff manner possible.

The *cause* may be either the fault of the blacksmith, who neglects to rasp the hoof properly, or to trim the heels; but by far the greater number of cases are produced by keeping them on plank floors, and paying no attention to moistening the feet. The hoof begins to grow thick, becomes perfectly dry, and to have a white rim visible around its top, next to the hair of the leg, by which it is often concealed from view.

Remedy.—Rasp the "quarters" of the hoof until, upon pressure being made from side to side, it is discovered the heels can be easily moved towards each other. In fact, rasp the hoof until the unnatural pressure of the thickened crust is removed. Trim the heels low, and if the horse is to be used, have the shoes slightly bent downwards at the back part, so as to allow the heels to expand as much as they can. At each successive shoeing, have the shoe made a little wider at the heels, until the hoof is thus gradually brought into its natural shape, viz: about as wide at the heels as it is at the toe.

The dryness of hoof may be overcome by having the horses' feet "stopped" every night with cow-dung, and using a little oil on the outside of the hoof occasionally. A less troublesome and better plan, we think, is to remove a portion of the dirt floor of a stall, which should be re-filled with clay, to which cow-dung and salt may be added, and after it is well chopped up with a hoe, add water in sufficient quantity to make the whole floor into a consistent paste. The horse should be kept in this stall during the day, and at night (for the sake of cleanliness) be removed to a dry stall.

The Farmer and Gardener.

We are indebted to the Farmer and Gardener, an excellent monthly, published in Philadelphia, for the very interesting article written for that paper by Professor E. Pugh, on "Poisoning Land," for which credit was omitted inadvertently in printing the article for this number of our paper. We are also indebted to that paper for a very good article on the Physical Condition of the Soil, by Wm. Bright, Logan Nursery, Philadelphia.

Errata.

In our January number, two provoking errors occur in the article of Mr. Ruffin on "Slavery and Free Labour," &c., which the reader is requested to correct. For "rates of improvement," occurring near the middle of the second column, page 8, read *ratio of imprisonment*, and 18 lines above—whole number of "[negro]" criminals, &c., strike out the word negro.

United States Agricultural Society.

The *Eighth Annual Meeting* of this society was advertised to be held at the "Smithsonian Institute" in Washington, D. C., on the second Wednesday in January, 1860, for the election of officers and the transaction of business.

We regret that we received its announcement *too late for our January number.* Especially as it was intended to have public discussions on various agricultural topics—among them "the establishment of a Department of Agriculture;" Physical Geography in its relation to Agriculture; The Steam Plow; Under Draining, &c., &c.

As soon as we learn the particulars of this meeting, we will, with pleasure, lay them before our readers.

Below, our readers will see the views of a Massachusetts Editor, as to the course we should pursue, to develop our resources, and secure the prosperity of our section of the Union. He is undoubtedly right in his opinions, *except as they relate to the character of our laborers.*

We believe that it is to our system of negro slavery *alone* that we owe our entire exemption from all those "*isms*" which at present so strongly war against all the dictates of Christianity, common sense, and good citizenship, in those parts of the United States, where the "laboring population is free and intelligent!!" albeit they are in so many instances such slaves to factious prejudice and evil passions.

What a Massachusetts Editor Thinks.—The people of Virginia and other sections of the South, in their ill feeling toward the free States, talk of establishing manufactories and direct commercial communication with Europe for themselves. If such should be the effect of the late foray—as unfortunately it will not be—there would great good come out of evil. The dissolution needed by the South is not of the political union of the States, but one that shall give them greater independence in their industry. Let them manufacture cloth and shoes and hats; let the cotton of the South be worked into fabrics where it grows, the iron be laid in rails over the soil beneath which it now rests, the gold of the Carolinas and Georgia be melted and wrought in those States, the wood of Texas be turned into the new built factories of that vigorous commonwealth, while the timber of Florida and Virginia is made into ships to sail from and to their ports, if so the South will. It is such a diversity of pursuits that is needed to make the Southern section of this country the most prosperous land in the world, and such it would be if its laboring population were free and intelligent.—*Newburyport Herald.*

Trade of New England with the South.

The Boston *Post* contains a long and able article showing the extent of the trade between New England and the South, from which we make the following extract:

The aggregate value of all the merchandise sold to the South annually we estimate at some $60,000,000. The basis of the estimate is, first, the estimated amount of boots and shoes sold which intelligent merchants place at from $20,000,000 to $30,000,000, including a limited amount that are manufactured with us and sold in New York. In the next place we know from merchants in the trade, that the amount of dry goods sold South yearly is many millions of dollars, and that the amount is second only to that of the sales of boots and shoes. In the third place, we learn from careful inquiry, and from the best sources, that the fish of various kinds sold, realize $3,000,000 or in that neighborhood. Upwards of $1,000,000 is received for furniture sold in the South each year. The Southern States are a much better market than the Western for this article. It is true since the establishment of branch houses in New York, Philadelphia and other cities, many of the goods manufactured in New England have reached the South through those houses; but still the commerce of New England with the South, and this particular section of the country receives the main advantage of that commerce. And what shall we say of New England ship building, that is so generally sustained by Southern wants? What shall we say of that large ocean fleet that by being the common carriers of the South have brought so large an amount of money into the pockets of our merchants? We will not undertake to estimate the value of these interests, supported directly by the South. If many persons have not become very rich by them, a very

large number have either found themselves well-to-do, or else have gained a living.

Now, what does New England buy of the South to keep her cotton and woollen mills in operation—to supply her lack of corn and flour, to furnish her with sugar, rice, tobacco, lumber, etc? Boston also received from the slave States in 1859 cotton valued at $22,000 000; wool worth $1,000,000; hides valued at $1,000,000; lumber $1,000,000, flour $2,500,000; corn $1,200,000; rice $500,000; tobacco estimated at $2,000,000. We thus have $31,200,000 in value, only considering eight articles of consumption. Nor have we reckoned the large amounts of portions or all of these articles which arrive at Providence, New Haven, Hartford, Portland and other places. Nor have we reckoned the value of other articles that arrive at Boston, very considerable though it be, such as molasses, naval stores, beef, pork, lard, and other animal produce; hemp; early vegetables; oysters and other shell fish; game, peaches, etc. May we not estimate then, with good reason, that New England buys of the South her raw materials and other products to the amount of some $50,000,000 annually? In 1858, about one third of all the flour sold in Boston was received from the commercial ports of the Southern States, and in the same year seven-twelfths of all the corn sold in this city, was received direct from the States of Delaware, Maryland and Virginia. The value of the product of sugar and molasses, principally produced in Louisiana in 1858, was about $33,000,000, and though but a small portion of it came to New England, nearly one-half the crop is consumed in the Northern States, reaching the points of consumption by the Mississippi river.

For the Southern Planter.

Loudoun County Agricultural Society.

MIDDLEBURG, Dec. 17, 1859.

Mr. Editor,—In your notice of the Agricultural Societies of the State, in the December No. of the Planter, you omitted one which I think deserves notice—the "Loudoun County Agricultural Society."

I enclose a paper containing a detailed report of its last exhibition, from which you will ascertain that this Society is in a very flourishing condition. We have at our exhibitions some of the best stock in the United States. The exhibition of horses, by far, the best in the State. The other departments very good.

We own a lot of ten acres—well arranged and substantially improved—nearly paid for. We expect at our next fair to be entirely free from debt, and to distribute a much larger amount in premiums. This year we gave upwards of five hundred dollars in premiums.

The officers of the Society are, Col. Norborne Berkeley, President; Thomas Edwards, Esqr., Secretary and Treasurer.

The Colt Club we call the "Upperville Union Club," for improving the breed of horses; and as its name imports, comprises several counties: Loudoun, Clarke, Warren and Fauquier. The latter county, perhaps, contributing a majority of members.

The officers are, Col. Norborne Berkeley, President; Dr. Joseph G. Gray, Vice President; Alexander Grayson, Secretary and Treasurer.

J. Z. G. H.

Our correspondent will pardon us for publishing this note, which so well expresses the information as to the Society therein mentioned, inadverdently omitted in the article to which he alludes, in our December No.—EDITOR.

Lectures on Agriculture,

To be given during the Agricultural Convention, at New Haven, February, 1860.

Agricultural Chemistry; Prof. S. W. Johnson.

LECTURE 1. Composition of the Plant. The Organic Elements—Oxygen, Nitrogen, Hydrogen, and Carbon. Lec. 2. Proximate Organic Principles of the Plant—Cellulose, Starch, Dextrine, Sugar, Gluten, Albumen, Casein, Vegetable Oils and Acids. Lec. 3. Atmospheric food of Plants—Water, Carbonic Acid, Ammonia and Nitric Acid—their sources and supply. Lec. 4. The Ash of Plants—Potash, Soda, Lime, Magnesia, Oxyd of Iron, Oxyd of Manganese, Chlorine, Sulphur, Phosphorus.

Etomology; Dr. Asa Fitch.

LEC. 1. Great losses sustained from depredating insects; their classification, structure, metamorphoses, habits, and means of destruction. Lec. 2. Insects injurious to grain crops, with a particular account of the wheat midge and Hessian fly. Lec. 3. Insects injurious to fruit trees, with a particular account of the Curculio and the apple tree borer.

Vegetable Physiology; Daniel C. Eaton, Esq.

LEC. 1. The vegetable cell—its form, size, structure, contents, origin, and mode of growth. Lec. 2. The seed, root, and stem. Nature and growth of seeds. Structure of roots. General structure and minute anatomy of stems. Lec. 3. Arrangement of leaves; their parts, forms, structure, and economy. Food of plants. Relations of the vegetable kingdom. Lec. 4. Flowers and Fruits. Arrangement of Flowers; their parts and offices of parts; development of fruit.

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SECOND WEEK.—PROMOLGY, &c.

Pear Culture; Hon. Marshall P. Wilder.

American Pomology; the best method of promoting it; with practical suggestions on the cultivation of the pear.

Grapes; Dr. C. W. Grant.

LEC. 1. Preparation of the soil, and propagation of the vine. Lec. 2. Culture of native varieties, with account of different varieties and

their qualities. Lec. 3. Foreign varieties; culture and treatment.

Berries; R. G. Pardee, Esq.

Lec. 1. Strawberries, Raspberries, and Blackberries; soil, cultivation, varieties. Lec. 2. Currants, Gooseberries, Cranberries and Whortleberries; soil, cultivation, varieties.

Fruit Trees; R. G. Pardee, Esq.

Lec. 1. Propagation and treatment of Fruit Trees in the Nursery. Lec. 2. Transplanting and management of Trees in the orchard and garden.

Fruit; Lewis F. Allen, Esq.

Lec. 1 and 2. The Apple. Lec. 3. Uses of Fruits economically considered; profits as farm crops; their consumption as food for man; as food for stock; value for exportation.

Arbouriculture; Geo. B. Emerson, Esq.

Lec. 1. Character of various Forest Trees, as found growing in the forests of Europe and America. Value for various purposes. Forest culture. Lec. 2 Shade and Ornamental Trees; modes of cultivation.

Agricultural Chemistry, continued; Prof. S. W. Johnson.

Lec. 5. The soil; its chemical and physical character. Lec. 6. The mechanical improvement of the soil by tillage, fallow, and amendments. Lec. 7. The Chemical and Mechanical improvement of the soil by manure. Lec. 8. The conversion of Vegetable into Animal produce. The Chemistry and Physiology of Feeding.

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THIRD WEEK.—AGRICULTURE PROPER.

Drainage; Hon. Henry F. French.

Lec. 1. The sources of moisture. What lands require drainage. Drainage more necessary in America than in England. Lec. 2. Various methods of Drainage. Direction, distance, depth and arrangement of Drains. Lec. 3. Effects of Drainage. Drainage promotes pulverization, warmth, absorption of fertilizing substances from the air. Lec. 4. Over-drainage; obstruction of drains; remedies; effects of drainage on streams and rivers.

Grasses; John Stanton Gould, Esq.

Lec. 1. Amount and value of the grass crop. The great increase practicable; destruction of the Grasses; obstacles to profitable culture. Lec. 2. Classification and description of Grasses. Lec. 3. On the principles of laying down and seeding meadows and pastures. Lec. 4. On irrigation and drainage of meadows.

Cereals; Joseph Harris, Esq.

On the cultivation of Wheat and Indian Corn.

Root Crops; T. S. Gould, Esq.

The field Turnip, Ruta Baga, Beet, Carrot, Parsnip; varieties, soil, culture, composition, uses. Root culture essential to high farming. Preservation and feeding of roots.

Tobacco and Hops; Prof. Wm. H. Brewer.

Lec. 1. Range of Cultivation; preparation of soil; care of plants; gathering and curing; advantages and disadvantages of cultivation. Lec. 2. Hops, ditto.

Sandy Soils; Levi Bartlett, Esq.

On the cultivation of Winter Wheat, and the management of sandy and other light soils.

English Agriculture; Luther H. Tucker, Esq.

Lec. 1. Causes of its pre-eminence. An outline of the chief improvements accomplished. Lec. 2. Examples of English Farming; High Farming; visits to great Dairy establishments; remarkable results of Irrigation. Lec. 3. The Agricultural Shows of '59. Improvement of Stock. Lessons of English Agriculture.

German Agriculture; Dr. Evan Pugh.

President Pennsylvania Agricultural Society.

Agricultural Statistics and Education; Prof. Jno. A. Porter.

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FOURTH WEEK.—DOMESTIC ANIMALS.

Cattle; Cassius M. Clay, Esq.

Lec. 1. On the five leading breeds, with notice of some other varieties. Lec. 2. Breeding as an Art.

Stock Breeding in the United States; Lewis F. Allen, Esq.

Lec. 1. Cattle, Sheep, Pigs; their various breeds; adaptation to climate, soil and purpose. Lec. 2. Best methods of breeding, physiologically considered. Present condition of stock breeding and rearing in the United States, as compared with some portions of Europe. Lec. 3. Poultry, economically and æsthetically considered; varieties, as adapted to climate and locality; utility and markets.

The Dairy; Charles L. Flint, Esq.

Lec. 1. Breeds and breeding of Stock with special reference to the Dairy. Lec. 2. The management and economy of the Dairy.

Horses; Sanford Howard, Esq.

Characteristics of Breeds, and Breeding for special purposes.

Breaking and Training Horses; Dr. Daniel F. Gulliver.

On the methods of subduing and educating the Horse. The Baucher and Rarey systems. Great enhancement of intrinsic and market value of Horses by these means.

Sheep; T. S. Gold, Esq.

Lec. 1. History and description of the various breeds; localities and uses to which they are adapted. Lec. 2. Winter, Spring and Su m

mer management of Sheep. Diseases Adaptation of our country to Sheep raising. Comparative advantages of Sheep husbandry. Care and sale of wool.

Pisciculture; John C. Comstock, Esq.

LEC. 1. Decrease in natural supply of Fish. Reasons. Application of artificial fish breeding to renewing supply. History of Pisciculture. Lec. 2. Raising Fish in private waters. Practical questions. Accounts of experiments in Fish breeding in this country. Importance of Fish breeding as a branch of agriculture. Fish as an article of diet, &c., &c.

Agricultural Associations; Mason C. Weld, Esq.

Organization and uses of Agricultural Societies and Farmers' Clubs.

Rural Economy; Donald G. Mitchell, Esq.

ARRANGEMENTS.

An average of three Lectures per day will be given from February 1st to Februrary 25th, inclusive, making sixty-six lectures in all. For the accommodation of persons desiring to spend Sunday at home, there will be no lecture Saturday afternoon or Monday forenoon. Each lecture will be followed by questions, and a discussion. Persons attending the lectures will have the liberty of introducing other topics besides those of the above list, and thus eliciting information adapted to their own case. Among other distinguished gentlemen, besides the lecturers, who will attend, John Johnston, Esq., of Geneva, the pioneer in American Tile Drainage, will be present during the Third week of the Course, to give any information desired as to his own experience in Drainage. This Course of Lectures will be made intelligible and useful to beginners in Agriculture, as well as to experienced farmers. Applications for Tickets have already been received from nearly half the States of the Union Early application is advisable. Board at very reasonable prices can be engaged beforehand for early applicants. Tickets for the whole Course, $10 00; for any single week, $3 00. Single lectures, 25 cents. For further information, address

PROF. JOHN A. PORTER,
Mew Haren, Conn.

The Year Book of the Farm and Garden, for 1860. Beautifully illustrated. Price 25 cents. A. M. Spangler, 633 Market St., Philad'a.

This is another valuable addition to the library of the farmer, gardener, and house-keeper, and everybody who is either the one or the other, ought to have it.

We know of no publications, offered at a small price, which contain so much information, valuable to the persons we have mentioned, and the "rest of mankind," as this "Year Book," now offered by Mr. Spangler, and the "Annual Register," published for several years by L. Tucker & Son, Albany, N. Y.

These books contain something of everything useful, and we know they *must* give satisfaction to every sensible man, who is fortunate enough to possess one.

The "*Valley Farmer*" and "*Country Gentleman,*"

Two of our most highly prized *Exchanges*—make their appearance this year in new dresses. We congratulate the editors of these papers, as cordially on their good *taste* in "getting up" the *outside* of their respective sheets, as we commend and admire the good sense, dignity and ability with which they have ever filled up the *inside.* Success to both of them.

The American Stock Journal.

We are glad to see that D. C. Lindsley, the competent editor of this paper, who is already well and favorably known to the stock breeders of the United States, has secured the services of Dr. George H. Dadd, (editor of the Veterinary Journal,) to conduct the veterinary department of the paper.

The Journal of the New York State Agricultural Society

Is received, for which we return our thanks to B. P. Johnson, Esq., the able Secretary of the Society.

The Ohio Farmer

Comes out for 1860 in a new dress, and with a promising "bill of fare" for all those who are desirous of becoming participants in an agricultural "Entertainment" of a literay and practical character. We append his terms:

REGULAR TERMS IN ADVANCE.

Single copy, one year,	$2 00
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THO. BROWN, *Cleveland. O.*

The Horticulturist,

Published by the well-known house of C. M. Saxton & Co., we are glad to welcome to our list of exchanges.

This is an able and well sustained paper. Price $2 per annum. Address C. M. Saxton, Barker & Co., 25 Park Row, New York.

We commend the "*Advice to Young Farmers*," by L. M., to our readers. We hope we shall have the pleasure of hearing from him very often. Our columns will always give him a place, and if they are crowded at any time, we will gladly *make room* for any article he may be kind enough to send us.

We return our thanks to CHARLES L. FLINT, Esq., the author of that capital work on Dairy Farming, and Secretary of the State Board of Agriculture of Massachusetts, for a copy of the *Circular* issued by them, offering aid to farmers in establishing Farmers' Clubs.

The Labour and Profits of a Dairy Farm.

In the previous chapter we endeavoured to give a fair idea of the amount of land, buildings and labour which would be required to supply a herd of forty milch cows with food and shelter, together with the labour necessary for their care and management. We have now to deal with the indoor work, incident to the changing of the raw products, into the manufactured article fit for merchandize.

What amount of labour will be necessary for the manufacture of milk into cheese and butter? Much will depend upon the conveniences and fixtures furnished by the proprietor; and also whether the proprietor himself can superintend the whole manufacturing process, or has to entrust it to an experienced cheesemaker, either male or female. We believe that with the vats, boilers, milk and whey conductors, washing and cleansing apparatus, hot and cold water pipes, cheese presses, shelves and tables, all arranged with a design to economise work, that one smart experienced woman with the assistance of another to be had at the usual rate of wages, would be able to do all the manufacturing. But where the dairy business forms only part of the business of the farm, much of the work must be done by a man. The labour of the manufacture would consist, therefore, of a man's time for two-thirds of the year, and of a woman for the same time. Their whole time would probably be occupied in the business of the farm, but only this proportion should be charged to the cost of manufacture.

As to the plan of milk rooms, cheese rooms, and the fixtures, with the best methods of manufacturing either cheese or butter, they do not belong to the matter now in hand, which is only to inquire into the cost and profit of a dairy of forty cows in this State.

What should be the average produce of the forty head of cows for the season, and what amount of cheese should be yielded from their milk; and what would be their other products?

In starting a dairy it will not be found possible, the first year, to have all the cows come in at just such seasons as may be most desirable; but after that, by a little attention and proper management, the calving of the whole lot may be regulated so that all may be in full flow of milk by the 15th of May; and from that time to the first of August, the whole forty should average twelve quarts each per day; which, for the 77 days would be 9,240 gallons. The usual yield of cheese per gallon, for this season of the year according to the records furnished by the best Herkimer county dairyman, ranges from a pound to one pound two ounces, the largest yield of cheese being in the spring and summer months. According to this ratio, therefore, there should be made 10,395 pounds of cheese in the first 77 days. For the next term of three months the average yield of each cow will decrease at least one-fourth, leaving it at the rate of nine quarts per day. This would afford 8,100 gallons of milk for the whole of this second term, giving at the rate of one pound one ounce of cheese per gallon, or a total of 8,606 pounds of cheese. This would bring the cheese-making season to an end about the first of November, from which time until the cows are dried off, the manufacture of butter would be probably most profitable, as at that season the milk is richer in oil, affords less curd, and fresh butter commands the highest price.

The whole product of cheese for the year would be as follows:

77 days, 9,240 gallons of milk at 18 oz. per gallon,	10,395
90 days, 3,100 gallons of milk at 17 oz. per gallon,	8,606
Total cheese made from May 15 to November 1,	19,001

From November 1 to March 1, the average produce of milk per day may be calculated at four quarts from each cow; some of course will yield more; but if from a herd of 40 that amount is obtained from the first of November till the first of March, they may be considered a good lot, and well taken care of. The total amount of milk for this third term will be 19,200 quarts, or 38,400 pounds. If we take the ratio of milk to butter as given by Mr. Thomas Hoskins in the Farmer for April, or one pound of butter from 25 pounds of milk, we would have 1,536 pounds of butter. But milk at that season should give a greater proportion of butter, and with feed in kind and quantity, suited to promote the production of butter, it might be that a pound of butter would be produced by every 20 pounds of milk, which would make a difference of 20 per cent.

For the third term, from March 1st to the middle of May, the whole produce must be considered as belonging to the calves, and to be in part repaid by their sale.

The whole yield of the 40 head, in butter and cheese, would be as follows:

19,000 pounds of cheese at 9 cents,	$1,710 00
1,920 pounds of butter at 18 cents,	345 60
	$2,055 60

This would make an average of $56.14 per cow, or 475 pounds of cheese, and 48 pounds of butter from each cow per year. This is not an extraordinary yield. A. L. Fish, of Herkimer, N. Y., reported to the New Yord State Society, that in 1844, the produee of his dairy was at the rate of 700 pounds of cheese per cow, and in 1845, it was as high as 775 pounds of cheese from each cow of his herd.

Mr. J. C. Morton gives 500 pounds as the annual yield of a cow in the celebrated cheese district of Gloucestershire, England. In the Ayrshire districts the average is something above this, whilst in some places of Great Britain the average does not reach much over 350 pounds per annum. This difference arises from local systems of manufacture, feeding and other causes.

Cheese and butter, however, are not all that the dairy yields. There are, besides the whey, the skim-milk, and the buttermilk, which ought all to be used in the manufacture of pork of the best and sweetest kind sent to market. This offal of the dairy is not to be relied upon alone; it too requires management, and to be mixed with the offal of grain, and a certain proportion of grain itself. No dairy should be without a piggery attached to it. The number of hogs which may be kept by a dairy will vary according to the fancy of the proprietor for the small quick maturing breeds, such as the Improved Essex, the Suffolk or the Chinese, or for the large breeds, such as the Leicester, the Byfield or the Berkshire. The number of pigs which may be kept will also vary with the season. In the summer there is a demand for lean light young pork, or pigs that will dress from 100 to 150 pounds, by the butchers of the large cities. It should be a point with the dairyman to to thin out his young stock, as they increase in size, by fitting those most suitable for the butcher. This leaves the store hogs a larger share of food to each, as they increase in size. It is plain therefore, that the dairyman may begin in the spring with some fifty young suckers from four to eight weeks old, and thin them down with profit to himself, to fifteen or twenty. For this kind of feeding we incline to favour the Suffolk or Essex breeds, or high grades of them. Of the large breeds, one hog of three or four months old to two cows will be found almost as many as the offal of such a dairy will sustain.

For the food of these hogs, there should be calculated that at least 75 per cent will be the quantity of the offal which will be available, and which, during the time from May to November, should be equal to 80 gallons per day. This slop, with an average of four quarts of mill feed to each, counting them at 20 head, should give a fair growth of pork that will make a considerable addition to the receipts of the dairy, as will be seen by the following estimate, which only includes the store hogs, and does not make any allowance for the pig-pork sold during the summer and fall seasons:

20 six weeks pigs, worth on the 15th May $1.50,	$30 00
Use of a five acre clover pasture for the season,	15 00
4 quarts of feed per day to each hog, for 280 days, being 7 tons at $12 per ton,	84 00

8 quarts of marketable corn to each hog for 50 days, being nearly an average of six bushels to each hog, given when put up for fattening, and worth 35 cents per bushel,	48 00
Total cost of 20 hogs besides the dairy slop,	$177 00

We do not believe it would be unreasonable to calculate that each of these hogs, after being kept in this manner for nine months, should weigh 255 pounds when killed and dressed; and if they are sold at five cents per pound, each one would bring $12.50, or for the whole $250, leaving for labour and for the whole offal of the dairy $73, or a profit on each hog of over $3.50. We consider, however, that where either the Essex or the Suffolk breeds are kept, or high grades of either of these, the same amount of feed and care would enable the dairyman to keep thirty instead of twenty, and that instead of a profit of only $73, he would get from his hog-pen, if rightly managed, $200 for the offal of the dairy. Mr. J. S. Tibbits of Livonia, has stated to us that he has raised at the rate of two pigs to each cow, following a method somewhat similar to the above, and he had most of his store hogs reach 300 pounds within the time specified. He also stated that the calculation with regard to his hogs, when he was in the dairy business, was, that they should pay for the labour of making the cheese.

We come now to the subject of estimating the whole cost of the conduct of a dairy of 40 cows, and to a comparison of that cost with the estimated income.

The cost of buildings to accommodate the cattle, and the cheese and milk rooms, including horse powers, cutting machines, boilers, milk vats, presses, and all the apparatus and fixtures necessary for economical feeding, and the most perfect manufacture of cheese and butter, should not cost over $800, and the interest on this for wear and tear and use of capital, would probably be 12 per cent., making an annual average rent of $96 to be charged to the dairy. Mr. Paris Barber, of Homer, New York, erected a barn for his 50 cows, a cheese room and milk room, with all the requisite apparatus, for $582.92, as reported to the New York Society in 1851. Mr. Moses Eames, of Jefferson county, in the same year, gave the plan and cost of a very extensive cheese house, with copper boilers, caldrons, vats of tin, and all the necessary fixtures, which amounted to but $432. It will thus be seen that our estimate will certainly cover the whole cost, and is within reasonable bounds.

The following table will give a recapitulation of the money or market value of the various crops grown for the use of the dairy, the labour incident to the work outside and inside, and of the returns which the various productions will yield.

Interest and wear of buildings,		$96 60
Summer feed:		
40 acres of pasture, at $5 per acre,	$200 00	
Cultivation of 3 acres of sorghum or millet, at $6 per acre,	18 00	
Cultivation of 5 acres of green rye for spring feed, at $3 per acre,	15 00	
Value of meadow pasture in the fall with pumpkins and other feed,	100 00	
One ton of mill feed,	12 00	
		345 00
Winter feed:		
50 tons of hay, at $6 per ton,	$300 00	
40 tons of corn stalks, at $4,	160 00	
443 bushels of corn at 35 cts.,	155 05	
10 tons of straw, a $3	80 00	
		645 05
Total money value of food required during the year for 40 head or cows, being at the rate of $25 per head,		$1,086 05
Labor:		
The labor incident to feeding and outside work is equal to 444 days of one man at 75 cents per day,	$333 00	
240 days of one horse, at cost, 30 cents,	72 00	
Labor in cheese room, half a man's time, for one year, at 10s. per day,	225 00	
Time of one woman at $5 per month, and board, the same,	120 00	
		750 00
Total money value cost of carrying on a dairy of 40 head of cows,		$1,836 05

Against this estimate of the expense, we have the following as the estimated income:

The cheese and butter sold as per rates above given,	$2,055 60
The profit on the amount of hogs sold,	73 00
30 calves fed during the time between the 1st of March, and the commencement of cheese-making, principally, at $3 per head,	90 00
Money value of three hundred loads of manure made by the cows and hogs, at 50 cents,	150 00
Total value of products,	$2,363 60
Balance, the actual clear profit after a fair market value has been allowed on every article consumed,	$527 55

In placing these statements before our readers, it has been for the purpose of showing what are the real profits of the dairy business. There is no single item in the above estimates, which has not been carefully compared with the printed or verbal reports of practical men of our own State, or of the great dairy districts of New York, or of Great Britain, so far as was possible.

We were led into it, by meeting with a practical friend, who, with a farm of four hundred acres, was about to "rush" into the dairy business for the first time, and wanted to know how much of his farm we thought it would take to keep the number of cows he had then on hand, and whether we thought it "would pay." In passing through the agricultural districts we come in contact with many such questions, and much practice that is adapted to the West alone, and they can find expression and answer usefully only in the form we have above given.

It is too much the practice of many farmers to jump from one department of their business to another, without considering whether they have strength to carry a somewhat encumbered body over the fence or not. The above brief estimates of land, of labor, of capital and profits involved in the management of a dairy farm, are therefore submitted with the hope that they will be of use, and also that they will draw out observations and experience from those who are interested in this complicated division of farm labor. Of the care, skill, constant attention, and exercise of judgment requisite to make a first rate cheese, it is impossible to give an adequate idea; that must be learned by actual practice and observation, with the aid and example of competent instructors.—*Michigan Farmer.*

From the Columbus Times.

A Suggestion to Planters.

I have been long convinced that every consideration of benefit and advantage to owners and managers, recommended a change in the employment of overseers—making the year to commence and end on the first of October, instead of the first of January. All that remains of the year's work on the first of October, are cotton picking and corn gathering. A manager taking charge at that time, would prosecute them with more energy and care, than one who expected to leave at the end of the year. He would hurry the cotton picking in order to have all the time possible to prepare for next year's crop. He would gather and carefully house the corn, with an eye to its use by himself. He would put down the crops of small grain with more care, expecting himself to reap them. He would more carefully fatten the pork-hogs, expecting himself to use the bacon. The plough and grazing stock would be taken in charge at the commencement of winter, and he would feel, in taking care of them, more interest and responsibility, than if he had to carry them half through it and then turn them over to a successor.

Between the first of October and first of January there is much time that cannot be devoted to cotton picking, this he would feel more interest in appropriating to repairs, ditching, &c., preparatory to the next crop, than would one who expected to leave at the end of the year. Again, thus taking charge on the first of October, his means of ascertaining the capacities of the plantation and the force upon it, would be far superior to what they would be under the present plan.

But I forbear to extend this article, believing that I have said enough to call the attention of the planting community to it. It is easy enough of accomplishment. Will not the *Southern Cultivator*, the *Soil of the South*, the agriculturalists soon to assemble at Atalanta, and the Cotton Planter's Convention of Houston county, give these suggestions such consideration as their importance seem to demand, in the opinion of, at least, one PLANTER.

Training Oxen.

A word on training oxen. I have found that by far the best time to train steers is when they are calves, say the first winter. Oxen that are trained when quite young, are much more pliable and obedient, and this adds much to their value. Steers that run until they are three or four years old, are dangerous animals to encounter. They are always running away with the cart or sled whenever there is a chance for them, and often serious injury is the result. I would not recommend working steers hard while young, as it prevents their growth; there is a difference between working them and merely training them. I have observed that very little attention is paid by our farmers to train their steers to back, but as

they become able to draw a considerable load forward, they are often unmercifully beaten on the head and face, because they will not back a cart or sled with as large a load as they can draw forward, forgetting that much pains has been taken to teach them to draw forward, but none to teach them to draw backward. To remedy the occasion of this thumping, as soon as I have taught my steers to be handy, as it is called, and to draw forward, I place them on a cart where the land is a little descending; in this situation they will soon learn to back it. Then I place them on level land, and exercise them. Then I teach them to back a cart up land that is a little rising, the cart having no load in it, as yet. When I have taught them to stand up in the tongue as they ought, and back an empty cart, I next either put a small load in the cart, or take them to where the land rises faster, which answers the same purpose; thus in a few days they can be taught to back well, and know how to do it, which, by a little use afterward, they never forget. This may appear of little consequence to some, but when it is remembered how frequently we want to back a load, when we are at work with the cattle, and how convenient it is to have our cattle back well, why should we not teach them for the time when we want them thus to lay out their strength? Besides, it often saves blows and vexations, which is considerable when one is in a hurry. I never consider a pair of oxen well broke until they will back well with ease any reasonable load, and I would give a very considerable more for a yoke thus trained.—CHARLES A. HUBBARD, *in New England Farmer.*

Hog Pasture.

It being generally understood that hogs live by "special providence" until it is time to fat them, there is little attention paid to the most economical way of growing them up. Certain it is, that a good, easy-keeping variety will make commendable progress on grass, and it is worthy of investigation whether hog-raising may not be profitably carried on in any section of country by the aid of good pastures and other appliances. It may be safe to calculate that a good-sized thrifty pig will gain in six months, on grass, a hundred pounds or more. If an acre of grass would keep three hogs, and add a hundred pounds to the weight of each, that would be $12 for the acre of pasture, reckoning the three hundred pounds gain at four cents a pound, live weight.

The particular point which this pastoral letter is ambitious to inculcate is this: grass being a good thing and profitable to swine, attention should be paid to the furnishing of an abundance of it, and of the best quality, to these animals. Instead of being forced to bite twice at a short, dirty and battered spear of June grass by the road side before getting any off, imagine a clean and comely Suffolk in a fresh green pasture, just four inches high filling himself with evident relish. That looks like gain.

Don't Know Beans.

A correspondent of the Chicago Times relates the following joke at the expense of an agricultural paper:

I was in the cars going to the State Fair at Freeport some time ago, and unintentionally overheard a conversation. The parties to the conversation were a farmer from Lake county, and an agricultural correspondent. When near Nevada, the member of the "staff" was in the height of an animated explanation of how "we" had benefited the farming interest by having agents always travelling, reporting the prospects of crops, &c.; just at that moment a field of buckwheat in bloom attracted his attention.

"What a fine field of white beans that is," exclaimed the traveling editor.

"Beans!" said the farmer, "that is buckwheat."

"Oh! what a beautiful white grain it has; I must make a note of it, and write a letter from Freeport about it. Buckwheat like that is not to be found at the East! The specimens I have been accustomed to see produced a very dark flour."

"Why, of course; this buckwheat will produce a dark flour," rejoined the farmer, "what you saw was not the *grain*—that was the blossom!"

"Oh! Ah!" said the editor, who quickly closed his "notes on buckwheat," and shortly after went into the smoking car.—*Richmond Dispatch.*

For the Southern Planter.

Onward.

Strive like a man! though youth's morning be cheerless,
Though ill-boding clouds thy horizon o'erspread,
Stand thy ground! be patient, courageous, and fearless,
For all will come right—be a man! go ahead!

Yield not a moment to useless repining,
But press firmly on, in the battle of life,
Hope's star, though obscur'd now, will yet, brightly shining,
Illumine thy pathway—faint not in the strife.

Thy motto be DUTY, in GOD be thy strength;
No step backwards trace, and with honour
He'll crown
Thy brow, if thou quail not; thou shalt conquer at length,
Though poverty sting, and misfortune may frown.

I Love This Glowing Southern Clime.

BY FRANK MYRTLE.

I love this glowing Southern clime,
With skies so mildly bright;
Where reigns one constant sweet spring time,
So full of fond delight;
Where flowers are blooming all the year,
As beautifully fair
As if the floral queen had made
Her fragrant palace there.

I love the Southern songster's note,
The balmy zephyr's breath,
Where perfumed strains of music float
From out the forest's depth;
Where blithesome hearts are warm and true
As ever breathed a prayer,
And where enchanted pleasures woo
The soul to linger there.

I love the Southern twilight hour,
It breathes a holy spell,
While musing 'neath the orange bower,
Or in some fairy dell;
I love its starry heavens by night,
Its dewy moonlit eves,
Where Luna's silvery beams of light,
Gleam through the orange leaves.

You speak to me of happy homes
Far in the snowy North;
I know the heart where'er it roams,
Will love its native hearth;
But say, is not this Southern clime,
So beautifully fair,
More lovely in its sweet spring time
Than aught you cherish there?

[*Memphis Eagle and Enquirer.*

Go for the Right, whatever Betide.

BY W. M. MARTIN.

Though beauty entice you
With laughter and smiles,
And strive to ensnare you
With charms and with wiles;
Oh! pass them by lightly,
Their powers deride,
And go for the right,
Whatever betide.

Though wealth may allure you
With diamonds and gold,
The strength of your manhood
Must *never be sold;*
Bid riches avaunt ye,
With power and pride,
And go for the right
Whatever betide.

Though power oppose you
With strength and with might,
Oh! ne'er be disheartened,
Though hard be the fight;
Oh! never be conquered,
Nor e'er turn aside,
But go for the right
Whatever betide.

In archives of glory
Your name be enrolled,
In songs and in story
Your brave deeds be told,
Along with the heroes
Who fought and who died,
Who went for the right
What'er might betide.