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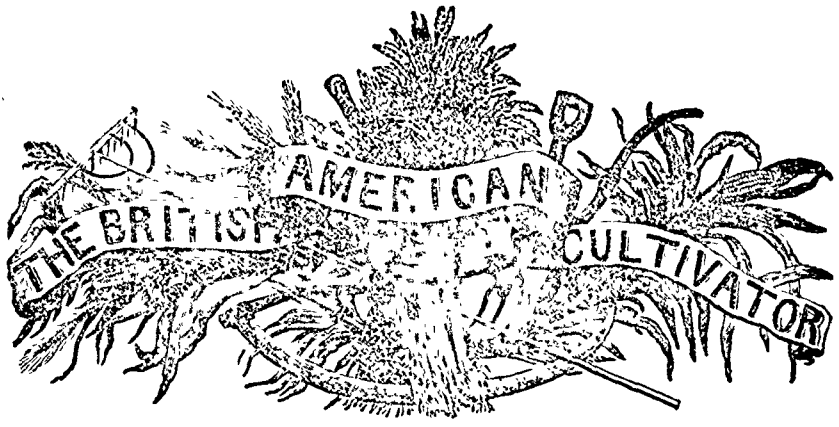

"Agriculture not only gives Riches to a Nation, but the only Riches she can call her own."

New Series. TORONTO, JULY, 1846. Vol. II. No. 7.

The following extracts from an Essay on Steam-power for Farmers, will doubtless be read with much interest. It is an entirely new subject for this journal, and probably but few of the Canadian farmers will be prepared to put it into practice. Steam could not be employed in any country to greater advantage than this, especially in those sections of country where water power is not available. Fuel, in a large portion of the country is abundant, and the price of labor is altogether out of character, with the relative value of agricultural produce,—hence the importance of some method being adopted to lessen the costs of production. There are many plans by which this may most effectually be done; and if the powerful influence of steam could be brought to bear, in the various branches of agricultural labour, with which it is susceptible of being profitably employed, there can scarcely be a doubt but that it would prove as powerful an agent in removing the fears that enshroud the minds of the farmers of this country, respecting the injurious influence of foreign competition, as some of the others which we shall, as opportunity presents to our view, submit to the public for their careful perusal. A very large share of the grain is thrashed and marketed in this country in the autumn months, the very period in which the plough, harrows, cultivators, grubbers, and other implements for cleaning land, can be most advantageously employed. The inconvenience and actual loss that the farmer sustains, who resides in the interior and back townships of the country, through being compelled to take his produce a long distance to market, in the months of September and October, or before the close of navigation, is another drawback upon his profits, which could be prevented through the influence of steam. Although we have as yet withheld our views on Railroads from the public, we have nevertheless, had a strong desire to discuss this question, in a plain practical manner that would be understood by the rural population of this country; and probably, at an early period, we shall have time to enter minutely into the effects and influences that would be produced upon the industrial interests, if this cheap and expeditious mode of transit was established in the best settled sections of the country. The geographical features of Canada, clearly points out both the necessity and adaptation of the country for Railroads; and it is the opinion of many persons, who are well acquainted with its vast resources, that the day is not very far distant, when steam power will be as extensively employed in conveying the produce of the back townships down to the frontier Lakes and Rivers, in proportion to the population, as is done in the United States or England. The agriculturists and manufacturers of Canada have not yet received much benefit from steam power, but it does not follow from this, that they should, as a matter of course, always remain in

ignorance, and be indifferent to their own interests. We will suppose, by way of illustration, that a farmer has an annual harvest, consisting of 100 acres of grain. This quantity, with an ordinary horse power threshing machine, could not be threshed under thirty days; and as we previously stated, a large share of this work would have to be done at a season when he could ill spare his team from the plough, but if an engine were employed instead of horse power, this trouble would be remedied, and the other purposes for which it could be converted, would, in many cases, return a larger profit than the farm itself. A ten horse power engine, and all the other apparatus complete for work, would not cost more than £300; and after the threshing and winnowing grain were completed, with a trifling extra expense, a few sets of circular saws could be set in motion for sawing firewood, veneering, &c., &c., and during at least six months of the year, it could be converted into a regular saw-mill, to be driven night and day, excepting Sundays. The slabs, and other refuse boards, and saw dust, together with a half a cord of well seasoned wood, would drive a ten horse power engine twenty-four hours. It is not generally known that saw dust, when first taken from the log will burn, almost equal to the best of wood The lumber business is a most profitable one, and will undoubtedly improve, inasmuch as the great scarcity of wood in the United States and Great Britain, will give an increasing demand for the best descriptions of seasoned lumber. Maple, birch, basswood, and butternut lumber is in great demand in Great Britain, and we see no good reason why the farmers of this country could not devote their energies during the winter months, in preparing for the British market, good clear lumber which would otherwise be allowed to go to waste. Where water power cannot be had, steam could at least be employed most profitably in this business.

Steam-Power for Farmers.

The extended application of the Steam-Engine, or other Impelling Power of the Threshing-Machine, to farm purposes: being extracts from an Essay on this subject, by ROBERT RITCHIE, F R. S. S. A &c., Civil Engineer Edinburgh. *Premium, Ten Sovereigns.*

The rapid advancement which Great Britain has made by the influence of her steam-power and machinery in manufactures, commerce, and navigation, has not been without a corresponding effect, though perhaps not to the same extent, in Agriculture. The proof of this is visible in the strenuous exertions made by agriculturists, of late years, to avail themselves of the use of machinery and improved implements of husbandry to economize labor. With the power of the steam-engine at command—although not now, perhaps, to the extent it may ultimately be made available—the British farmer has it in his power, at a moderate expense, on almost every farm, to lessen the labor of the barn, to extend its application to various useful purposes, and to place farm economics in a position of advancement which they have not hitherto attained. . .

By far the greater portion of the threshing-mills erected in the agricultural districts of Scotland are propelled by horse-power, but however convenient the use of the horse-walk and fixed threshing-machine was to the farmer, and justly considered, when introduced, as a great improvement in barn operations, and is yet esteemed so, still it has not been without its inconveniences, but when contrasted with the laborious employment of the flail, yet so generally in use throughout the world, its greater expedition and efficiency become apparent; and, when we consider that the use of the flail was better than the fee. of animals, we may be enabled to form some idea of the value of the horse-mill to farm purposes. Still, of later years, the intelligent farmer has hailed, with much satisfaction, the application of a new impelling power to the threshing-machine—a power whose dominion extends over every branch of the arts and manufactures of our country—which has given an impulse to modern nations, a command over the produce of every climate, and of which the most learned nations of antiquity never could surmise.

The application of steam-power to farm purposes seems by far the most important improvement which has been made, connected with Agriculture, in these times, and must, from its obvious advantages, soon supersede, every other power, except, perhaps, in a few isolated situations, where an ample water-power can be obtained, or where the smallness of the farms make it unimportant.

It is a good many years since steam-power was first applied to farms in Scotland, and, in the borders of England, in some few instances, from twenty to perhaps thirty years; but it is only within the last ten or fifteen years that it has become general, if it can even be said to be yet in general use.

The advantages of the steam-engine over wind, as the impelling power to the threshing-machine, appear to be, that it is always at command, and ready to perform the work required by day or night. Its advantages over water-power are, that neither heat can dry it up nor cold freeze it. Its advantages over horse-power are, that the motion is more regular and the work must be better done; for horses, in the threshing-mill, generally pull unequally, while the strain upon the limbs, in this severe work, proves injurious

to them. When the farmer, too, has always his horses fresh and ready for the field, he can do more work with fewer horses:* and if a pair or more can be saved, it is an important item to him.

One manifest advantage of steam, as the first mover of machinery, arises from its rapidity and certainty. If the farmer, therefore, can bring his grain on the shortest notice into market—if he can either thresh one stack or a dozen without stoppage, and so avail himself of any sudden rise in the market, without delaying or retarding the other operations of the farm—he possesses advantages invaluable, though no other were attained—advantages which no other means of threshing can give him. But steam-power likewise possesses that steadiness of action which cannot be obtained while employing the horse, and a much greater quantity of corn can be threshed in a day. The usual quantity of corn threshed by a six-horse steam-power, is at the rate of five quarters per hour, but four quarters may be taken as the general quantity to thresh easily; however, the quantity must vary according to the grain and straw. If the average of horse-power, as generally driven, be taken at thirty quarters per diem, the average of steam-power may be taken at fifty quarters, giving an advantage of twenty quarters in favor of steam-power, while the latter is kept up at no other expense, save fuel of the cheapest description—culm or dross is generally used—and, unlike the horse, when not working, *costs nothing!* hence, in every point of view, the use of steam-power on farms must prove advantageous.

The author of the excellent Treatise on Agriculture in the last edition of the *Encyclopædia Britannica*, seems to have fallen into an error when he says, "Wind and steam-power require too much expense for most farms, and that the use of steam must be confined for the most part to coal districts." From the recent date this article has been published, this opinion might not have been expected, if referring to the agricultural districts of Scotland. It may be presumed, therefore, the opinion has been inadvertently given, and if the author had entered more fully into the consideration of steam as a motive power, he would certainly not have classed it with wind-power. Indeed the rapid extension of steam-power to farms speaks volumes in its behalf. He would have found on investigation the immense benefit of the application of the steam-engine at a *very moderate expense to the farm.* A power which only requires to be understood to be more appreciated, and what almost every farmer who has used it has found to be one of the most advantageous improvements he has made on his farm-stead; and, while it increased his comfort, it was attended with no difficulty in the management, requiring no other attention than what any farm servant could easily give.

This power indeed, as applied to Agriculture, is yet in infancy; but with a prospect of gigantic manhood before it, it seems fitted in all probability, as it becomes more extended in its range of application, to change the entire face of the country, and to give the same impetus to Agriculture, which it has done to all branches of the Arts. No well-informed farmer should be insensible to the value and utility of the steam-engine, even limited as it now is as a moving power to the threshing-machine, and the adoption of this power by him, in most instances, in the best agricultural districts of Scotland and borders of England, evince beyond a doubt, that it, in his opinion, is the best and most advantageous power which has yet been applied, wherever there are not insuperable obstacles intervening; and it shows how readily the enterprising farmer avails himself of whatever improvement enables him to support competition and improve the capabilities of his farm.

In England, *fixed* threshing-machines have not been much used for farm-steads, hence stationary steam-power mills are ready to be met with. This may arise from a variety of causes without the value of these being overlooked by the various public-spirited agricultural associations scattered over the south. It cannot, however, be supposed, as its advantages become better known and understood, that the application of steam-power to farms, both in England and Ireland, will not in time become as common as in Scotland, where it has extended with amazing rapidity.* The threshing of grain with machines in England is generally carried on with portable mills wrought by horses; the threshing of grain being in some counties a regular branch of trade, the thresher removing his machine from farm to farm. Recently, steam-power has been strongly recommended at agricultural meetings (at the late show at Derby and other parts) for this purpose, and is now getting into use. The Disc. Engine Company of Birmingham have invented a very compact portable engine boiler, and threshing-machine, on a carriage. The whole machine provides for its being readily moved to different farms. Mr. A. Deans of Birmingham has also made, for a similar purpose, several forms of portable cylinder and piston engines, some with upright and some with horizontal cylinders. These engines are of different powers, from four to six horses', and the engine is placed on a neat iron carriage.

*The saving of a pair of horses to the farmer has been estimated at fully £100 per annum. Some farmers tell me, who have steam-power, that they can save a pair of horses out of four, on large farms.

*The Report on the Advantages of Steam as a Motive Power on Roads, by the House of Commons, is strangely coincident in the same reasoning.

The whole occupying very little room, requiring no chimney-stalk or brickwork, and is drawn from place to place by one or two horses It may be worked, he states, in the field or any where, without any fixing, for threshing corn cutting chaff, and other agricultural purposes Mr. Deans' inventions are clever, and many of them will be found useful. His portable steam-engine, with patent irrigator and fire-engine combined, adapted at the same time for driving threshing machines, pumping and draining, is deserving of the attention of the farmer. These applications are all very suitable for small farms, and dispense with the laborious employment of the flail. But the advantages of a fixed threshing-machine, and steady and cheap motive power, under the command of the farmer at all times, are so palpably apparent, that the only wonder can be how the farmer of land, to any reasonable extent, can do without it, as the want of it must place him under many disadvantages.

In the following remarks, respecting the subordinate purposes to which the prime or impelling power can be advantageously extended at the farm, the observations shall be confined to steam-power, although it will be easily understood that many additional uses to which this power can be applied may equally well suit any impelling agent of machinery in which there is a surplus power.

Before entering on this subject, it may be proper shortly to describe the form generally adopted, and give an example.*

In most of the new onsteads, where steam-power is used, the engine-house is generally an outshot from the barn. The boiler of the steam-engine is supplied from a well sunk at one side of the engine-room. This is the general plan with stationary farm-engines, and the back or surplus water from the boiler is returned to the well, the water being usually moderately heated before entering the boiler. But when well water cannot be obtained, which often happens in coal districts, a pipe is led to a cistern, from the nearest pond, from which the engine pumps the water directly into the boiler; or, the engine may be made to pump the water from the pond at a moderate distance; but this is just taking so much power from the engine itself. It is desirable always that the pump throws up an ample supply of water, when high-pressure engines are used, to prevent, from negligence, the risk of overheating and burning the sides of the boiler; of course, with condensing engines, a much more abundant supply of water is indispensably necessary; hence the non-condensing engine has been in many cases adopted, from the smaller quantity of water it requires. The engine, about seven horse-power, is on the non-condensing principle, with over-head crank; and the attachment of the power to the mill is extremely simple. The threshing-mill itself possesses every modern improvement. There are elevators to lift the grain to the hand-fanners, and elevators to repass the refuse through the mill; both of which are likewise worked by the engine-power-likewise a corn and bean bruiser, which admits of being attached or detached at pleasure. The steam-engine has been several years in use, and is most perfect of its kind, (it was made under my own direction,) and is capable of driving easily the threshing-machine and machinery connected with it, and also any additional machines which the farmer may find for his advantage to attach to it.

Another example is given, showing the connection of the steam-engine with a very complete set of farm-offices. This is entirely new, and would easily admit of subordinate machinery, if desired. This steam-engine is also of high-pressure or non-condensing, excellent of its class, and capable, as it ought to be, of doing more than the work required of it. The neatest arrangement, however, of the steam-engine house and boiler, is when these buildings form a part of the range itself of the farm-buildings, and not an outshot from it.

But, in truth, there is no end to the different plans which could be adopted by a skilful farm-architect or farm-engineer; and it may be said every farm-steading requires a separate design to suit the locality and wants of the farmer. There are no parts of Scotland where so many snug, compact farm-buildings can be seen as in the neighborhood of Edinburgh, the accommodation is ample, without being superfluous. So rapid, indeed, has been the extension of steam-power to farms in this vicinity, that from the fine elevations round Edinburgh, more than 100 steam-engine stalks or chimneys may be observed as the landmarks of the farm, and giving a peculiar feature to the landscape.

Although the subordinate purposes to which the impelling powers of the threshing-machine have as yet been extremely limited, yet it admits of no doubt, if under proper control, it may be applied to a variety of useful purposes to which it has not as yet been applied, beside out of threshing grain.—It is, therefore, of importance to consider the most simple and economical way in which the subordinate machines can be connected with the impelling power.

To the bruising of grain the power is commonly applied, and that most advantageously to the farmer. It has also been applied to chopping of straw, slicing of turnips, grinding of rape-cake, working a butter-churn, and driving circular saws; to these and perhaps many other purposes, the first power has already been at different forms applied. An inconvenience however, arises—although, perhaps of no very great importance—when the smaller machines are used, that they cannot be driven except when the threshing-mill shaft is set in motion as the axle or shaft of the steam-engine connects the first power with the mill, and, if worked with

*In the following remarks it is barely possible to be intelligible without sketches of the drawings which accompanied this Essay, except by those who are conversant with Scotch farm-steads; but as the paper and drawings will be subsequently published, reference can be made to the book.

belts, from a separate shaft; this latter shaft cannot be set in motion until the main engine-shaft, which connects the engine and threshing-machine, is going. When subordinate machines are used, worked by steam-power, they should be so contrived that the mills* may either be worked at the same time, or taken out of gear, and the machines worked or driven independently of the mill. This may be attended, perhaps, with more expense in the first erection, but it is more complete, and will, on most occasions when used, save a less of much steam.

Several examples might be adduced in explication of these points. At one of the first steam-powers, for a large farm, put up in West Lothian, the steam-engine can either drive the threshing-mill in connection with grinding-mills for meal and flour, or the latter can be used by themselves.—The machinery can be detached or taken out of gear at pleasure, and the whole is of the most perfect description. In such a case as this, the steam-power must be ample, which it is in the instance alluded to.

In another example of a simple description, in Mid-Lothian, an engine of eight-horse power, non-condensing, is regularly in use for a saw mill, while, at the same time, it is the motive-power of the threshing-machine. The force is communicated to the saw-mill by means of a large cogged wheel placed on the main shaft, between the fly-wheel and engine itself, driving two circular saws. The power is taken from, or given to, either threshing-machine or saw-mill at pleasure, by means of pinions or small wheels. Cut wood is manufactured here to a considerable extent, which shows how easily the steam-power can be advantageously employed, and to do also the work of the threshing-machine.

It would be tedious to go over the various skilful applications which have already been made use of by enterprising farmers in the agricultural counties round Edinburgh. The subject is *new*, and, perhaps, but in infancy. Of course a great deal remains to be done by skill and ingenuity before such plans are extensively adopted; but I have little doubt as the value of steam, as before stated, become fully known, as the *best* PROPELLING POWER FOR THE FARMER, endless may be the applications of it even to farm purposes.

One of the best examples I have yet met with of the acknowledged utility of subordinate machines worked or driven by the first power, is at a fine farm at East Lothian. The steam-engine which drives the threshing-machine is a neat condensing-engine, but only of six horse power. In addition to working elevators and dressing fanners connected with a complete threshing-machine, a shaft or axle—taking the power directly from the main-shaft of the mill—is led through the barn, which, by means of drums and belts, is made to work a corn-bruiser, barley-hummeller, and fanners, and likewise a pair of stones for a flour-mill, and a mill for grinding ripe-cake; and, by an additional shaft, a circular saw. The whole of the machines are so arranged that they can be driven alternately, and the flour stones are let off to a neighbouring miller, thus proving the economy of the arrangement. In addition to these machines, the spare steam from the boiler is made to heat a *drying-loft*, which is placed over the boiler-shed, on the floor of which small tin or iron pipes are laid, heated by steam from the boiler. These pipes are protected by a grating of wood, and the whole covered with hair-cloth. Dump grain is here dried with the greatest facility; and in wet seasons the drying-closet or room is found to be of great utility.

Indeed, the whole arrangement at the farm displays much skill and ingenuity; and we could not have a better example of a *small power* with which so many subordinate machines can be usefully employed without great trouble or expense.

I might give several more illustrations from *other farms* where great ingenuity has been displayed in economizing labor by machinery, but I think it unnecessary, as the one I have given is among the best instances I have met with, where the advantages of such means were duly appreciated and early adopted. However, it may be said that, in general the impelling power is *strictly confined* to driving the threshing-machine and connections of it. Indeed, unless the steam-engine has ample power, it would be useless attempting to work more than the mill at one time; but we see, if the power is judiciously arranged, that even a steam-engine of *only* six-horse power can be made of powerful avail to the farmer.

It seems singular that the farmer of the present day does not turn more attention to these useful applications of ingenuity so advantageous to himself, of which I have given so striking an example; for, when we turn to the century that is past, which we are so apt to deride for its want of mechanical contrivances, and thank so much behind the present age, we shall find much to admire if we have the patience to investigate. If we turn to the works of Dr. Stephen Hales, F.R.S., and other writers, farmers will find much curious and useful information. His plan of keeping corn sweet in sacks was considered of great benefit to farmers. A hollow reed or cane, perforated with 200 holes, was placed in the sack, and the nose of a common kitchen bellows placed into a wooden faucet attached to a leathern pipe ten inches long, distended by a spiral wire fixed to the top of the stick. Each stroke of the bellows would discharge a quart of air, sixty-four strokes per minute would convey a quantity of air equal to the capacity of a four-bushel sack.—With the steam-power at command at the farm to drive a blowing-fan, such a scheme as this could be easily adopted by the farmer, and still exceed the plan of preserving corn by ventilation, which was much thought of at the time, although ventilators of a much simpler construction can now be readily applied for the purpose. It is stated (in the *Gentleman's Magazine*, 1739) that the ventilators contrived by Dr. Hales for preserving corn were so much esteemed in France that M. de Hamel de Monceau, a Member of the Royal Academy of Sciences, preserved a large heap of corn free from

*The word mill is used indiscriminately for threshing-machine.

weevils for two years, without turning it, merely by *blowing air up through it.* He likewise procured a large granary to preserve, in the same manner, with ventilators worked by a wind-mill, quantities of corn, with a view of introducing it as a general practice in France. Dr. Hales also applied his ventilators very usefully for sweetening milk when ill-tasted, also for water, by blowing showers of air through it. His ventilators in diaries would be found advantageous. If such was the knowledge of these matters in the last century, it seems singular how little has been really done to follow out the experience they acquired; yet it is not the less curious to observe the coincidence that so often happens between past and present inventions; for the plan I have described as applied for drying grain in East Lothian, is a counterpart of the very thing recommended by Dr. Hales for drying malt, hops, &c., only the latter had the advantage in recommending blowing fresh air upward through wooden bars, "*or large laths, nailed to the floor, and hair-cloth to be laid on them.*"

While, therefore, improving the present inventions, do not let us overlook the past, and claim, as new ideas and inventions, what may have been known and applied centuries before. Let the information and applications of the past be acknowledged as so much experience gained, and incorporated with the superior advantages in mechanical construction of the present times.

In applying the steam-engine power to subordinate purposes, and mixed machinery at new farm offices, there is more scope for the exercise of skill and judicious arrangement on the part of the farm-architect and engineer than when steam is made use of at old farm buildings. The method of connecting the first power to the machines, likewise admits of difference of opinion. It is sometimes done by belts and sometimes by cogged and bevelled wheels. Although there is more friction by wheels, they are generally preferred by engineers, as belts are apt to slip, and cannot be durable, instances being found where in places in barns, or places infested with rats, they are even destroyed by these vermin. All main shafts or axles are invariably preferred to be connected with wheels, and likewise in connecting subsidiary or minor shafts to the first mover, wheels are made use of, although, in many instances, belts must be had recourse to, and, by having several shafts to lock and unlock to the main crank shaft, or to go easily in or out of gear, a variety of useful machines may be driven by steam-power at every farm at which steam is made use of.

At new farm buildings, in addition to driving threshing-machine, the whole array of the minor implements or machines of the barn, and machines for preparing food for cattle and horses, machines for working the dairy utensils, machines for preparing artificial manures, machines for pumping or irrigation, by means of hose, machines for preparing grain for seed, and machines for giving warmth and ventilation, might all be attainable, and easily made applicable at every farm, by means of steam-power.

Although such machinery may at first view appear *complicated*, yet in *reality it is not so*, and might be made of very easy management. I need not enter into any minute description of the methods of applying such subordinate machines as may be thus adopted. The details must be left to individual skill to execute. It is sufficient here that I suggest and point out the practicability of easily following out the suggestions made. With this view, the germ of such an arrangement of subordinate machines, applicable to the various purposes above noticed, I shall briefly describe.

A steam engine of ample power (suppose six, or eight, or ten horse power, for farms varying from 220 acres and upward) is erected, in the first instance, to drive the threshing-machine, and is supposed to be in daily use, as the *extended* application of steam-power *implies that the* farmer will find it to his advantage to make use of the engine almost constantly, or, at all events, in winter, to have the fire on the boiler. To be of real utility, the power must be generally available at command, at least more frequently in use than *presently* done, where the engine and boiler remain a dead letter except when threshing is going forward; and where the refuse of coal or culm can be readily obtained, as in coal districts, there can be little poggy wanted for not having the boiler regularly in use, which should be constructed on the most economical principles as regards fuel. The construction of the boiler is of most paramount importance in farm-engines, both as regards economy and safety. We have seen what was done in locomotive engines, by industry and economy in fuel, shown fully in Mr. MacNeil's evidence before the House of Commons in 1832. The evidence of Mr. MacNeil in convincing the Committee that experience will soon teach a better construction of the engines, and a less costly make, and generally a requisite supply of steam. When the steam-engine was not required for the purposes of the barn, it might, perhaps, in many farms, be advantageously employed for the purposes of pumping and irrigation. Supposing the engine, therefore, to be nearly in daily use, and having every modern improvement, and the threshing machine of similarly improved construction, with elevators, hummeler, corn and bean bruiser, &c. &c. By a direct shaft from the steam-engine, with the power of attaching or detaching, taken in or out of gear at pleasure, meal or flour mill stones are applied, these, if inconvenient, to be worked by the farmer, or, if the corn-mill divides his attention too much, I have given an example where the spare power of the engine was let off to a neighboring miller. In several instances, however, I have met with far-

mers who advantageously made use of flour, barley, or meal mills at their farms, and if not used for grinding, a pair of stones would be found of great advantage for bruising grain, and several have been applied for this purpose in the South of Scotland and in Northumberland, at large farms, as much more powerful than the common corn-bruising rollers. From the same shaft a rape-mill, an oil-cake crusher, or even a malt roller, could be easily applied, and a circular saw be driven, and, if thought requisite, a bone-mill could likewise be wrought by the same shaft, and in many farms found useful for converting ashes, and a variety of otherwise useless rubbish, into fertilizers." Another shaft passing through the straw barn could easily work a straw and hay cutting machine, and also a turnip and potatoe slicer. The farmer could be conveniently placed in the stable court (at no great expense a hay-loft might be made above the straw barn) and the cutter could be placed very conveniently near the cattle court, at the turnip court, or, if preferred, the straw-cutter could be advantageously placed there, instead of the turnip slicer, as these are found so useful in the field.

Other minor machines could easily be driven from these two shafts as they pass through the respective barns—such as a butter churn for dairy purposes. I have not dwelt much on machinery for dairy purposes, because dairy farms on a large scale, are rarely combined with grain farms. However, as every farmer is more or less connected with feeding cattle and making butter and cheese, it must be obvious that the command of steam power gives many advantages, and points out how the female department of the household can be saved much useless labor, and their attention turned to more profitable purposes. Thus the labor of churning by the churning-machine worked by steam-power will enable a great deal more work to be done in much less time.

In addition to the machines I have noticed at the general farm, I may mention that a very simple contrivance might construct a *tram*-way and wagon to the threshing loft, by which the engine could be made to *draw up* the grain to supply the threshing-mill, and *return down* the empty wagon, saving much manual labor. Elevators for grain could also easily be constructed to *lift up the grain* to the granary, and lower it upon the carts, wrought by the steam-engine.

The above are a few out of many practicable purposes to which mechanical science may be made to economize human labor, and render the exertions of the *farmer* more advantageous to himself. But a new element is mixed up with the applications of the steam-engine to farms, which, in another point of view, gives it still greater advantages, and these of a practical kind. I allude to the use *which can be made of* the *steam itself*.

A steaming apparatus is a necessary appendage to every farm of a moderate size, and its utility is very generally appreciated. The steam is commonly raised by a separate boiler, but very little skill would be required in applying the steam from the engine boiler to a complete steaming apparatus for cattle. The objections of the steam not being in constant use I have already alluded to. Where, indeed, the farmer is *resolved* merely to confine his steam-engine to threshing of grain, of course a portable steam-power would not apply—it would be inexpedient, perhaps, to draw steam from his engine boiler, or even put water for boiling turnips in wintering cattle. But the time will soon be past when the farmer will cease to be told, "What a pity it is you cannot make use of your steam-power, except merely for threshing, after going to so much expense for its erection—it is thus useless to you (keeping it idle) two-thirds of the *year*." As I have said, a test for the ingenuity of the farmer is to be shown, and he will be judged of as the cleverest and most practical farmer whose skill has brought out the most numerous and useful applications. Hence, in this light, a steam-power is to be judged of not merely as a *motive power* —which water can as chiefly perform, or which, some day, electro-magnetism* may, perhaps, as cheaply effect—but as possessing advantages *per se*, which I shall attempt shortly to point out. The boiler of the engine, which ought to be no longer than really required to give *steam enough* to prevent waste of fuel in winter, must be daily regularly heated, and then either steam from it, or hot water, as may be required, is to be obtained for preparing food for cattle. It is likewise to be made equally available for stable use. The advantages of having hot water *at all times* in stables is appreciated by every gentleman who takes an interest in his stud.† The spare steam can be made easily to heat a complete range of cottages for farm servants, which may be situated in connection with the farm offices as not to be inconvenient.

We have already seen the facility by which the spare steam was made use of, at a very small expense to heat a drying loft; even the heat of the boiler itself might be of utility for damp grain placed above the boiler shed, as is frequently done for drying-houses of manufactories.

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*Although there is little prospect at present of electro-magnetism being brought into use in this country as a moving power of machinery, yet it is stated it has already been brought to considerable advancement on the Continent—and the very ingenious applications of this powerful agent, by Mr. Daniels, and others, holds out a decided prospect of its more extended applications. A very clever model of a machine, driven by electro-magnetism, was shown at one of the Highland and Agricultural Society's monthly meetings, by Dr. Aiton of Dolphington, and an interesting account read by him of the application of electro-magnetism to machinery.

†In some stables the whole range of sleeping-lofts or apartments for the grooms were heated, under my directions, by hot-water pipes or steam; likewise water tanks, or cisterns for the stalls, were heated by hot pipes passing through them.

The utility of this plan must not be overlooked in making arrangements for using steam-heat, nor likewise the simplicity by which the same agent could be applied for a clothes-drying house for family use. Nor must we forget the advantages of heating poultry-houses with spare steam-heat, or even the poussiniere, or nursery for egg-hatching. Nor is this chimerical—the poussiniere of M. Bonnemain, invented fifty years ago, heated by hot-water pipes, or steam, we are told, was found to be an ingenious and profitable establishment; and this plan, as old as the Egyptians, while it has been revived within these few years, affords to the busy housewife, where her spouse has laid out a few pounds on the erection of a steam-engine, or steam-mill as it is called, or boiler, an ample supply of heat for bringing chickens in winter into market, to reward her with a profitable investment. The above are merely a few things of the many this powerful agent can be made to do, even on a small scale; nor must I forget, for the housewife, the washing-machine, both *driven* by steam-power, and *supplied* with steam, and other excellent applications of steam, many of which will be found described (as they have been practically applied) in Silvester's Domestic Philosophy.

The great distance to which steam can be conveyed from the boiler would excite surprise to those who have never seen it; hence there could be no difficulty in applying it, in addition to what is stated, to many horticultural purposes—such as warming a hot-house and conservatory, and pine or melon pits, or even forcing land, or garden ground. The daily new inventions and purposes to which it is applied point out an inexhaustible field for extension.

But the utility of the steam-engine is not practically exhausted; the boiler chimney could be made of the greatest utility for an important purpose—*ventilation*—a thing so much neglected in most arrangements. The whole range of stables, cattle-sheds, and even piggery, grain lofts, &c., could be brought under a perfect system of ventilation by the fire draught, by means of metal or wooden pipes, or brick or stone flues, communicating with the ash-pit of the furnace—a plan which has been long known,* yet so little practically made available. The importance of ventilation to stables, though generally admitted, is frequently neglected. Although we have many examples on record, especially in horse-barracks in the army, of the evil consequences of bad ventilation—as all animals, when confined, rapidly destroy the atmosphere, both by respiration and secretitious exhalations from the skin—producing carbonic acid, and other ammoniacal and mephitic gases. Hence the lower animals require *even more air* in the same ratio than the human race; and, to keep horses, cattle, poultry, sheep, pigs, and dogs in a healthy condition, and free from cutaneous diseases, when much confined, besides wholesome food, a constant renovation of the air must go on: and even in stables, if heat is required, which it must be, it is surely better to provide artificial heat, by passing a steam-pipe through the stable, than by enclosing the animals in a loose box heated by their own exhalations, or by closing the stable up, to allow them, as it is termed, to draw heat from one another. I do not think sufficient attention is ever paid, in the construction of stables and cattle-houses, to the necessity of ample *light* as well as *air*. The effect of want of light on vegetables and plants is so well known, that there can be no doubt light is equally required for the health of man and the lower animals. In addition to the stables, &c., the same range of cottages which I have shown could be so easily heated with spare steam, or hot water, from the engine-boiler—could with equal effect, be ventilated by flues drawing or sucking out the impure air to the furnace—or if the fire draught was found inconvenient, or thought objectionable, as has been said, for "attenuating the air," then the wind fan could be driven by the steam-engine, to effect the same purpose. In all and every case to which ventilation is applied, whether to suck out the impure air from cottage or stable, provision is to be made for the inlet of fresh air, as well as the escape of impure air. Thus, with a little expense in the first arrangement, farm-house, cottages and offices could be placed under a thorough system of ventilation—under perfect control; and the same agent which effected this would supply, without more cost for fuel, an ample supply of heat to warm with salubrity many cottages; even ample supplies of warm air, if preferred, heated by steam, might be distributed, thereby increasing the comfort of the cottage fire or the farmer's hall.

In addition to all this, an agent so accessible as the engine chimney might be applied to other useful purposes—to preserve the roof and timbers of the buildings, as well as so contrived that a flue from each stalk in the yard might create a circulation of air in wet weather, and prevent the heating of grain in the sack.

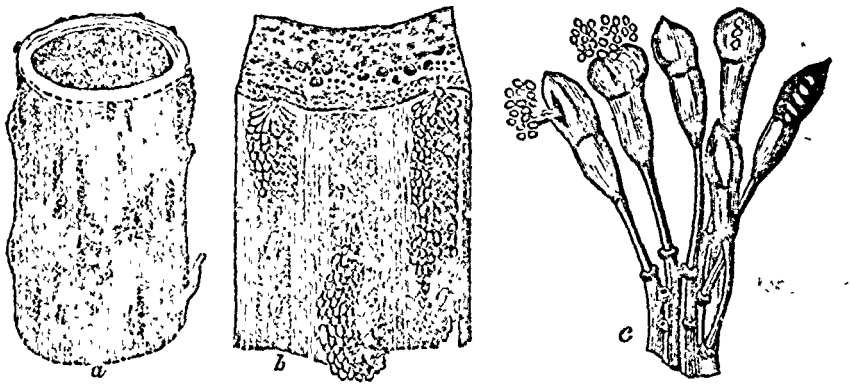
I might pursue this subject still farther, but I am well aware that even much of what I have already suggested the farmer may be apt to regard as chimerical, and inconvenient for him to adopt in practice. This I am prepared to expect. But opposition of this kind goes for nothing. It is like the slow sailing-ship in the wide sea, which is soon distanced by more active competitors. When we remember the state of the Scottish farms of old, and contrast them with the improved state of modern tillage, and knowledge of chemical properties of soils and manures, we may observe what a few years have already produced, and what a prospect of progressive advancement is still held out. I agree with Mr. Babbage "that Science and Knowledge are subject, in extension and increase, to have effects quite opposite to those which regulate the

*See an account of this, in a paper read by the writer before the Royal Society of Arts, 10th April, 1843; and printed in the Society's Transactions.

material world; the farther we advance from the origin of our knowledge, the larger it becomes, and the greater power it bestows upon its cultivators to add new fields to its dominions. . . . The mind contemplates the past, and feels irresistibly convinced that the whole already gained bears a constantly distinguishing ratio to that which is contained within the still more rapidly expanding horizon of our knowledge. . . . The experience of the past has stamped with the indelible character of truth the maxim that '*knowledge is power.*'"

[Jour. of High. and Ag. Soc. of Scotland.

RUST IN WHEAT.



Our readers no doubt by this time are well acquainted with our views upon rust in wheat, and as we have no new theory to offer, we shall content ourselves for the present, by giving the above drawing and explanation of this direful enemy to the wheat grower.

We shall carefully watch the progress that this disease may make upon the wheat crop this summer, and if any thing of interest should come under our observation, we shall not fail to give it an early insertion in our columns.

The above is a representation of rust in wheat, as we find it delineated in Johnson's Encyclopedia. *a*, is a portion of wheat straw, magnified, to show the parasitic plant or fungus, which is called rust, or mildew. *b*, is a small section of the straw, much more strongly magnified. *c*, is a very highly magnified representation, showing a small part of the bottom of a pore in the straw, with some of the parasitic fungi growing upon it. Two of these are represented as seen bursting and scattering their seeds.

The exceeding minuteness of this vegetation will give an air of improbability to the description, with those who have had limited opportunities of observing the wonders of nature's works. In reality, however, it is no more surprising that vegetables should exist and mature and scatter their seeds, which are too small to exhibit any organized form to the naked eye, than it is that hundreds of animals, of new and strange forms, perfect in all their parts, but imperceptible to the naked eye, should be discovered in a single drop of marsh water.—*Mich. Far.*

Salt for Horses.—A person who kept 16 horses made the following experiment with 7 of them which had been accustomed to eat salt with their feed. Lumps of rock salt were laid in their mangers, and these lumps previously weighed were examined regularly, to ascertain what quantity weekly had been consumed, and it was repeatedly found that, whenever these horses were fed on hay and corn, they consumed only two and a half or three oz. per day, and when they were fed with new hay, they took six ounces per day.—This fact should convince us of the expediency of permitting our cattle the free use of salt at all times; and it cannot be given in so convenient a form as rock salt, it being much more palatable than the other in a refined state, and by far cheaper.—*Bos. Cult.*

SHORT HORN BULL.

Through the politeness of A. B. Allen, Esq., editor of the *American Agriculturist, N. Y.*, we are enabled to present to our readers the above beautiful drawing of a short horn bull. Mr. Allen has consented to furnish us with wood cuts, at a most reasonable rate of charge, by which arrangement we shall be able, with Mr. Lowe's valuable assistance, to illustrate each number of the *Cultivator* with a few valuable engravings. The first class breeders of improved cattle would find it greatly to their advantage to have portraits of the best specimens of their stock taken and published in our journal. Unless such a course be taken, the Canadian stock-breeders need not expect that their business will be greatly advanced by the public.

Improved breeds of Pigs wanted.—John J. Malloch, Esq., President of the Perth Agricultural Society, desires us to inform him where a breed of pigs can be procured, that when about nine months old will make 200 pounds of pork. Pure bred animals of this kind are not to be had in this section of country; but good Liecesters, Berkshires, North Durhams, and Yorkshires are in abundance, that can be made to come up to this weight. Pure bred pigs are rare to be met with in Canada, and in our opinion it is now high time that a number of fresh importations were made to cross upon the mixed stock of the country. If any of our subscribers can furnish Mr. Malloch with the desired information, they would oblige us by doing so at an early opportunity.

Dead Animals.

Animal matter contains every element that is necessary to grow every plant known. In it are phosphate and carbonate of lime, ammonia, carbon, in short, in the best form, all the essentials of vegetable growth. Whenever a fowl, cat, dog, sheep, pig, horse, or cow dies, let the carcase be cut up, and added to the manure heap. The carcase of a single horse will turn loads of useless muck or peat into manure, richer than any ordinary barnyard dung. Why then suffer it to decay uselessly and annoyingly? It is true it is not lost, for the gases that taint the air are appropriated by plants; but the farmer who owned the animal gets but a small portion of what should be all his own. Why will he waste the *dead* energies of the horse, when he has lost the living ones?

If our readers will heed what we say, they will not suffer dead animals to annoy the eye and disgust the nose hereafter. Bury them in the manure heap, add some quick lime to hasten decay, and charcoal dust or plaster to absorb the gases, and much will be gained in the good appearance of the farm and in the quality of the manure. If your neighbor be so improvident as to waste a dead animal, beg it of him, that it may not be detrimental to health and useless to vegetation. Laws should be passed to compel the saving of this most powerful of fertilizers, when common sense and decency fail to do it.

Whenever it is desirable to hasten decay, and rapidly turn animal matter into manure, sulphuric acid may be used This would be too expensive (although the acid is cheap) for farm purposes, but may be employed for the garden, where expense is not so important. It is frequently desirable to have a rich manure in the garden, when it is not at hand. Animal matter put into sulphuric acid will in a few hours furnish it. Every house will supply much refuse animal matter.—To this, rats, mice, feathers, hair, bones, horns, &c, may be added. If the garbage of a slaughter-house can be got, it should be. All these will soon be reduced to an available state, be inoffensive, and add great fertility to the soil where used. The requisite quantity of acid may be ascertained by experiment—about 10 or 15 lbs is usually allowed for 100 lbs. of animal matter.—*Am. Ag.*

Hoof Ointment.—Tallow, 1 pound; tar, 1 pound; black resin, 1 pound; lard, 2 pounds spirits of turpentine, 1 pound. Mix.

Dignity of Labor.

It is the man who determines the dignity of the occupation, not the occupation which measures the dignity of the man. Physicians and surgeons perform operations less cleanly than fall to the lot of most mechanics. I have seen a distinguished chemist covered with dust like a laborer. Still these men were not degraded. Their intelligence gave dignity to their toils; Let me add, that I see little difference in point of dignity, between the various vocations of men. When I see a clerk, spending his days in adding figures, perhaps merely copying, or a teller of a bank counting money, or a merchant selling shoes and hides, I can not see in these occupations greater respectableness than in making leather, shoes or furniture. I do not see in them greater intellectual activity than in several trades. A man in the fields seems to have more chances of improvement in his work, than a man behind the counter, or a man driving the quill. It is the sign of a narrow mind, to imagine, as many seem to do, that there is a repugnance between the plain, course exterior of a laborer, and mental culture, especially the more refining culture. The laborer, under his dust and sweat, carries the grand elements of humanity, and he may put forth its highest powers. I doubt not, there is as genuine enthusiasm in the contemplation of nature, and the perusal of works of genius, under a homespun garb as under finery. We have heard of a distinguished author, who never wrote so well, as when he was full-dressed for company. But profound thought and poetical inspiration have most generally visited men, when from narrow circumstances or negligent habits, the rent coat and shaggy face have made them quite unfit for polished saloons. A man may see truth, and may be thrilled with beauty, in one costume or dwelling as well as another; and should respect himself the more for the hardships, under which his intellectual force has been developed. —*Channing.*

Cure for Quinsy.—Simmer hops in vinegar a few minutes, until their strength is extracted; strain the liquid, sweeten it with sugar, and give it to the child or patient, in small quantities, until relieved. This is said to be an excellent medicine.

Diarrhœa in Calves.—Two table-spoonsful of ground allspice, in three gills of boiling water, once in two hours, will speedily effect a cure.

Healing Wounds on Trees.

The *Maine Farmer* gives the following recipe, which he recommends as an excellent composition to be applied, in a state of solution, to wounds on trees. His (Dr. Holmes) accompanied remarks are so much to the point, that we copy them entire. Probably no branch of rural economy is so much neglected in this country as orcharding; and to induce the Canadian farmers to improve in this particular, we shall endeavour to keep the most modern improvement in the art constantly before their notice. It costs but a trifling more expense to keep an orchard in a healthy condition, than to neglect it. Twenty trees properly attended to, are better than one hundred, managed in the ordinary way, which means, to let it take care of itself. Cattle and vermin of every description should not be admitted in a young orchard. The first may be prevented by constructing a good fence, and the latter by liberally liming the grounds immediately around the roots of the trees. Young trees should be carefully washed every spring with weak ley, or a strong solution of common soft soap. To the distance of three feet from the trunk of the tree, the ground should be not only liberally limed and dunged, but should be thoroughly cultivated with a spade every spring. Trees managed in this way will make double the wood that they otherwise would do, and the fruit will not only be increased in quantity, but quality.

If the curious are anxious to make an experiment, they would do well to try the following plan, to secure a limb or even the whole tree to bear fruit.—In the latter part of June, take a sharp knife, and make an incision through the bark, around the entire limb. The limb thus girdled, will grow much faster than the other portions of the tree, and the following season will be thickly set with fruit.

"Take one bushel of fresh cow-dung, half a bushel of lime rubbish of old buildings (that from the ceilings of rooms is preferable,) half a bushel of wood-ashes, and a sixteenth part of a bushel of pit or river sand. the three last articles are to be sifted fine before they are mixed; then work them well together with a spade, and afterwards with a wooden beater, until the stuff is very smooth, like fine plaster used for the ceiling of rooms.

"The composition being thus made, care must be taken to prepare the tree properly for its application, by cutting away all the dead, decayed and injured parts, till you come to the fresh sound wood, leaving the surface of the wood very smooth, and rounding off the edges of the bark with a draw knife, or other instrument, perfectly smooth, which must be particularly attended to, then lay on the plaster about one eighth of an inch thick, all over the part where the wood or bark has been so cut away, finishing off the edges as thin as possible: then take a quantity of dry powder of wood ashes mixed with a sixth part of the same quantity of the ashes of burnt bones, put it into a tin box, with holes in the top, and shake the powder on the surface of the plaster, till the whole is covered over with it, letting it remain for half an hour, to absorb the moisture, then apply more powder, rubbing it gently with the hand, and repeating the application of the powder till the whole plaster becomes a dry smooth surface.

"All trees cut down near the ground should have the surface made quite smooth, rounding it off in a small degree as before mentioned; and the dry powder directed to be used afterwards should have an equal quantity of powder of alabaster mixed with it, in order the better to resist the dripping of trees and heavy rains.

"If any of the composition be left for a future occasion, it should be kept in a tub, or other vessel, and urine of any kind poured on it, so as to cover the surface; otherwise the atmosphere will greatly hurt the efficacy of the application.

"Where lime rubbish of old buildings cannot be easily got, take pounded chalk, or common lime, after having been slacked a month at least.

"As the growth of the tree will gradually affect the plaster, by raising up its edges next the bark, care should be taken, where that happens, to rub it over with the finger when occasion may require (which is best done when moistened by rain,) that the plaster may be kept whole, to prevent the air and wet from penetrating into the wound.

"To the foregoing directions for making and applying the composition, it is necessary to add the following:

"As the best way of using the composition is found, by experience, to be in a liquid state; it must, therefore, be reduced to the consistence of pretty thick paint, by mixing it up with a sufficient quantity of urine and soap-suds, and laid on with a painter's brush. The powder of wood-

ashes and burnt bones is to be applied as before directed, patting it down with the hand.

"When trees are become hollow, you must scoop out all the rotten, loose, and dead parts of the trunk till you come to the solid wood, leaving the surface smooth; then cover the hollow, and every part where the canker has been cut out, or branches lopped off, with the composition, and, as the edges grow, take care not to let the new wood come in contact with the dead, part of which it may be sometimes necessary to leave; but cut out the old dead wood as the new advances, keeping a hollow between them, to allow the new wood room to extend itself, and thereby fill up the cavity, which it will do in time, so as to make, as it were, a new tree. And if it be large, you may cut away as much at one operation as will be sufficient for three years. But in this you are to be guided by the size of the wound, and other circumstances. When the new wood, advancing from both sides of the wound, has almost met, cut off the bark from both the edges, that the solid wood may join, which, if properly managed, it will do, leaving only a slight seam in the bark. If the tree be very much decayed, do not cut away all the dead wood at once, which would weaken the tree too much, if a standard, and endanger its being blown by the wind. It will, therefore, be necessary to leave part of the dead wood at first, to strengthen the tree, and to cut it out by degrees as the new wood is formed. If there be any canker or gum oozing, the infected parts must be pared off, or cut out with a proper instrument. When the stem is very much decayed, and hollow, it will be necessary to open the ground and examine the roots.

"Some months before the publication of the "Observations on the Diseases, &c in fruit and Forest Trees," I had tried the composition in a liquid state, but did not think myself warranted to make it public until I had experienced its effects through the winter. The success answered my most sanguine expectations; and I have used it in this way ever since. By using the composition in a liquid state, more than three fourths of the time and labor is saved; and I find it is not so liable to be thrown off as the lips grow, as when laid on in the consistence of plaster: It adheres firmly to the naked part of the wound, and yet easily gives way as the new wood and bark advances.

"The first time I tried the composition was in a liquid form upon an elm which had been planted about twenty years. It had been very much bruised by the roller, had several cavities in it, and was very much bark-bound besides. Having prepared the wounds, and applied the composition with a painter's brush, I took my knife and scarified the tree in four places; I also shaved off, with a draw-knife, all the cankery outer bark, and covered the whole tree with the composition, shaking the powder of wood-ashes and burnt bones all over it. A very heavy rain began in the evening and continued all night; yet, to my great surprise, in the mouning, I found that only some of the powder, which had not had time to dry and incorporate with the composition, was washed off. I now repeated the powder, and without any thing more being done to the tree, the wounds healed up, and the bark was restored so completely, that three years ago, it could hardly be discerned where the wounds had been. The scarifications had also disappeared. Some of the wounds were thirteen inches long, eight broad, and three deep. Since the time it was scarified, the tree has increased ten inches more in circumference than a healthy tree planted at the same time with it, about sixteen feet distant, which was not scarified."

To Kill Moss on Buildings.—Having read an article in a late number of the *Cultivator*, recommending white lead for killing moss on the roofs of buildings, which may be a very good one, I will mention what I think an economical one. Take wood-ashes or lime, and sprinkle them on the roof, near the top, just before a rain, and I think it will kill it as effectually as any thing. If people would wash the roofs of their houses once in three or four years with lime and water, they would not be troubled with moss on them.

By the way, I would recommend to those who are about to cover their buildings with shingles, and especially sawed shingles, to dip them in boiling tar, pitch, or rosin; say, dip the butt ends eight or nine inches and out again, as soon as you will, and enough will penetrate into the shingles to preserve them, I think, double the time that they would last without going through this process.—*Boston Cultivator.*

Gargle for Syphilitic Sore Throat.—Chloride of soda, 4 oz.; distilled water, 5 ounces. Mix.

We give insertion to the following communication, but in doing so, we beg to dissent from many of the views set forth, and more especially the objectionable style in which it is written.—When a farmer sits down to write for the *Cultivator*, he should aim at being practical, and unless this be observed, it would be much better that he had not made the attempt. We wish to state, once for all, that only that class of communications shall have a place in this journal that are calculated to make its readers better farmers and mechanics. If any of the subscribers desire to write on agricultural politics, the political newspaper of the day will furnish them with the best medium for doing so. Many of the ideas advanced by the writer are too true, but nevertheless, he will be able upon reflection to see, that if such articles were to have free access to the *Cultivator*, it would become in a short time, an obnoxious sheet in the eyes of many of its readers.

—

Grand River, April 29, 1846.

SIR,—

I lately saw the address of the Montreal Free Trade Association, as it is called; and as this chimerical document is addressed to the Canadian agriculturists, as well as to merchants, traders, &c., I beg leave, with your permission, to make a few remarks thereon, through your valuable work, the *British American Cultivator*, which every farmer in Canada ought to read, as I think it most cruel and unjust to put young Canada with her cold climate, in competition with, or against old America, with her softer climate and fertile soil, to gratify the avarice of any man or set of men in the world, as this appears to be the bottom of the free trade-mania men. We are told that every thing has or must undergo a great change or revolution; and Joe Hume, after blowing his nose in his *smuggled Bandanna silk handkerchief, declared that he had a right to sell where he could sell dearest, and buy where he could buy cheapest, without respect to friends or country, for he cared but little for his tenants or country either.* By some this may be called *great authority*, although I never knew any country get rich by this free trade maxim. But, Mr. Editor, during the last or eighteenth century, I never saw or heard of merchant kings, cotton lords, shopkeeping princes, nor even lords of learning, now so much talked of, or any other men who took 20 to 150 per cent profit upon goods of any kind; nor did I then hear of men who could say, that after having swept away one race of farmers, they could buy another set, and then turn round and tell the farmer he must or ought to be content with five per cent for his capital, labour, &c.—But do not be surprised, Mr. Editor, when I tell you, that in 1790, or before that time, I could not buy sloe juice for port wine, nor sloe leaves for tea, nor whiskey for brandy, cider mixed with brandy for sherry or Madeira, fish oil for linseed oil, nor even a *lettuce leaf steeped in wine for a cigar.* No, these cheap luxuries, as they are now called, could not then be had—now they are sold in most places as articles of *free trade*. The manufacturers, merchants, and traders of those days were highly respectable men, and wealthy also, and were quite content with twopence in the shilling as profit upon real genuine goods, and less upon large quantities; and when they assumed the honorable character of gentlemen, they supported it on just principles and practice; but I never knew them so uncharitable as to interfere with the agriculturists and their numerous dependants, or even express a wish to fix the price of their productions, for they then thought them good customers to exchange with or sell to, as they generally paid for what they got; they never even thought of building themselves large fortunes upon the ruin of the farmers, nor would such liberal-minded men have thought of *naturalising* American wheat, or other farm produce, by bringing it into Canada; but it is said, that, because *rich England* has given her *greatest boon to Russia, America*, and other powers, (and has nothing now left even for her agricultural sons who have always supported her in war) that *poor Canada* must do the same.—This looks like Sir Francis Bond Head calling in the bank notes here, without a sovereign to take their places, because Peel had caused them to be called in in England, before he had made the sovereigns to take their places, which ruined very many thousands, and crippled a very large portion of the nation. But I must now beg leave to call the attention of the *farm freeholders* of this purely agricultural country to be much more particular in the choice of the men they send to represent them in the Provincial Parliament, as I am not aware that they have been justly and honorably represented yet, neither ought they to

expect it until they send more men from their *own body*. Every trade and profession have heretofore been much more numerously and better represented than the Canadian farmers, who seem to be blinded by political opinion against their own interest, so that the consumers of agricultural produce, by their representatives, fix the price of it, without knowing or even caring about what it cost to produce it, while the shopkeeper would think the consumer of his goods anything but honest if he were to pretend to fix the price of his goods, or reduce his profits, even if they were cent per cent. We are told that we are to have foreign goods of all kinds 30 per cent cheaper; but almost every thing is now so bad, that I think it makes them very dear, or almost useless. It seems that as soon as a woman puts on a new gown, she ought to sit down and make another, which creates much labour; and the men's clothes and other articles are little better. It seems we want things *much better, and more of them*, and the agriculture of this country to be *well encouraged*, then we should be as independent as our neighbors; getting very rich, by making or raising a new country, is quite another matter, out of the question altogether, although I hear of merchant kings being able to buy almost a township of farmers; this truly seems to be a new and even unjust state of things, and I hope every Agricultural Society in Canada will look well to it, and not suffer themselves to be trampled down by pounds, shillings and pence men, either in parliament or out of parliament, although some of them fancy that England has the mouth of Ganymede, or equal to the Gulf of St. Lawrence, and can eat all the agricultural productions of Europe and America; they do allow, that to do so, she must throw all her inferior lands out of cultivation which find the most labour for her rural population.

I shall now conclude, by asking what right, or on what principle have a board of merchants, shopkeepers, &c., to fix the price of agricultural produce? or would any of these men, or even professional men, send an agricultural man to represent them or their interests in parliament?—There can be no justice in the one case, and the other will never take place; therefore I hope the agricultural population will look better to their own interest than they have done,—if not, they *may soon be swamped by what are called free trade men speculating*. Witness their splendid mansions in Quebec, Montreal, Kingston, Toronto, Hamilton, and other towns, and then go into the agricultural parts and see their poverty in hovels, which look uncharitable and unchristian like.

Yours, &c.

THE ADVOCATE OF JUSTICE TO THE CANADIAN FARMERS.

Cultivation of English Grasses, &c.

A Subscriber has sent us the following communication for insertion, and we trust that some of our old practical farmers will volunteer to furnish him with suitable answers to his enquiries. We would perform this task ourselves, were it not that we are acquainted with many English and Scotch farmers who have had more experience in cultivating the English grasses and the varieties of wheat mentioned, than ourselves.—Those who are qualified should feel a pleasure in assisting us in enlightening the public mind upon all points connected with the industrial interests of the country The columns of the *Cultivator* are always open for all useful communications, and we hope that the friends of improvement will not be backward in doing good when so favorable *an opportunity is presented to them.*

—

Stratford, May 20, 1845.

SIR,—

Having received the following seeds, with others, from the old country, would you or any of your correspondents be kind enough to afford me hints relative to the best mode of cultivating them in this country, and the nature of the land best adapted for their growth and maturity:—

Trefoil, Trifolium Incarnatum, Cow Grass, Red Suckling, Pacey's Rye Grass, Italian Do., Cocksfoot, Meadow Grass, Evergreen do., Crested *Dog's Tail, Long Red Mangel Wurzel, Red* Globe do., Yellow do., Long Yellow do.

I have also received the undermentioned kinds of wheat, and should at the same time feel obliged if you, or any of your correspondents, would give me some information as to the best period of the year for sowing, and the nature of the soil best adapted for them:—

Chitham Wheat, Victoria do., Red Cluster, Red Marygold.

Your obedient servant,

P. S.—Can you by any means tell me if there *is a standard for liquid measure, and the capacity* or weight of the pint or gallon.

Salt--A Fertilizer.

BY C. N. BEMENT.

The value of salt for agricultural purposes, has long been known both in Europe and in this country, and why it has not been more generally used is beyond my comprehension. More than one hundred and fifty years ago, Sir Hugh Platt, an eminent writer of that day, speaks decidedly on the benefits which might be derived from the practice of sprinkling salt upon land, and calls it the "*sweetest* and *cheapest* and the most *philosophical* of all others." He relates the case of a man, who in passing over a creek on the sea-shore, suffered his sack of seed corn to fall into the water, and that it lay there until it was low tide, when being unable to purchase more seed, he sowed that which had been in the salt water, and when the harvest time arrived he reaped a crop far superior to any in the neighbourhood. The writer adds, however, that it was supposed the corn would not fructify in that manner unless it actually fell into the water by chance, and therefore neither this man nor any of his neighbours ever ventured to make any further use of salt water.

The same curious writer tells also of a man who sowed a bushel of salt, long since, upon a small plot of barren ground, and to that day it remained more fresh and green than any of the ground round about it.

Dr. Browntig, who wrote more than a century ago, in speaking of salt, says, "it is dispersed over all nature; it is treasured up in the bowels of the earth; it impregnates the ocean; it fertilizes the soil; it arises in vegetables; and from them is conveyed into animals."

In the neighbourhood of the salt works in Great Britain, the value of salt as a manure is well known and acknowledged; it is said "that when wheat and barley have followed turnips on land which had been salted, the ensuing crop has invariably escaped mildew, although that disease had affected all the lands adjacent, on which salt had not been used."

It has been asserted that salt was the mother of all manures, as every kind of manure is higher or lower in value according to the salt it produces; and every kind of manure is portioned out to the land according to the quantity of salt or nitre it is thought to contain.

"Nothing in nature," said Hollingshead, "is so powerful as salt to meliorate strong and stiff soils, and also to give moisture to dry ground; it is also a certain destruction to weeds and insects. Besides its efficacy on corn and fallow ground, its excellent qualities in giving luxuriance and salubrity to grass lands, are peculiarly worthy the attention of graziers and the breeders of cattle."

"Soils," says an old writer, "which are subject to the grub, and must be fertilized by common dung, which is a proper nest for the mother beetle to deposit its eggs, must be well impregnated with the brine of disolved salt, after the dung is first cut up."

The efficacy of salt in destroying noxious weeds, grubs, and insects, is well known in all parts; but a dose sufficient to kill weeds, would also destroy the cultivated crops; therefore great attention and caution should be taken in not applying too much, when intended to fertilize the soil.

The quantity of salt which it would be advisable to use per acre, for the respective crops and upon the different kinds of land, will be best learned by instituting a set of experiments upon every distinct species of grain and roots. Cold, wet land, requiring more, and loose, light land, though it be poor, requiring less. Four bushels to the acre, harrowed in after ploughing, has been found a sufficient quantity on most soils for corn and potatos; but the best way of all others is for every one to depend upon the results of his own experiments.

To ascertain the exact quantity of salt which may be necessary for the different kinds of land, and to appreciate the benefits which result from its employment in all the various modes of culture adopted in this country, will require several long series of experiments; we would, therefore, suggest to the executive committee of our State Agricultural Society, that they offer rewards to such persons as shall give them an account of the best experiments with this mineral substance, in the different branches of farming and general agriculture.

The safest way for a farmer to adopt, is to use his salt sparingly at first, and in all cases to leave a small portion of the same land without salt, so that the real effects produced by the salt may be, by comparison, in every instance, self-evident and palpable.

That salt is an excellent manure, experience, the most satisfactory of all evidences, clearly proves.

It is stated in an English publication, that "a farmer in the county of Sussex, some years ago had a field, one part of which was very wet, and rushy, and that grass produced upon it was of so sour and unpleasant a kind that the cattle would not graze upon it; he tried several methods to improve it but to little purpose; at last having heard of the benefits of salt as a manure, he determined to try that; for which purpose he procured a quantity of rock salt, which in a random way, without any regard to the precise quantity, he threw upon the rushy ground, fencing it off from the other part of the field, the effects of which was a total disappearance of every kind of vegetation. In a short time, however, it produced the largest quantity of mushrooms ever seen upon an equal space of ground in the country. These in the spring following, were succeeded by the most plentiful and luxuriant crop of grass, far exceeding the other part of the field in the richness of its verdure and the quickness of its growth; the cattle were remarkably fond of it, and though the salt was laid on it twenty years before, this part is still superior to the rest of the field."

An interesting detail from the Rev. E. Cartwright, will be found in the 4th vol. of Communications to the board of Agriculture, England, which is conclusive as to the application of salt as a manure for potatoes. It appears from this communication, that the experiment could not have been tried on a soil better adapted to give impartial results. Of ten different manures which were tried, most of them of known and acknowledged efficacy, one only excepted, salt was superior to them all. Its effects, when combined with soot, were extraordinary, yielding in a row two hundred and forty potatoes, whilst one hundred and fifty only were produced from the row manured with lime. It was observable also where salt was applied, whether by itself or in combination, the roots were free from that scrubbiness which often infects potatoes, and from which none of the other beds—and there was in the field near forty more than made part of the experiments—were altogether exempt. So much for foreign experiments; now let us see what has been done in this country.

From the information which I have been enabled to collect, I am inclined to believe that, when sparingly applied, is valuable as a fertilizer, and useful in destroying the grub and wire-worm which often injure, and sometimes even destroy whole crops; and it has been found by experiments the past season, that the scab, or disease which has proved so disastrous to the potatoe crop in all sections of the country, has been found upon land which had a proper dressing of salt.

Judge Hamilton, of Schoharie, informed the writer that he had found great benefit from using salt on his potatoe ground last spring. After ploughing he caused four bushels of salt to be sown broadcast on the furrow, upon one acre of the field, and harrowed in. Potatoes were then planted. Part of the field was not salted. Although the season was remarkably dry, the salted acre was observed to maintain a green, vigorous appearance, while the other part of the field looked sickly and stunted. On lifting them in the fall, those potatoes where salt had been applied were of good size, smooth skin, sound, and of good quality, and yielded a fair crop, while those on the unsalted part of the field, although the soil was fully equal to that of the salted portion, the yield was considerably less, potatoes small, and much eaten by worms.

His neighbour had a field of potatoes on the opposite side of the road, soil similar to his own, who planted them the usual way, consequently his crop was small, inferior in quality, and most of them rotted soon after digging—they were diseased.

Dr. Bogart, who has charge of the Sailors' Snug Harbour on Staten Island, informed the writer that he applied four bushels of packing salt to one acre of his potatoe ground last spring, and thinks he derived great benefit from it. Though the crop was not a large one, the potatoes on the salted portion were of much greater size, skin smooth, and free from disease. The vines were vigorous, and remained green, while those on land of the same quality adjoining, which was not salted, shrivelled and dried prematurely; the rubbers small and watery; produce less.

E. M. Stone, in a late number of the N. E. Farmer, says: "Last spring I tried an experiment on potatoes. I planted in my garden 50 or 60 hills, placing the sets directly on the manure. I put to about half of the hills a table-spoonful of salt, after slightly covering the seed to prevent immediate contact. I then finished covering. The hills so treated, yielded potatoes entirly free from blemish, and of excellent quality. The produce of the residue was badly affected by rust,

or scab, and worms, and was hardly worth harvesting."

Professor Morren also directs attention to the importance of salt as a means of repelling the disease. He recommends the tubers to be placed in a steep composed of 54 lbs. of lime, 7 lbs. of salt, and 25 gallons of water.

Mr. J. E. Teschemacher speaking of the potatoe disease in the *N. E. Farmer*, says: "I think that salt, lime, and several chemicals will destroy the disease. I prefer salt, because when mixed in the soil it may get into juices, and circulate through the whole plant. Lime or lime-water would do the same, to a certain extent, but it is far less soluble than salt."

The following very interesting detailed experiment with salt, was communicated in the 9th vol. and 5th number of the *Cultivator*, by J. C. Mather a very intelligent and spirited farmer of Scaghticoke. He says:—"In the spring of 1838, we broke up six acres of sward land that had been mowed a number of years, intending to plant it to corn, but observed when ploughing, that the ground was infested with worms—the yellow cut, or wire-worms, and black grubs.—as we had mostly lost our corn crop the year previous, by having the first planting almost entirely destroyed by the corn worm above described, we expected a like calamity would follow the present year, unless some preventive could be used to destroy the worms. And having frequently and unsuccessfully used all the recommended remedies to destroy the corn worms, we were induced, at the suggestion of an English labourer, to try salt. After the ground was thoroughly harrowed, five bushels per acre were sowed broad cast, leaving a strip of near half an acre on each side of the field, to satisfactorily test the experiment. The whole was then planted to corn and potatoes. The corn on the part where no salt was sown was mostly eaten up by the worms, and was reploughed and planted to potatoes. The potatoes on the whole lot were a good crop, but decidedly better where the salt was applied. I regret that we did not ascertain by measurement the actual result. There was a very perceptible difference in the appearance of the vines during the whole summer. On the part where the salt was sown they grew larger and were of a darker green color, and continued green longer in the fall than the others."

"In the spring of 1839 we spread on a good coat of manure, and planted it all to corn, except about half an acre of the salted land, which was planted to Rohan-potatoes. The Rohans were the best crop of potatoes I ever saw. Seed planted, two and a half bushels, produced over 3000 bushels. The largest potatoe 4¼ lbs The corn was a heavy crop, but was not measured. The summer was very dry and hot; but the corn on the salted land did not appear to suffer at all from the drought, while the other was considerably injured. The salted land appeared always moist, and the growth of every thing upon it was very rapid. We found great difficulty in keeping the weeds down. After three successful hoeings, we were obliged in August to give it a hand weeding. Spring of 1840, intended to have stocked the land down for meadow; but thinking it too rich for oats, planted potatoes without manure. Crop good. The effects of the salt still very apparent. Adjudged to be one third-more potatoes where the land was salted."

"Spring of 1841, sowed part of the lot to oats, remainder to potatoes and onions, without manure The onions were a great crop. The summer was very dry, but they did not suffer, while other crops in the neighborhood, on similar soils, were nearly destroyed by the drought. The oats were a heavy crop and much lodged on the salted part The clover grew well, and produced a fine crop of fall feed. This I cannot account for, except by supposing that the salt kept the land moist, or attracted moisture from the atmosphere, as I know of no other piece in the town that was well seeded last year; it was almost an entire failure; and the most of the land stocked down last spring has been or will be ploughed up in the spring to be seeded.

"We sowed salt the same spring on a part of our meadows. The grass was evidently improved, the result satisfactory, and we shall continue to use it on our meadows."

"At a farmers' conference meeting, held at Marcellus, Onondaga county, in November last, Mr. Brown, President of the County Agricultural Society, said, "he had used salt as a manure with great benefit. He sowed it broad cast upon wheat and grass at the rate of three to five bushels to the acre. On grass he would sow it in the fall—for wheat he would sow it just before the wheat is sown. He found that three bushels of salt to the acre on his wheat field, occasioned an increase of seventeen bushels of wheat to the

acre over that which had no salt. The soil was a strong loam with stiff subsoil."

Cuthbert Johnson, a distinguished agricultural writer, strongly recommends salt as a manure, at the rate of ten to twenty bushels per acre, to be sown some two or three weeks before the seed is put into the ground. He says the benefits are as follows: 1st, When used in small quantities it promotes putrefaction. 2nd, By destroying grubs and weeds. 3rd, As a constituent on direct food. 4th, as a stimulant to the absorbent vessels. 5th, By preventing injury from sudden transitions of temperature. 6th. By keeping the soil moist."

It would seem from all the facts I have been able to collect, that it corrupts vegetable substances when mixed in small quantities, but preserves them when it predominates in a mass; that in dry seasons its effects are more apparent, and whether it attracts moisture from the atmosphere, or whether it acts as a stimulant or condiment, is of no consequence so long as its effects are certain.

On account of the small quantity of salt, in weight, required for manuring lands, it is no inconsiderable recommendation, because on that account it may with ease be conveyed to the most rough, steep and mountainous parts, to which the more bulky or heavy manures most in use could not be carried, but with great labor, and at an expense far exceeding the advantages to be effected from them.

For a top dressing, a composition of salt and lime, four bushels of the former and twelve of the latter, to the acre, have been highly recommended for grass lands infested with moss, and promoting a more vigorous growth of grass — Its beneficial effects on asparagus beds is well known to gardeners, giving a deeper color and a more vigorous growth to the plants.

Salt itself is considered, by some, rather too harsh in its nature, but a mixture, say six bushels of dry ashes to ten of salt, is sufficient for an acre, and shou'd be spread upon the furrow and harrowed in. By being thus mixed, one particle incorporates with and mollifies the other, and if conveyed into the earth by a soapy, smooth method, will prove the real enricher the earth, wants to send forth vegetation.—*Quarterly Journal of Agriculture and Science.*

Superior Mode of Curing Hams.—Agreeably to your request I herewith send you the process of curing the hams I sent you in March, which called forth the admiration of the American Agricultural Association, and the Farmer's Club, at New York.

I made a pickle of two quarts of salt, to which I added one ounce of summer savory, one ditto sweet marjoram, one ditto allspice, half ditto saltpetre, and one pound brown sugar: boiled all together and applied the mixture boiling hot to one hundred pounds of hams, and kept them in the pickle three or four weeks.

My process of smoking was not the most expensive, but may not be the less available on that account. I smoked the hams in a seed cask, with one head in, with a small hole for the smoke to pass out, hung my hams to the head, and used about a peck of mahogany sawdust for fuel, which I happened to have on hand for packing goods. I smoked but one week. W. S.

Boston, May 6th, 1846.—*Am. Agr.*

Liniment.—I send you a recipe for a liniment, which has been long in use, and has been found highly efficacious in all cases of sprains, bruises, and wounds, external or internal, on man or beast. It has been used with great success in severe cases of rheumatism, often effecting a positive cure, and no farmer should be without it who has not something better to substitute in its place.

One-half oz. spirits hartshorn;
Two oz. camphor gum;
One gill spirits turpentine;
One-half pint sweet oil;
One pint alcohol.

Shake it well together, and apply, rubbing it in smartly with the hand. JUNIUS.
—*Alb. Cult.*

Preventing Incrustation in Steam Boilers.—It has been found by experiments on the Southampton (Eng) railway, that putting muriate of ammonia, commonly called sal ammoniac, into the boiler, it will prevent the incrustation or deposit on the inside of boilers, which is frequently so troublesome to engineers. About a pound of ammonia, for 1500 or 2000 gallons, is sufficient. It has been found to have no effect upon the iron whatever. In order, however, to ascertain whether this substance will answer in all cases, it will be necessary to try it in places where the water used is impregnated with different substances.

Rearing Cattle.

The Rearing of Cattle, with a view to Early Maturity, as Practiced in Berwickshire, England. By Mr John Wilson, Edington Mains, Berwickshire.

The valley of the Tweed has long been famed for the rearing and fattening of cattle, its rich pastures, warm turnip-soils, and proximity to England, affording peculiar facilities for prosecuting this branch of rural economy. The Short-Horns were early introduced into it, and soon became its established breed; and though still inferior to the Tineside herds in symmetry, color, and grazing quality, yet nowhere, perhaps, are they brought to market at two years old, in such perfection of weight and fatness.

The production of beef at the quickest and cheapest rate, being the object in view, the first requisite is a stock of cows possessing qualities suitable for this purpose. Accordingly, they should be good milkers—able to keep at the rate of two and a half to three calves each—of a kind known to have a tendency to fatten readily and to come early to maturity, and of a structure likely to produce a vigorous, well-grown steer. In other words they must be good Short-Horns; only having more regard to their milking properties than is usually done by breeders of bulls. And here it may be well to notice, that it is in general highly inexpedient for the beef-grower; the farmer who depends largely on his regular cast of fat cattle—to attempt breeding his own bull. It is only a few individuals in any district who have the taste and skill requisite for this difficult department of the business, not to mention the large capital which must necessarily be invested in it, the precariousness of the return, the greater liability to casualties of such high-bred animals, and the additional expense of there housing and maintenance. On Tweed-side, the breeding of bulls is confined to a limited number of persons, chiefly Northumbrians, who, by devoting their whole attention to this department, are able, from year to year, to furnish a class of bulls which are steadily improving the general breed of the district. The contrary practice is at this moment compromising the character of this valuable breed of cattle in several districts of Scotland, into which they have been more recently introduced. Wiser on this point by experience, the farmer of the Border purchases from some breeder of established reputation a good yearling bull, which he uses for two or three seasons, and then replaces by another in like manner. This bull serves his own cows and those of his kinds, and some of the neighbouring villagers', and thus though his own stud be limited to six or eight cows, he can select from the progeny of his own bull as many calves as he requires to make up his lot, and has them more uniform in color and quality than could otherwise be the case As the male parent, among sheep and cattle, is known to exert by far the greatest influence in giving character to the progeny, and increasingly so in proportion to the purity of his breeding, it is evidently much for the advantage of the beef-grower to spare no reasonable trouble and expense in obtaining a bull of thorough purity, and to select his calves with the most scrupulous attention. From overlooking all this, how often may cattle be seen, on the best of land too, which can only be fattened at an enormous expense of food and time, and after all, are so coarse in quality as to realize an inferior price per stone. Occasionally a few beasts of the right sort will be seen in such lots, which by going ahead of their fellows, to the extent of £4 or £5 a-piece of actual market value, show what might have been done by greater skill or attention on the part of the owner.

It is very desirable to have all the cows to calve betwixt the 1st February and April. If earlier, they will get almost dry ere the grass comes, and calves later than this will scarcely be fit for sale with the rest of the lot. When a calf is dropped, it is immediately removed from its dam, rubbed dry, with a coarse cloth or wisp of straw, (this being what the cow would do for it with her tongue, if allowed,) and then placed in a crib in the calf-house among dry straw, when it receives a portion of its *own mother's* first milk, which being of a purgative quality, is just what is needed by the young animal. For a fortnight, new milk is the only food suitable for it, and of this it should receive a liberal allowance thrice a-day; but means should now be used to train it to eat linseed-cake and sliced Swedish turnip; and the readiest way of doing so is to put a bit of cake into its mouth immediately after getting its milk, as it will then suck greedily at anything it can get hold of. By repeating this a few times, and placing a few pieces in its trough, it will usually take to this food freely, and, whenever this is the case, it should have as much as it can eat, that its allowance of milk may be diminished, to meet the necessities of the younger calves

which are coming in succession. This is of the greater imporance that it is always most desirable to avoid mixing anything with their milk by way of helping the quantity. When a substitute must be resorted to, oatmeal porridge mixed with the new milk is perhaps the best. Sago of late years has been much used for this purpose; but an English veterinary surgeon has recently expressed a very decided opinion that its use impairs the digestive powers of the animal and predisposes to disease. The sour smell invariably found in a calf-house, where porridge or jelly of any kind is mixed with the milk, is proof sufficient that indigestion is the consequence. An egg put into each calf's allowance, and mixed with the milk by stirring with the hand, is a good help and never does harm; but, with this exception, it is best to give the milk warm and unadulterated, however small the quantity, and, along with this, *dry* farinaceous food, turnips and hay, *ad libitum*. If more liquid is needed, a pail with water may be put within their reach, as this does not produce the bad effects of mixed milk. Indeed, in this, it is the best to keep as closely as possible to the natural arrangement according to which the calf takes its suck—at first frequently, and then at longer intervals, as it becomes able to eat of the same food as its dam.

The diet of the cow at this season is a matter of some consequence. Swedish turnips yield the richest milk, but it is too scanty, and calves fed on it are liable to inflammatory attacks. Globe turnips should, therefore, form their principal food during the spring months. Care must also be taken that they do not get too low in condition in the autumn and winter, and for this end it is well to put them dry *at least* three months before calving. Some may think this long; but, on a breeding farm, milk is little value at this season. The cows, when dry, are kept at less expense, and by this period of rest, their constitution is invigorated, greater justice done to the fœtus, now rapidly advancing to maturity, and so much more milk obtained after calving, when it is really valuable.

When the calves are from four to six weeks old, they are removed from their separate cribs to a house were several can be accommodated together, and have room to frisk about. So soon as the feeding-yards are cleared of the fat cattle, the calves are put into the most sheltered one, where they have still more room, and are gradually prepared for being turned out to grass; and, when this is done, they are brought in at night for some time. At six weeks old, the mid-day allowance of milk is discontinued, and at about fourteen weeks they are weaned altogether. When this is done, their allowance of linseed-cake is increased: and, as they have been trained to its use, they readily improve in condition. at this crisis, instead of having their growth checked, and acquiring the large belly and unthrifty appearance which used to be considered an unavoidable consequence of weaning. The cake is continued until they have so evidently taken with the grass as to be able to dispense with it. They are not allowed to lie out very late in autumn, but, as the nights begin to lengthen and get chilly, are brought in during the night, and receive a foddering of tares or clover foggage. When put on turnips, the daily allowance of cake, (say 1 lb. each) is resumed, and continued steadily through the winter and spring, unlil they are again turned to grass.—This not merely promotes their growth and feeding, but (so far as the experience of five or six years can determine the point) seems a specific against black-leg, which was often so fatal as altogether to deter many farmers from breeding. It may be well to state here distinctly the particular purpose for which cake is given at the different stages of their growth. At first, the object is to accustom them to a wholesome and nutritious diet, which will supplement the milk obtained from any given number of cows, so as to admit of a greater number of calves being reared, and at the same time, have greater justice done them than could otherwise be practicable at weaning-time, again, it is to help the young animal over the transition from milk to grass alone, without check to growth or loss of condition. During the following winter, however, the special object of its use is to prevent black-leg, as, but for this, turnips *ad libitum* would be sufficient.

When put to grass as year-olds, they decidedly thrive better on sown grass of the first year than on old pasture, differing in this respect from cattle whose growth is matured. They are laid on turnips again as early in the autumn as these are ready; and it is a good practice to sow a few acres of globes to be ready for this express purpose.

The details given above are a description of the expedients generally adopted by the breeders of this district for securing these objects.—*Jour. of High. and Ag. Soc. of Scot.*

Flooding Meadows.

Practice of Irrigation.—The first operation on the intended meadow is to free it thoroughly of water by draining. If springs exist, they should be cut off by drains of sufficient depth to reach the source of injury. But, in addition to this, the land, if the soil is clayey, or rests upon a tenacious subsoil, should be effectually furrow-drained, so as to afford a ready egress to the water underground. The land is then to be levelled and otherwise prepared. If it is already in old turf, it will be well to pare off the sward with the spade, and after having dug and prepared the ground, to replace the turf. In this manner the meadow will be ready for the reception of the water, as soon as it is formed. But should there be no turf upon the ground, or should this turf be felled with useless or innutritious plan , the land should be thoroughly worked, levelled, and otherwise prepared, and then sown with the suitable grass seeds. These grass-seeds may be sown in autumn. We cannot, however, in this case, admit the water during the first winter. We must retain the land in pasture for the whole of the following winter and summer, so that the young plants may establish themselves in the soil. But in the second winter we may generally admit the water. The ground may be in part prepared by the plow, and we may even economize expenditure by taking a crop of some kind before we begin to level and otherwise form the meadow ; but generally it is better to proceed at once with the formation of the meadow, and employ the spade in place of the plow for levelling and preparing the ground for the reception of the grass-seeds in autumn. Along the higher side of the meadow is first to be formed the main conductor, to which the water is carried, and from which it is conveyed over the surface of the meadow. The earth taken out of this trench is to be employed in banking it, and filling up hollows in the surface of the ground. The size of the main conductor must be proportioned to that of the meadow, and the quantity of water to be conveyed.

The next operation is, forming the main drain, at the lower part of the land to be flooded. It is of the same size as the main conductor, and the earth taken out of it is to be employed in banking or filling up hollows. The surface of the meadow, supposing it to be flat, is now to be formed into beds or planes, from 30 to 40 feet in width, extending from the main conductor to the main drain. These beds may be elevated about 12 inches at the centre ; they are not curved like the ridges of a plowed field, but form inclined planes from the centre to each side. At leaving the main conductor they may be 20 inches wide, gradually narrowing to nearly a point at their termination, when they reach the surface. If stops of solid earth are left, these may be 6 inches either way, with their diagonal in the line of the feeder, and such of them as are not required may be afterwards removed. The earth taken out of these feeders is to be employed in making good its own banks, and in levelling the inequalities of the surface. Coresponding with the feeders, and alternating with them, are to be formed the series of subordinate drains, communicating with the main drain. They are of the same demensions as the feeders, with this distinction, that they are widest and deepest where they communicate with the main drain, and become gradually smaller to the upper part of the meadow, where they terminate. The surface of the meadow being formed, the grass-seeds, where no turf has been reserved are to be sown. The following admixture of grasses will be found suitable :—1. Alpocurus pratensis—meadow foxtail : 2 Phleum pratense—meadow cat's-tail : 3. Agrostis alba—marsh bent grass ; 4 Poa pratesis—rough-stalked meadow-grass ; 5. Poa pratensis—smooth stalked meadow grass ; 6. Festuca loliacea—spiked fescue grass ; 7. Festuca pratensis—meadow fescue. When the old turf has been replaced, the water, it has been said, may be admitted in the first winter ; when grass-seed have been sown, the water cannot be admitted until the second winter, and sometimes even not till the third. The ground should be dispastured with sheep during the first summer to such a degree as to prevent the plants from putting forth their flowering stems and producing seeds.

The next point to be considered is the management of the meadow when completed. At the beginning of October, we are to prepare for admitting the water. To this end the drains and feeders are to be cleaned out, and the banks where injured repaired The main sluice is then to be withdrawn, when the conductors and feeders will be gradually filled. The next point is to adjust the water in the several feeders. To this end the workman is to observe that each feeder, beginning with the first in order, receives

a due quantity of water. If not, he enlarges the mouth so as to allow the proper quantity to enter. He then adjusts the tops in the several feeders, so that the whole surface of the beds shall be covered equally about an inch deep with water. During this and the three following months, namely, November, December and January—the ground is to be regularly flooded for 15 or 20 days at a time, with intermissions at each time of seven or eight days, during which the ground is to be laid perfectly dry. Farther, when severe frost is threatened, the water is in like manner to be withdrawn, so as that it may not freeze upon the surface. During this, the *principal periods of flooding*, the meadow is to be inspected every three or four days, to see that no interruption from the breaking of banks, accumulation of weeds, or otherwise, is given to the flowing of the water. When the spring months arrive, and grasses begin to grow, the periods of flooding are to be shortened. In the month of February the water should never be allowed to flow above six or seven days at a time, and in severe frosts it should be withdrawn, so that no ice may be formed upon the meadow.

The same management, shortening from five to six days the periods of flooding, may be continued till the middle of March, by which time the meadow will be ready for receiving any kind of stock. In this manner an early supply of herbage is obtained; and after the stock has been removed, as by the beginning of May the flooding may be resumed and continued till near the *end of the month, so as to prepare the meadow* for hay. But often this spring feeding is not resorted to. The irrigation is continued during the months of March, April, and until the middle of May, when it finally ceases. But during this period, the frequency and length of time of watering are gradually diminished from five or six days in March, to two or three in the latter period of flooding. Caution is required in flooding as the season advances; because, were the finer grasses to be too long submerged at this period of growth, they would be injured and destroyed. The actual periods of flooding differ with the state of the season and the nature of the soil. A practical rule adopted for irrigation is, never to continue to flood when a white scum is seen to form on the surface of the water, for this indicates that the putrefactive fermentation has commenced in the turf. By the middle of May, or rarely later, the flooding is to cease, and the land to be laid thoroughly dry. The grasses will now grow with great luxuriance, and produce an abundant crop of hay. When the hay is removed, the aftermath is depastured, after which the same process of flooding recommences. Sometimes, after the hay is removed, the ground is again flooded; but in this case, no sheep must be admitted on the flooded land, or, if admitted, they must be such sheep as are to be immediately killed; for this summer flooding never fails to bring with it the disease of rot in its most destructive form. In place of the meadow being applied to the production of hay, it may be applied to the production of green forage for soiling. This is a more profitable mode of applying the watered meadow than for the production of hay. Three crops, in this case, may be taken, the meadow being flooded after each crop is removed.—*Far. Mag.*

To Cure Galls in Horses.—W. B. Hamilton of Philadelphia, says—"Some twenty-five years since, an old stage driver told me the secret why, to the astonishment and envy of every other Jehu, his horses were never galled. Myself and friends have tested it again and again. Here it is. Gather a quantity of smart weed *(aqua piper)* which grows in almost every wet spot about the stable; bruise it well, and put it in an iron vessel, in a corner of the stable, cover it up with chamberley and wash the galled places whenever the horse enters or leaves the stable, or oftener, if occasion offers, and then the cure is almost immediate. If badly galled under the harness or collar, bruise well some of the leaves and bind on the spot. To prevent galling, let the shoulders and parts exposed, be washed daily with the infusion, and the animal will not gall, work him as hard as you will, provided the harness be good."—*Alb. Cult.*

New Acid for Dyeing.—Take of the root of the *aloe*, and by the action of *nitric* acid a beautiful red color is produced, which will be found very useful to dyers.

Astringent Mixture for Scours—Suet cut fine and boiled in new milk, in the proportion of one quarter of a pound to a pint of the milk. To this must be added of boiled starch, one pint; alum, in powder, one drachm. Given as a drench. Good both for horses and cattle.

The Diseases of the Horse.

BY WILLIAM YOUATT.

The principal diseases of the Horse are connected with the circulatory system. From the state of habitual excitement in which the animal is kept, in order to enable him to execute his task, the heart and the blood-vessels will often act too impetuously; the vital fluid will be hurried along too rapidly, either through the frame generally, or some particular part of it, and there will be *congestion*, accumulation of blood in that part, or *inflammation*, either local or general, disturbing the functions of some organ, or of the whole frame.

Congestion.—Take a young Horse on his first entrance into the stables; feed him somewhat highly, and what is the consequence? He has swellings of the legs, or inflammation of the joints, or perhaps of the lungs. Take a horse that has lived somewhat above his work, and gallop him to the top of his speed; his nervous system becomes highly excited; the heart beats with fearful rapidity; the blood is pumped into the lungs faster than they can discharge it; the pulmonary vessels become gorged, fatigued, and utterly powerless—the blood, arrested in its course, becomes vesid, and death speedily ensues. We have but one chance of saving our patient—the instantaneous and copious abstraction of blood; and only one means of preventing the recurrence of this dangerous state, namely, not suffering too great an accumulation of the sanguineous fluid by over feeding, and by regular and systematic exercise, which will inure the circulatory vessels to prompt and efficient action when they are suddenly called upon to exert themselves. The cause and the remedy are sufficiently plain.

Again, the brain has functions of the most important nature to discharge, and more blood flows through it than through any other portion of the fame of equal bulk. In order to prevent this organ from being oppressed by a too great determination of blood to it, the vessels, although numerous, are small, and pursue a very circuitous and winding course. If a horse highly fed, and full of blood, is suddenly and sharply exercised, the course of the blood is accelerated in every direction, and to the brain among other parts. The vessels that ramify on its surface or penetrate its substance are completely distended and gorged with it. Perhaps they are ruptured, and the effused blood presses upon the brain; it presses upon the origins of the nerves on which sensation and motion depend, and the animal suddenly drops powerless. A prompt and copious abstraction of blood, or, in other words, a diminution of this pressure, can alone save the patient. Here is the nature, the cause, and the treatment of *apoplexy*.

Sometimes this disease assumes a different form. The horse has not been performing more than his ordinary work, or perhaps he may not have been out of the stable. He is found with his head drooping and his vision impaired. He is staggering about. He falls, and lies half unconscious, or he struggles violently and dangerously. There is the same congestion of blood in the head, the same pressure on the nervous origins, but produced by a different cause. He has been accustomed habitually to overload his stomach, or he was, on the previous day, kept too long from his food, and then he fell ravenously upon it, and ate until his stomach was completely distended and unable to propel forward its accumulated contents. Thus distended, its blood-vessels are compressed, and the circulation through them is impeded or altogether suspended. The blood is still forced on by the heart, and driven in accumulated quantity to other organs, and to the brain among the rest; and there congestion takes place, as just described, and the animal becomes sleepy, unconscious, and, if he is not speedily relieved, he dies. This too is apoplexy; the horseman calls it *stomach staggers*. Its cause is improper feeding. The division of the hours of labor, and the introduction of the *nose-bag*, have much diminished the frequency of its occurrence. The remedies are plain,—bleeding, physicking, and the removal of the contents of the stomach by means of a pump contrived for that purpose.

Congestions of other kinds occasionally present themselves. It is no uncommon thing for the blood to loiter in the complicated vessels of the *liver*, until the covering of that viscus has burst, and an accumulation of coagulated black blood has presented itself. This congestion constitutes the *swelled legs* to which so many horses are subject when they stand too long idle in the stable, and it is the source of many of the accumulations of serous fluid in various parts of the body, and particularly in the chest, the abdomen, and the brain.

Inflammation is opposed to *congestion*, as consisting in an active state of the capillary arterial vessels; the blood rushes through them with far greater rapidity than in health, from the excited state of the nervous system by which they are supplied.

Inflammation is either *local* or *diffused*. It is confined to one organ, or to a particular portion of that organ; or it involves many neighboring ones, or it is spread over the whole frame. In the latter case it assumes the name of *fever*. Fever is general or constitutional inflammation, and it is said to be *sympathetic* or *symptomatic* when it can be traced to some local affection or cause, and *idiopathic* when we cannot so trace it. The truth probably is, that every fever has its local cause, but we have not a sufficient knowledge of the animal economy to discover that cause.

Inflammation may be considered with reference to the membranes which it attacks.

The *mucous membranes* line all the cavities that communicate with the external surface of the body. There is frequent inflammation of the membrane of the mouth. *Blain*, or *Glos-*

anthrax, is a vesicular enlargement which runs along the side of the tongue. Its cause is unknown. It should be lanced freely and deeply, and some aperient medicine administered — *Barbs*, or *paps*, are smaller enlargements, found more in the neighborhood of the bridle of the tongue. They should never be touched with any instrument; a little cooling medicine will generally remove them. *Lampas* is inflammation of the palate, or enlargement of the bars of the palate. The roof of the mouth may be slightly lanced, or a little aperient medicine administered: but the sensibility of the mouth should never be destroyed by the application of the heated iron. *Canker* and *wounds in the mouth* from various causes, will be best remedied by diluted tincture of myrrh, or a weak solution of alarm.

Foreign bodies in the gullet may generally be removed by means of the probang used in the hoove of cattle; or the œsophagus may be opened, and the obstructing body taken out.

It is on the mucous membranes that *poisons* principally exert their influence. The *yew* is the most frequent vegetable poison. The horse may be saved by timely recourse to equal parts of vinegar and water injected into the stomach, after the poison has been as much as possible removed by means of the stomach pump. For arsenic or corrosive sublimate there is rarely any antidote.

Spasmodic colic is too frequently produced by exposure to cold, or the drinking of cold water, or the use of too much green meat. The horse should be walked about, strong friction used over the belly, and spirit of turpentine given in doses of two ounces, with an ounce each of laudanum and spirit of nitrous ether, in warm water or ale. If the spasm is not soon relieved the animal should be bled, an aloetic ball administered, and injections of warm water with a solution of aloes thrown up. This spasmodic action of the bowels, when long continued, is liable to produce *intussusception*, or *entanglement*, of them, and the case is then hopeless.

Superpurgation often follows the administration of a too strong or improper dose of physic. The torture which it produces will be evident by the agonized expression of the countenance, and the frequent looking at the flanks. Plenty of thin starch or arrow-root should be given both by the mouth and by injection; and, twelve hours having passed without relief being experienced, cask, catechu, and opium should be added to the gruel.

Worms in the intestines are not often productive of much mischief, except they exist in very great quantities. Small doses of emetic tartar with a little ginger may be given to the horse half an hour before his first meal, in order to expel the round white worm; and injections of linseed-oil or aloes will usually remove the ascarides, or needle-worms.

The *respiratory passages* are all lined by the mucous membrane. *Catarrh*, or *cold*, inflammation of the upper air passages, should never be long neglected. A few mashes or a little medicine will usually remove it. If it is neglected, and occasionally in defiance of all treatment, it will degenerate into other diseases. The larynx may become the principal seat of inflammation. *Laryngitis* will be shown by extreme difficulty of breathing, accompanied by a strange roaring noise, and an evident enlargement and great tenderness of the larynx when felt externally. The windpipe must be opened in such case, and the best advice will be necessary. Sometimes the subdivisions of the trachea, before or when it first enters the lungs, will be the part affected, and we have *bronchitis*. This is characterized by a quick and hard breathing, and a peculiar wheezing sound, with the coughing up of mucus. Here, too, decisive measures must be adopted, and a skilful practitioner employed. His assistance is equally necessary in *distemper*, *influenza*, and *epidemic catarrh*, names indicating varieties of the same disease, and the product of atmospheric influence; differing to a certain degree in every season, but in all characterized by intense inflammation of the mucous surfaces, and rapid and utter prostration of strength, and in all demanding the abatement of that inflammation, and yet little expenditure of vital power.

Cough may degenerate into *inflammation of the lungs*; or this fearful malady may be developed without a single premonitory symptom, and prove fatal in twenty-four or even in twelve hours. It is mostly characterized by deathly coldness of the extremities, expansion of the nostril, redness of its lining membrane, singular anxious countenance, constant gazing at the flank, and an unwillingness to move. A successful treatment of such a case can be founded only on the most prompt and fearless and decisive measures. The lancet should be freely used. Counter-irritants should follow as soon as the violence of the disease is in the slightest degree abated; sedatives must succeed to them, and fortunate will he be who often saves his patient after all the decisive symptoms of pneumonia are once developed.

Among the consequences of these severe affections of the lungs are *chronic cough*, not always much diminishing the usefulness of the horse, but strangely aggravated at times by any fresh accession of catarrh, and too often degenerating into *thick wind* which always materially interferes with the speed of the horse, and in a great proportion of cases terminates in broken wind. It is rare indeed that either of these diseases admits of cure. That obstruction in some part of the respiratory canal, which varies in almost every horse, and produces the peculiar sound termed *roaring*, is also rarely removed.

Glanders, the most destructive of all diseases to which the horse is exposed, is the consequence of breathing the atmosphere of foul and vitiated stables. It is the winding up of almost every other disease, and in every stage it is most contagious. Its most prominent symptoms are a

small but constant discharge of sticky matter from the nose; an enlargement and induration of the glands beneath and within the lower jaw, on one or both sides, and, before the termination of the disease, chancrous inflammation of the nostril on the same side with the enlarged gland. Its contagiousness should never be forgotten, for if a glandered horse is once introduced into a stable almost every inhabitant of that stable will, sooner or later, become infected and die.

The urinary and genital organs are also lined by mucous membranes. The horse is subject to *inflammation of the kidneys* from eating musty oats or mowburnt hay, or from exposure to cold and injuries of the loins. Bleeding, physic, and counter irritants over the region of the loins should be had recourse to. *Diabetis*, or *profuse staling*, is difficult to treat. The inflammation that may exist should first be subdued; and then opium, catechu, and the uva ursi administered. *Inflammation of the bladder* will be best alleviated by mucilaginous drinks of almost any kind. *Inflammation of the neck of the bladder*, evinced by the frequent and painful discharge of small quantities of urine, will yield only to the abstraction of blood and the exhibition of opium. A catheter may be easily passed into the bladder of *the mare*, and the urine evacuated, but it will require a skilful veterinary surgeon to effect this in the horse. *A stone in the bladder* is readily detected by the practitioner, and may be extracted with comparative ease. The sheath of the penis is often diseased from the presence of corrosive mucous matter. This may easily be removed with warm soap and water.

To the mucous membranes belong the conjunctival tunic of the eye, and the diseases of the eye generally may be here considered. A *scabby itchiness* on the edge of the eyelid may be cured by a diluted nitrated ointment of mercury. *Warts* should be cut off with the scissors, and the roots touched with lunar caustic. *Inflammation of the haw* should be abated by the employment of cooling lotions, but that useful defence of the eye should never, if possible, be removed. Common *ophthoimia* will yield as readily to cooling applications as inflammation of the same organ in any other animal, but there is another species of inflammation, commencing in the same way as the first, and for a while apparently yielding to treatment, but which changes from eye to eye, and returns again and again, until blindness is produced in one or both organs of vision. The most frequent cause is hereditary predisposition. The reader cannot be too often reminded that the qualities of the sire, good or bad, descend, and scarcely changed, to his offspring. How *moon-blindness* was first produced no one knows; but its commonance in our stables is to be traced to this cause principally, or almost alone, and it pursues its course until cataract is produced, for which there is no remedy. *Gutta serena* (palsy of the optic nerve) is sometimes observed, and many have been deprived, for the eye retains its perfect transparency. Here, also, medical treatment is of no avail.

The serous membrane are of great importance. The brain and spinal marrow, with the origins of the nerves, are surrounded by them; so are the heart, the lungs, the intestinal canal, and the organs whose office it is to prepare the generative fluid.

Inflammation of the Brain.—Mad staggers fall under this division. It is inflammation of the meninges, or envelops of the brain, produced by over-exertion, or by any of the causes of general fever, and it is characterized by the wildest delirium. Nothing but the most profuse blood letting, active purgation, and blistering the head, will afford the slightest hope of success.—*Tetanus* or *locked jaw* is a constant spasm of all the voluntary muscles, and particularly those of the neck, the spine, and the head, arising from the injury of some nervous fibril—that injury spreading to the origin of the nerve—the brain becoming affected, and universal and unbroken spasmodic action being the result.—Bleeding, physicking, blistering the course of the spine, and the administration of opium in enormous doses, will alone give any chance of cure. *Epilepsy* is not a frequent disease in the Horse, but it seldom admits of cure. It is also very apt to return at the most distant and uncertain intervals. *Palsy* is the suspension of nervous power. It is usually confined to the hinder limbs, and sometimes to one limb only. Bleeding, physicking, antimonial medicines, and blistering of the spine, are most likely to produce a cure, but they too often utterly fail of success. *Rabies*, or madness, is evidently a disease of the nervous system, and, once being developed, is altogether without remedy. The utter destruction of the bitten part with the lunar caustic soon after the infliction of the wound, will, however, in a great majority of cases, prevent that development.

Pleurisy, or inflammation of the serous covering of the lungs and the lining of the cavity of the chest, is generally connected with inflammation of the substance of the lungs; but it occasionally exists independent of any state of those organs. The pulse is in this case hard and full, instead of being oppressed, the extremities are not so intensely cold as in pneumonia; the membrane of the nose is a little reddened, and the sides are tender. It is of importance to distinguish accurately between the two, because in pleurisy more active purgation may be pursued, and the effect of counter irritants will be greater from their proximity to the seat of disease. Copious bleedings and sedatives here also should be had recourse to. It is in connection with pleurisy that a serous fluid is effused in the chest, the existence and extent of which may be ascertained by the practiced ear, and which in many cases may be safely evacuated.

The heart is surrounded by a serous membrane, the pericardium, that secretes a fluid, the interposition of which prevents any injurious friction

or concussion in the constant action of this organ. If this fluid increases to a great degree, it constitutes *dropsy of the heart*, and the action of the heart may be impeded or destroyed. In an early stage it is difficult to detect, and in every stage difficult to cure.

The heart itself is often diseased; it sympathizes with the inflammatory affection of every organ, and, therefore, is itself occasionally inflamed. *Carditis*, or *inflammation of the heart*, is characterized by the strength of its pulsations, the tremor of which can be seen, and the sound can be heard at a distance of several yards.—Speedy and copious blood letting will afford the only hope of cure in such a case.

The outer coat of the stomach and intestines is composed of a serous membrane, the peritoneum, which adds strength and firmness to their textures, attaches and supports and confines them to their respective places, and secretes a fluid that prevents all injurious friction between them.—This coat is exceedingly subject to inflammation, which is somewhat gradual in its approach. The pulse is quickened, but small; the legs cold; the belly tender; there is constant pain, and every motion increases it; there is also rapid and great prostration of strength. These symptoms will sufficiently characterize *peritoneal inflammation*. Bleeding, aperient injections, and extensive counter irritation will afford the only hope of cure.

The time for *castration* varies according to the breed and destiny of the horse. On the farmer's colt it may be effected when the animal is not more than four or five months old, and it is comparatively seldom that a fatal case then occurs. For other horses, much depends on their growth, and particularly on the development of their fore quarters. Little improvement has been effected in the old mode of castrating, except the opening of the scrotum and the division of the cord by the knife, instead of the heated iron.

Synovial or *joint membranes* are interposed between the divisions of the bones, and frequently between the tendons, in order to secrete a certain fluid that shall facilitate motion and obviate friction. Occasionally the membrane is lacerated, and the synovia escapes. This is termed *opened joint*, and violent inflammation rapidly ensues. The duty of the practitioner is to close this opening as quickly as possible. Nothing is so effectual here as the application of the cautery. A great deal of inflammation and engorgement are produced around the opening, partially, if not altogether, closing it; or at least enabling the congulated synovia to occupy and obliterate it. Perhaps, in order to secure the desired result, the whole of the joint should be blistered. After this a bandage should be firmly applied, and kept on as long as it is wanted. If there is any secondary eruption of the synovia, the cautery must again be had recourse to.

The Navicular Disease is a bruise, or inflammation, or perhaps destruction, of the cartilage of the navicular bone, where the flexor tendon of the foot passes over it in order to reach the coffin-bone. The veterinary surgeon can alone ascertain the existence and proper treatment of this disease. *Spavin* is an enlargement of the inner side of the hock. The splint-bones support the inferior layer of those of the hock, and as they sustain a very unequal degree of concussion and weight, the cartilaginous substance which unites them to the shank-bone takes on inflammation. It becomes bony instead of cartilaginous, and the disposition of this change being set up in the part, bony matter continues to be deposited, until a very considerable enlargement takes place, known by the name of *spavin*, and there is considerable lameness in the hock-joint. The bony tumor is blistered, and probably fired, but there is no diminution of the lameness until the parts have adapted themselves, after a considerable process of time, to the altered duty required of them, and then the lameness materially diminishes, and the horse becomes, to a very considerable extent, useful. *Curb* is an enlargement of the back of the hock, three or four inches below its point. It is a strain of the ligament which there binds the tendons down in their place. The patient should be subjected to almost absolute rest; a blister should be applied over the back of the tumor, and, occasionally, firing will be requisite to complete the cure.—Near the fetlock, and where the tendons are exposed to injury from pressure or friction, little bags or sacks are placed, from which a lubricating mucous fluid constantly escapes. In the violent tasks which the horse occasionally has to perform, these become bruised and inflamed, and enlarged and hardened, and are termed *wind-galls*. They blemish the horse, but are no cause of lameness after the inflammation has subsided, unless they become very much enlarged. The cautery will then be the best cure. Immediately above the hock enlargements of a similar nature are sometimes found, and, as they project both inwardly and outwardly, they are termed *thorough-pins*. They are seldom a cause of lameness, but they indicate great and perhaps injurious exertion of the joint. On the inside of the hock a tumor of this kind, but of a more serious nature, is found. It is one of these enlarged mucous bags, but very deeply seated and the subcutaneous vein of the hock passing over it. The course of the blood through the vein is thus in some measure arrested, and a portion of the vessel becomes distended. This is a serious evil, since, from the deep-seatedness of the mucous bag, it is almost impossible to act effectually upon it. It is termed *bog* or *blood spavin*.

The cellular tissue which fills the interstices of the various organs, or enters into their texture, is the seat of many diseases. From the badness of the harness, or the brutality of the attendant, the poll of the horse becomes contused. Inflammation is set up, considerable swelling ensues.—An ulcerative process soon commences, and chasms and sinuses of the most frightful extent begin to be formed.

Farcy.—While the arterial capillaries are engaged in building up the frame, the absorbents are employed in removing that which is not only useless, but would be poisonous and destructive. They take up the matter of glanders and of every ulcerating surface, and they are occasionally irritated, inflamed and ulcerated from the acrimonious nature of the poison which they carry The absorbents are furnished with numerous valves. The fluid is for a while arrested by them, and there the inflammation is the greatest, and ulceration takes place. This is the history of the farcy cords and buds. Farcy is a highly contagious disease, whether or not it be connected with glanders. It, however, occasionally admits of cure from the application of the cautery to the buds, and the administration of the corrosive sublimate or the sulphate of iron internally

The skin of the Horse is subject to various diseases. Large pimples or lumps suddenly appear on it, and, after remaining a few days, the cuticle peels off, and a circular scaly spot is left This is called *surfeit*. The cause is obscure, but principally referable to indigestion. A slight bleeding will always be serviceable. Physic rarely does good, but alteratives composed of nitre, black antimony, and sulphur, will be very beneficial. *Mange* is a disease of a different character. It is the curse of the stable into which it enters, for it will almost certainly affect every horse.—Thorough dressings with Barbadoes tar and linseed oil, in the proportion of one of the former to three of the latter, will be the most effectual external application, while alteratives and physic should be given internally. *Hide-bound* is a very appropriate term for the peculiar sticking of the hide to the ribs when a horse is out of condition. The subcutaneous adipose matter is all absorbed. The alterative above recommended will be very useful here.

The legs, and the hind ones more than the fore ones, are subject to frequent and great and obstinate swellings, attended by great pain and considerable fever. It is acute inflammation of the cellular substance of the legs. Physic and diuretics, and tonics if there is the slightest appearance of debility, are the proper means of cure. Friction and bandages will also be useful occasionally. There is no disease in which the farrier and the groom do greater mischief than in this.

Grease is an undue secretion of the fluid which was designed to lubricate the skin of the heels, and that secretion is also altered in quality — The hind legs begin to swell—a fluid exudes from the heels—the hair of the heels become erect like so many bristles, and the skin of the heel is hot and greasy. Soon afterward cracks appear across the heel; they discharge a thick and offensive matter, and then deepen. They spread up the leg, and so does the tumefaction of the part. In process of time the skin, inflamed and ulcerated, undergoes an alteration of structure; prominences or granulations appear on it, resembling the appearance of a collection of grapes, or the skin of a pine-apple. They increase, and a fœtid discharge appears from the crevices between them.

The cause is generally neglect of the Horse He is suffered to stand in a stable with his heels cold and wet, which necessarily disposes them to inflammation and disease.

In the first stage of grease, bran or turnip or carrot poultices will be serviceable, with moderate physic. Then astringents must be employed, and the best are alum or sulphate of copper in powder, mixed with several times the quantity of Bole Armenian, and sprinkled on the sores—These should be alternated every three or four days The grapy heels are a disgrace to the stable in which they are found, and admit not of radical cure.

Splints are bony enlargements, generally on the inside of the leg, arising from undue pressure on the inner splint-bone, and this either caused by the natural conformation of the leg, or violent blows on it. These excrescences will often gradually disappear, or will yield to a simple operation, or to the application of the hydriodate of potash or blister ointments *Sprains*, if neglected, occasionally become very serious evils. Rest, warm fomentations, poultices, or, in bad cases, blistering, are the usual remedies. *Windgalls*, if they are of considerable size, or accompanied by much inflammation or lameness, will find in a blister the most effectual remedy. *Sprains of the fetlock* demand prompt and severe blistering. Nothing short of this will produce a permanent cure. *Sprains of the pastern and coffin joints* demand still more prompt and decisive treatment. If neglected or inefficiently managed, the neighboring ligaments will be involved, more extensive inflammation will be set up, and bony matter, under the name of *ring-bone*, will spread over the pasterns and cartilages of the foot. Firing alone will, in the majority of cases, be efficient here.

Inflammation of the foot, or acute founder In speaking of the structure of the foot, the laminæ, or fleshy plates on the front and sides of the coffin-bone, were described. From over-exertion or undue exposure to cold or wet, or sudden change from cold to heat, inflammation of these laminæ is apt to occur, and a dreadfully painful disease it is. It is easily detected by the heat of the feet, and the torture which is produced by the slightest touch of the hammer. The shoe must be removed, the sole well pared out, plentiful bleeding from the toe had recourse to, the feet well poulticed, and cooling medicines resorted to. The bleeding should be repeated if manifest benefit is not produced, and clothes dipped in decoction of lime, which are colder than the common poultice, should be substituted. After this a poultice around the foot and pastern should succeed Little food should be given, and that must consist of green meat and mashes.

Pumiced Feet—This is one of the consequences of inflamed feet. The sole of the foot becomes flattened, or even convex, by the pressure of the weight above. There is no cure but

and the only palliation of the evil is obtained from the application of a shoe so bevelled off from the crust that it shall not press upon or touch the sole. This, however, is only a temporary palliation, for the sole will continue to project, and the horse will be useless.

Contracted Feet.—By this is meant an increase in the length of the foot, and a gradual narrowing as the heels are approached; and as the necessary consequence of this, a diminution of the width of the foot and a convavity of the sole In point of fact, the whole of the foot, including the coffin-bone, becomes narrowed, and consequently elongated. This change of form is accompanied by considerable pain; the action of the horse is altered; there is a shortened tread, and a hesitating way of putting the foot to the ground.

The frog and heel would expand when the weight of the horse descends and is thrown upon them, but the nailing of the shoe at the heels prevents it. Thence the pain and lameness. Mr. Turner of Regent-street obviates this by a very simple method. He puts four or five nails in the shoe on the outside, and only two on the inside. There is then sufficient room for the natural expansion to take place, and the foot and action of the horse are little or not at all changed. This is an admirable contrivance, and recourse should always be had to it.

The Navicular Joint Disease.—There are many horses with open and well-formed feet that are lame. In every motion of the foot there is a great deal of action between the navicular bone and the flexor tendon which passes over it in order to be inserted into the navicular bone.—From concussion or violent motion, the membrane or the cartilage which covers the navicular bone is bruised or abraded, the horse becomes lame, and often continues so for life. This disease admits of remedy to a very considerable extent; no one, however, but a skilful veterinary surgeon is capable of successfully undertaking it.

Sand-crack is a division of the crust of the hoof from the upper part of it downward. It bespeaks brittleness of the foot, and often arises from a single false step. If the crack has not penetrated through the horn, it must nevertheless be pared fairly out, and generally a coating of pitch should be bound round the foot. If the crack has reached the quick, that *must* be done which ought to be done in every case—a skilful surgeon should be consulted, otherwise false quarter may ensue.

False Quarter is a division of *the ligament* by which the crust is secreted. It is one of the varieties of sand-crack, and exceedingly difficult to cure.

Tread or Overreach is a clumsy habit of setting one foot upon or bruising the other. It should immediately and carefully be attended to, or a bad case of *quittor* may ensue.

Quittor is the formation of little pipes between the crust and the hoof, by means of which the purulent matter secreted from some wound beneath the crust makes its escape. The healing of this, and of every species of *prick* or *wound* in the sole or crust, is often exceedingly difficult.

Corns are said to exist when the posterior part of the foot between the external crust and the bars is unnaturally contracted and becomes inflamed. Corns are the consequence of continued and unnatural pressure. The thorough cure of corns will put the ingenuity of the operator to the trial.

Thrush is the consequence of unnatural pressure on the frog. It is the cause and the effect of contraction, whether it is found in the heels of the fore feet or the hinder ones. It is not difficult to cure when taken in time, but when neglected it often becomes a very serious matter.

Canker is the consequence of thrush, or, indeed, of almost every disease of the foot. It is attended by a greater or less separation of horn, which sometimes leaves the whole of the sole bare. This, also, like the diseases of the foot generally, is difficult of cure.

Few things are more neglected, and yet of greater importance to the comfort and durability of the horse, than a proper system of *shoeing*. It is necessary that the foot should be defended from the wear and tear of the roads, but that very defence too often entails on the animal a degree of injury and suffering scarcely credible. The shoe is fixed to the foot, and often interferes with and limits the beautiful expansibility of that organ, and thus causes much unnecessary concussion and mischief.

The shoe of a healthy foot should offer a perfectly flat surface to the ground. The bearing or weight of the horse will then be diffused over the surface of the shoe, and there will be no injurious accumulation of it on different points. Too often, however, there is a convexity toward the inner edge, which causes an inequality of bearing, and breaks and destroys the crust. Round the outer edge of the shoe, and extended over two-thirds of it on the lower surface, a groove is sunk, through which pass the nails for the fastening of the shoe. At first they somewhat project, but they are soon worn down to the level of the shoe, which in the healthy foot should not vary from the heel to the toe.

The width of the shoe will depend on that of the foot. The general rule is that it should protect the sole from injury, and be as wide at the heel as the frog will permit.

The upper surface of the shoe should be differently formed. It should be flat along the upper end, outer supporting the crust, or, in other words, the weight of the horse, and widest at the heel, so as to meet and withstand the shock of the bars and crust. The inner portion of the shoe should be bevelled off, in order that in the descent of the sole, that part of the foot may not be bruised. The owner of the horse should occasionally be present when the shoes are removed, and he will be too often surprised to see how far the smith, almost wilfully, deviates from the right

construction of this apparently simple apparatus. The bevelled shoe is a little more troublesome to make and to apply than that which is often used by the village smith, but it will be the owner's fault if his directions are not implicitly obeyed.

Even at the commencement of the operation of shoeing, the eye of the master or the trustworthy groom will be requisite. The shoe is often torn from the foot in a most violent and cruel way. Scarcely half the clenches are raised when the smith seizes the shoe with his pincers and forcibly wrenches it off. The shrinking of the horse will tell how much he suffers, and the fragments of the crust will also afford sufficient proofs of the mischief that has been done, especially when it is recollected that every nail-hole is enlarged by this brutal force, and the future safety of the shoe to a greater or less degree weakened, and pieces of the nail are sometimes left in the substance of the crust, which become the cause of future disease.

In the paring out of the foot, also, there is frequently great mischief done. The formidable *butteris* is still often found in the smithy of the country farrier, although it is banished from the practice of every respectable operator. A worse evil, however, remains. By the butteris much of the sole was injuriously removed, and the foot was occasionally weakened, but the *drawing-knife* frequently left a portion of sole sufficient to destroy the elasticity of the foot, and to lay the foundation for contraction, corns and permanent lameness. One object, then, of the looker-on is to ascertain the actual state of the foot. On the descent of the crust, when the foot is placed on the ground, depends the elasticity and healthy state of the foot, and that may be satisfactorily determined by the yielding of the sole, although to a very slight degree, when it is strongly pressed upon with the thumb. The sole being pared out, the crust on each side may be lowered, but never reduced to a level with the sole, otherwise this portion will be exposed to continual injury.

The heels often suffer considerably from the carelessness or ignorance of the smith. The weight of the horse is not thrown equably on them, but considerably more on the inner than the outer quarter. The consequence of this is that the inner heel is worn down more than the outer, and the foundation is laid for tenderness and ulceration. The smith is too often inattentive to this, and pares away an equal quantity of horn from the inner and outer heel, leaving the former weaker and lower, and less able to support the weight thrown upon it.

Mention has already been made of the use of the *bars* in admitting and yet limiting to its proper extent the expansion of the foot. The smith in the majority of country forges, and in too many of those that disgrace the metropolis, seems to have waged interminable war with these portions of the foot, and avails himself of every opportunity to pare them down, or perfectly destroy them, forgetting, or never having learned, that the destruction of the bars necessarily leads to contraction by removing the chief impediment to it.

The horn between the crust and the bar should be well pared out. Every one accustomed to horses must have observed the great relief that is given to the horse with corns when this angle is pared out, and yet from some fatality, the smith rarely leaves it where Nature placed it, but cuts away every portion of it.

The true function of the frog is easily understood. It gives security to the tread, and contributes expansion to the heels, but the smith, although these cases come before him every day, seems to be quite unaware of the course which he should pursue, and either leaves the frog almost untouched, and then it becomes bruised and injured, and he pares it away so that it cannot come into contact with the ground, and consequently is not enabled to do its duty.

The owner of the horse will therefore find it his interest occasionally to visit the forge, and guided by the simple principles which have been stated, he will seldom err in his opinion of what is going forward there. He should impress two principles deeply on his mind, that a great deal more depends on the paring out of the foot than in the construction of the shoe; that few shoes, except they press upon the sole, or are made shamefully bad, will lame the horse, but they may be very easily lamed by an ignorant or improper paring out of the foot.

Where the owner of the horse has sufficient influence with the smith, he will find it advisable always to have a few sets of shoes ready made. Much time will be saved, in case of accident, and there will not be, as is too often the case, the cutting and paring and injuring of the foot, in order to make it fit the shoe. More injury than would be readily believed is done to the foot by contriving to get on it too small a shoe.

Cure for Scab in Sheep.—This troublesome disease was quite prevalent in our vicinity last year, but has been pretty much subdued. We have seen but one or two during the winter that were infected with it. Many of the poorer kinds of sheep that had it were killed off in the fall, and the remainder were treated in various ways. A flock belonging to Mr George King, and another to Mr. Tinkham of Monmouth, were cured by the following process: In November the diseased sheep were collected together. Thirteen pounds of tobacco, and a bushel and a half of poke root, (*veratrum viride* of botanists) were boiled up together, and water enough applied to fill nearly half a hogshead. The sheep were each *soused* into this liquor and thoroughly washed, and afterwards laid upon an inclined board or gutter, and the superabundant wash squeezed out of their wool. This completely cured them.—*Me. Far.*

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WM. McKINLAY.

West Flamboro' C. W.,
May 28, 1846.

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To persons at a distance we would recommend to procure their Fruit Trees in the Fall, more particularly where the soil is dry and warm: October and November, immediately after the cold weather has arrested vegetation, is esteemed the best season of all for transplanting Trees. When Trees are transplanted in Autumn, the earth becomes consolidated at their roots, and they are ready to vegetate with the first advancement of spring.

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C. BEADLE.

St. Catharines, January 1st, 1846.

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