

does not come within the scope of this paper, its main object being to ascertain whether the landowners of Scotland, as a body, have deserved the censures which have been vented upon them. Those who may take the trouble of dispassionately weighing what is stated in these pages, will, I think, scarcely answer this question in the affirmative. It is true that they have placed their chief reliance on those means by which the productive powers of the country are increased, and the industrious labourer is enabled to maintain those who have a natural claim on him for support. But the artificial provision for the wants of the indigent has also had a large share of their attention; and, as in their efforts to promote other improvements throughout the country, they have ransacked the whole world for information, so in studying the difficult subject of pauper management, they will gladly avail themselves of every assistance within their reach. The opinions of such men as the Poor Law Commissioners of England, they must hold in the greatest respect. But still it must be remembered, that the commissioners are strangers to Scotland, and that they are devoted to their own theory; and, although many portions of their plans may merit our adoption, the Scottish proprietors must stand excused for retaining to themselves the power of making their own selection.

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AGRICULTURIST'S NOTE-BOOK.—NO. XVII.

*Securing a Crop of Carrots.* By Mr JAMES BROWN.—*Daucus Carota* (Lin.) belongs to the class and order *Pentandria Digynia*, and natural order *Umbellifera*,—is a native of Britain, and found in light sandy pastures and in waste dry places in almost every part of the kingdom. The effects of cultivation have entirely altered the appearance of its root, which is the part used. In its natural state, the carrot is small, hard, and dry, of a white colour and strong flavour. In its cultivated state, the root becomes large, succulent, and of a red or yellowish colour.

We have no certain information respecting the precise time when carrots were first cultivated in this country; but Hume the historian says, that, in the time of Henry the Eighth,

“neither sallads, carrots, turnips, nor any other edible roots, were produced in England.” Previous to that time, these vegetables were imported from Holland and Flanders. That the cultivated varieties of the carrot did not originate in this country is pretty evident from the above quotation.

The leaves of carrots were held in esteem by the ladies of the gay court of Charles the First; for Parkinson, who was the botanic gardener of that monarch, informs us that they wore them instead of feathers.

The carrot is cultivated not only for the use of the kitchen, but also extensively, in many parts of the country, for the feeding of cattle; and it is found to be more nutritious than either turnips or cabbages. It is extensively grown upon the continent of Europe, for the use of horses, where it appears to be more valued than it is in this country. At the present time, it is rare to see a crop of clean, well-grown carrots in any garden of this country; while, upon the other hand, they are often seen to thrive well under the management of the farmer in the open fields. It is therefore principally to gardeners and cottars that I wish to address myself in what follows. It may also be useful to the farmer in so far as he cultivates this root for his own private use; for, even where agriculturists do not grow the carrot in the open field for the use of their cattle, how often have they been heard to express a wish that they could manage to grow it in their garden for the use of their own household? Such men are well aware that carrots generally grow perfectly well in the fields, but not being in the habit of growing them in the fields as a regular crop, they find it inconvenient to adapt any certain spot in the field for such a purpose; and having a part of their ground laid aside for kitchen cropping in a general way, they feel disappointed that they are unable, generally speaking, to grow carrots so easily as they can cabbages, turnips, and other such crops. The disappointment is indeed great, but by industry, the one crop is as much to be depended upon as the other; and I hope soon to see the cottar as good a grower of carrots as the first-rate gardener.

It is well known to all country people who have the advantage of cultivating their own little garden, that the carrot

is very apt to be injured, and often entirely destroyed while young, by small worms eating and gnawing the roots, particularly when they grow in a soil having been long under cultivation, as gardens generally are. Let it be understood, that I only address myself to those who cultivate ground having been repeatedly saturated with manure; for to go through the process which I wish to recommend, would be superfluous in new ground, unless we may except trenching, which is commendable in all cases. Here it will naturally occur to those who are unacquainted with the culture of the carrot, that its being a native of this country and growing wild along almost every hedge side, should render it the more hardy and easy of cultivation. The contrary is the truth. The effects of cultivation have rendered its parts more sensitive, and upon that very account, it is the more susceptible of injury when under bad culture. As a proof of this assertion, we will observe as follows:—

Beet, although a native of the south of Europe, is seldom, if ever, found to go back, or be attacked by vermin in the root, as the carrot is. On the contrary, it is in every respect easier to cultivate than the carrot, although it is not a native of this country.

The red-beet often forms as extensive a part of the kitchen-garden crop as the carrot does, particularly with gardeners, and yet, so far as my own experience goes, I have never found the beet go back, or fail to do well; while, at the same time, I have seen an extensive plot of carrots entirely fail upon the same piece of ground with the beet, and under the same management in every respect.

Now, why is it that the beet, being a native of the south of Europe, is surer and easier of culture than the carrot, which is a native of Britain? The reason is quite obvious, and may be accounted for upon the following considerations. The root of the carrot, in its natural state, as was before observed, is of a tough or woody texture, while, in its cultivated state, it has become succulent and fleshy; consequently the nature of the root is altogether changed. Who, upon seeing that wild weed commonly called bird's nest, would take it to be the true carrot? It is nevertheless true. The beet, on the other hand,

in its cultivated state, is little different from the same plant in the natural state. No doubt it will be large or small, according to the soil in which it is grown; but, at the same time, its natural good qualities are not improved by being overgrown, while those of the carrot are increased when overgrown.

Upon the shores of the Mediterranean, the beet is found as good in quality when in its natural state as in the cultivated garden. Here, now, we have the desired point. The beet succeeds well, because its primitive parts are not changed in a state of cultivation; while, upon the other hand, the carrot is exceedingly liable to be injured by bad culture, because its primitive parts are altogether changed in a cultivated state; therefore it is that the nature of the carrot requires to be studied before we can arrive at a safe and sure mode of culture. Indeed, every part of artificial work comes under the same rule; for the more complicated the parts of any machine are, the more liable it is to be deranged, and, consequently, the more skill and attention are required from the workman to keep it in proper tone.

Having thus briefly attempted to point out the nature and origin of the carrot, and stated that it is owing to its primitive parts being changed under the hands of the cultivator, that we must attribute its liability to decay and accident, when the soil in which it grows is not in a state congenial to its nature. And let it be observed, that every plant which we cultivate, whether as ornamental or useful, has a natural tendency to degenerate or fall back into its primitive state, or, perhaps, to be cut off altogether, if we neglect to observe its dispositions and requirements. As the principal intention of what I am writing is to give a system of culture, by which the carrot may be grown quite free from injury by the worm—at least I have, by the same method, grown them myself, where old and experienced gardeners have failed to produce the same—I will now commence here and give the whole according to the course of my own experience, by which I hope clearly to define the principles of the system I wish to recommend.

At Mount Melville, in Fifeshire, where I served my apprenticeship to the gardener profession, the garden was quite new;

indeed, the first year that I entered as apprentice, we were engaged in trenching, draining, and levelling the whole. The soil of which the garden was composed was between clay and brown loam, and rested principally upon a clay bottom.

The first year that the garden was put under crop, the carrots were sown upon a piece of ground which had been partly forced to the depth of 2 feet in the act of levelling the garden, and the sort sown was the Altringham; which sort is, in my opinion, the best for general use.

About the middle of the month of August in that year I took a tour through the neighbouring gentlemen's gardens (as is customary among gardeners), for the purpose of collecting information among those of the same craft with myself, and also to compare the progress of the crops in each garden I visited with those of the one in which I served. In each garden that I visited, I particularly remarked that their carrot crops looked ill; at least I considered that they all appeared so when compared with our carrot crop at Mount Melville.

When I got home, I inquired the reason at the gardener, why our carrot crop, above all other things I had seen, was superior to that of our neighbours. He answered me as follows:—

“All those gardens which you have visited to-day are old, and have been long under cultivation. Now, ground which has been long cultivated and much saturated with manure is not in a proper state for the growing of carrots to any degree of perfection. Upon the other hand, you will observe that our garden is entirely new, and only put under garden culture this year for the first time. This spot,” he continued, “where our kitchen-garden now is, has, I suppose, been under pasture these fifty years past. Now, perhaps those old gardens which you have visited to-day have lain the same number of years under kitchen cropping, and which cropping unavoidably requires the continual application of manure to stimulate the soil. Again, where ground is so much manured, it becomes what is termed foul; that is, along with the great quantity of dung used in garden cropping, insects in every stage of their being, and particularly in their egg state, enter, and, consequently, are dug into the soil along with the dung. Now these through

time multiply so extraordinarily, that they attack the roots of plants in general which grow in the soil ; and they appear to be particularly fond of the root of the carrot, as it is of a fleshy soft nature, and without any outer skin hard enough to repel their attacks.

“ You see that our garden has not yet undergone these repeated manurings, and is therefore at present what is termed clean ground, or new soil ; or, more properly, it is not yet adulterated with any foreign particles not naturally belonging to itself. Now, that I consider to be the reason why our carrot crop is at present superior to that of our neighbours.”

In the same manner, I collected information in the different places where I acted as journeyman ; but in all the places where I acted as assistant-gardener, after leaving Mount Melville, and where, of course, I had the opportunity of seeing the different methods practised by the different gardeners who had the management, I could not say that ever I saw a good crop of carrots, the reason being, as I have already assigned, all these gardens being old, and that of Mount Melville being new. I no doubt saw, where the ground had been trenched, a few things resembling carrots, but none that could be called good of their kind.

Therefore, from the experience I collected during my journeymanhip, I found that, in general, gardeners were unable to raise carrots in ground having been long under cultivation. I pondered upon the same in my own mind, and determined trying a system for myself as soon as I had an opportunity of putting it into practice. When I went to Craigton, the seat of Henry Dunlop, Esq., which was the first place I had upon my own account as gardener, I inquired if they had had good crops of carrots formerly in the garden. I was told they had not ; and the garden being an old one, I naturally anticipated the answer to my question. I was told that they had a few at times among the onions. As to the truth of what I have asserted, I may add, that when I went to the place in the month of November, there was not one carrot about it ; and I had to buy a supply for the use of the family during that winter. I may also here state, upon the authority of Mr Dunlop himself, that he had not hitherto seen

good carrots in the garden. I thought myself rather fortunate in this instance, as I hoped to have the credit of producing a supply of that vegetable without being obliged to neighbours, which is always a disagreeable circumstance.

Upon examining the ground in the garden, and having pitched upon a spot for my carrot crop the following season, I immediately set about preparing the same according to the method I had in view; and before I enter into detail of that method, I may say a few words relative to what led me to it. I had always observed, that the vermin which attacked the carrot were for the greater part near the surface of the ground; that is, my experience led me to think, that they, the insects, required to be near the surface before they could come into life, so far as to act upon the plants that grew in the ground for food to themselves. Upon examination, I found very few of the live insects nearer the surface of the ground than eight inches; therefore I concluded that the eggs of the insects required to have the influence of both air and sun before they came into life, although I make no doubt that the eggs lying dormant at a greater depth may keep their principles of life for many years, and afterwards come into life when exposed to the influence of heat and the action of the air. From these observations, which I had made from real experience, I concluded, that the usual system of trenching the ground for carrots, as a means of renewing the soil, was useless, because the insects, although buried in a great measure in the act of trenching the ground, had still the power of bringing themselves to the surface when their proper season of life came, when nothing else but the open soil, which is open and porous, was above them. For a proof of what I here assert, only witness the many failures of carrot culture after trenching the ground in the common manner. The insects cannot be said to be buried in the common way of trenching, they are only mixed through the soil, instead of being all upon the surface. Now, what I aimed at, was to have the ground trenched in such a manner as to have the upper nine inches of the soil, in which the insects lie, so buried in the bottom of the trench, as to have no connection with the newer part of the soil put above it in the act of trenching, and this I did in the following man-

ner :—The piece of ground which I pitched upon for the operation of trenching for carrot ground, was rather of a stiff nature, and at the same time I found that it was in need of draining. I commenced about the first of December, and drained the piece so far as I found necessary. Draining is a particular point to be attended to in the culture of carrots; the soil in which they grow ought always to be in a dry sweet state, else, however well the ground may be otherwise prepared, if not dry, the crop will not succeed well.

The draining being finished, I commenced trenching in the following manner :—I took out an opening all along the one end of the plot, wheeled and laid down the same opening taken out, at the opposite end, for the purpose of finishing; this opening I made 3 feet wide, and 2 feet deep; next I marked off another trench of the same breadth with the first and parallel to it.

This done, I dug up the top spit of the second trench, and flung it into the bottom of the first opening, and at the same time I shovelled clean up the loose earth left behind the spade in the act of taking off the top spit, and threw it also into the bottom of the first. This I levelled in the bottom of the opening, and after I had done so, I went into the opening and trode or trampled with my feet over the whole, making it firm and compact. Thus I had now, as I considered, the whole body of the soil in which the insects lived on the second trench in the bottom of the first; and this treading which I gave it in the bottom, rendered it not easily disturbed in after work upon the ground. I now measured the depth of the top spit which I had taken off the second trench, and found the same to average nearly 10 inches, while the same being trodden in the bottom of the first, was compressed by the treading to about 6 inches. Now, the earth put in the bottom of the first trench or opening being trodden level and firm as a barn-floor, I next wheeled in from the outer garden a compound which I had previously prepared for the purpose. The compound consisted of unslaked or powder-lime, two-thirds; and of pure river-sand, one-third, properly mixed together; of this compound, I put into the bottom of the first trench, and above (which is the same thing), the trodden earth, one inch in depth.



This I spread very evenly and equally all over. I now required to be extremely cautious in putting the rest of the soil above this compound, so as not to disturb or displace the same ; this I managed to do by breaking pretty fine some of the soil before I put it in. I broke it finely, and put it above the compound cautiously, about 2 inches thick ; then I had the liberty of throwing in the rest of the earth above this as I would, without any danger of displacing the compound. I now turned over the rest of the trench to the desired depth, that is, 2 feet ; and in the same manner I went over the whole piece of ground until I had it all trenched, always putting in the compound above the trodden earth in the bottom of the trench ; and when I had all trenched, I scattered over the level surface of the ground nearly three quarters of an inch of the former compound, and this I dug into the newly turned up soil, and exposed the same soil to the frost of winter, by repeatedly digging and presenting a new surface to the weather, while I had the opportunity of frosty weather. Now, I was perfectly aware that I had the vermin imprisoned in a manner for ever at least so long as the compound above them remained undisturbed, for my idea was, that the damp of the earth above the layer of lime and sand would soon form the same into a hard crust, through which the air could not penetrate, and consequently, through which the insects could not rise to the surface.

I here beg to be properly understood. I do not mean that the ground thus operated upon is now to be clean from vermin ever after ; no, every intelligent man will see the contrary. If the ground were to remain clean after this, it would as well remain clean in its own natural state, without any trouble of ours. I have already observed, that any piece of ground or plant, ornamental or useful, if left to nature's laws, will eventually fall into its primitive natural state. When the ground thus acted upon, in the manner I have pointed out, is put under some other crop, and the carrots taken off, consequently dung is given to it, then, in a few years, that new surface becomes old, and unfit for our present purpose. But, supposing a whole garden to be gone on with in this manner, piece by piece, year after year, might not the piece which had lain for a few years be again in a proper state to turn up for

growing carrot, and thus a continual round may be kept up, and also do good to the garden for the other crops? This I have not yet proved, neither can I say how long the insects will live when buried in the ground. Men of learning may be able to solve this matter; for my part I cannot. I can only speak from experience, which is the best schoolmaster. However, if we could properly ascertain the length of the life of these vermin which destroy the carrot, another new era in their culture might take place.

In the month of April I pointed over, or slightly dug, the ground previously prepared for the carrot crop, choosing a dry day, and the ground in good dry order. The ground being dug, I drew shallow drills about an inch deep, and 18 inches separate. In these drills I sowed, rather thinly than otherwise, the seed of the Altringham carrot. I covered the same with the rake, and over all I gave a slight beat with the back of the spade, meant to answer the purpose of the roller. I now watched the result anxiously, for although I was pretty well convinced in my own mind that they would do well, yet, my credit in a certain degree depended upon the same. When the young plants were about 3 inches in height, I thinned them out to about 4 inches apart from plant to plant, choosing a damp day for the operation; for, let it be observed, it is always most proper to thin carrots in dull weather, and if they be thinned in the time of rain, the result will be the more certain. I have known carrots die under the first strong sun after thinning; they being thinned in dry weather, and the ground being left open about their roots, the strong heat quite dried them up. But to proceed, the crop of carrots now under our notice grew rapidly after the process of thinning, and about the end of October I had a crop of carrots not equalled in that part of the country. I had indeed seen larger roots, but as a general crop they were allowed to be excellent. There was no mark of worm or rust upon them, and I had above all the pleasant satisfaction of presenting my employer with a crop the equal of which (to use his own words), he had not hitherto seen in his garden.

The next crop that I raised was at Craigston, in the county of Aberdeen, where Mr Urquhart, the proprietor of the place,

was well satisfied that I had raised a crop in his garden by the same method, and also in an old garden where they seldom or never had carrots for the use of the family before I went there ; which I learned from an old gardener who had acted in that capacity at Craigston for upwards of fifty years.

The next place where I had my method put in execution, was at Dunskey, the seat of Colonel Hunter Blair, where the garden was also an old one, much the same in that respect as I had been in formerly. In this garden I also raised excellent carrots, and the truth is, that I always had good crops, where others had failed in raising any thing resembling carrots, and this I always learned from the gardener who had acted in the same places before me. I now felt convinced of the utility of the system I had adopted. I have found it answer the desired end, namely, that of raising good carrot in old cultivated ground.

In these pages I hope that I have explained the method so as to be intelligible to every one, which is all I want. Those who have a better method of their own need not disregard the one I have pointed out ; it is a humble attempt to render myself useful to those who have not a better method of their own.

*The Farmer's Lawyer.\**—Manuals of law, like other compendiums, form a useful class of compilations, and have, of late years, met with a peculiarly favourable reception from the public. Indeed, from the many valuable publications of this description which have recently appeared, what was formerly no inconsiderable desideratum, has been in a great measure supplied, namely, the means of obtaining, to a certain extent, a popular knowledge of the legal rights and obligations to which individuals are entitled or subjected. Men of every class are interested in such affairs, and during the course of their ordinary avocations, come into continual contact with matters of law. Innumerable instances might be adduced where the slightest smattering of legal knowledge might have preserved individuals from irremediable embarrassments, or se-

\* *The Farmer's Lawyer*, being a Manual of the Law of Scotland in relation to Agricultural subjects.—Edinburgh Printing Company, 1841.