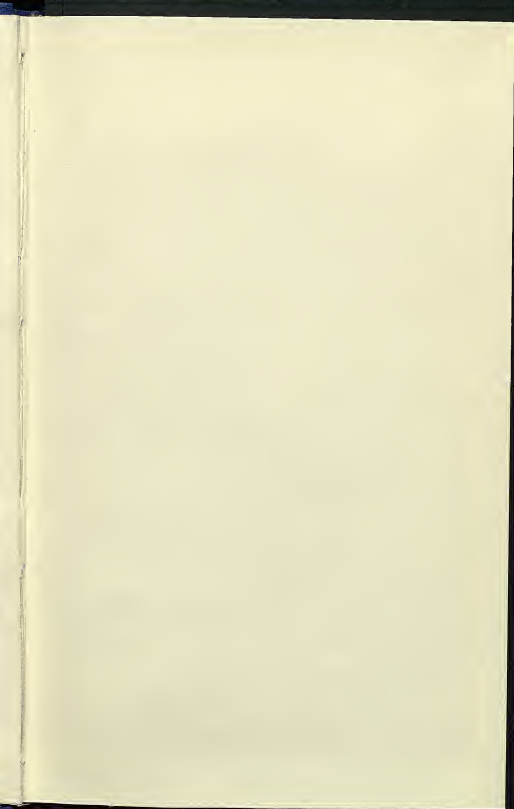
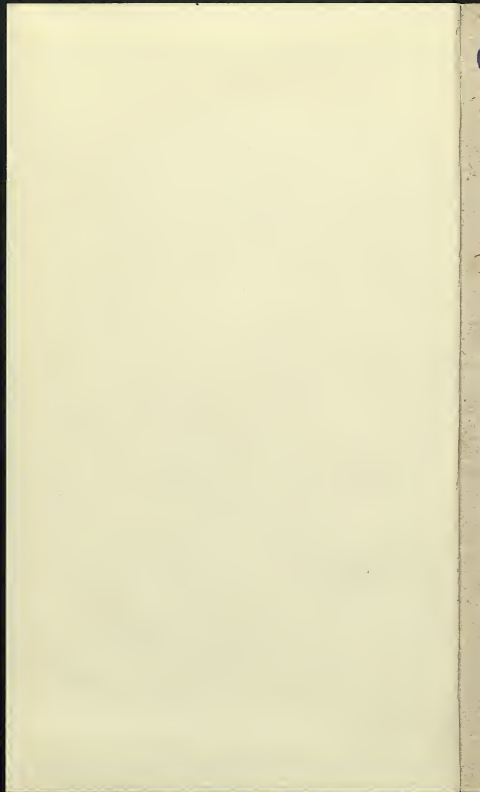




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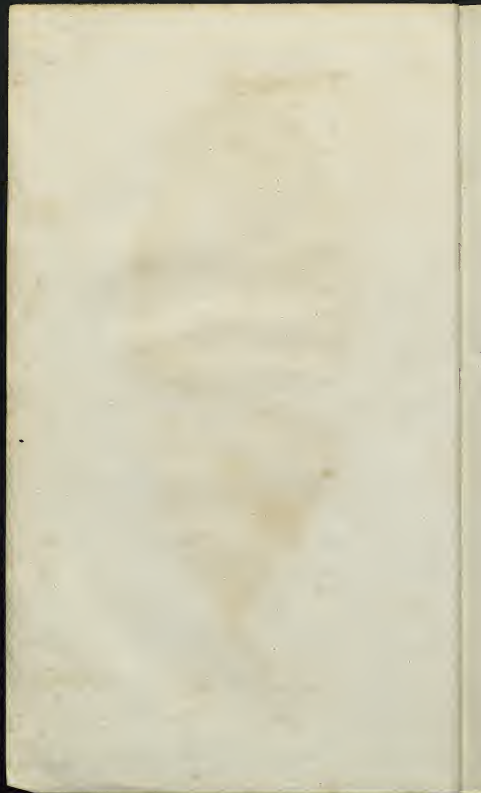
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MANGUE

WURDELL

1828

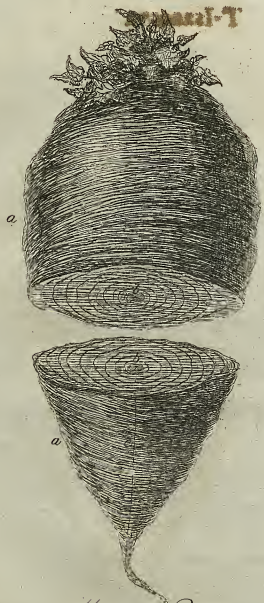
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T-Isaacson

General-T



DN del.

Mangel-Wurzel  
or Root of Scurvy.  
On a Reduced Scale.

T\*Isaacson

BETA DEPICTA,

OR,

Remarks

ON

MANGEL WURZEL,

WITH

*An Exposition on its Utility deduced from Practical Experiments,*

AND WITH FULL

DIRECTIONS FOR ITS CULTURE,

AND THE MANAGEMENT IN FEEDING AND FATTENING OF CATTLE,

By THOMAS NEWBY.

Embellished with an Etching descriptive of the Plant, on a reduced scale.

---

It is to Vegetable productions, that commerce owes its support; they form our ships, cordage, and sails; and it is for Vegetable rarities, principally, that we cross the seas, and explore every clime from the equator to the poles.

PHILLIPS.

---

LONDON :

PRINTED FOR SIMPKIN AND MARSHALL, STATIONERS' COURT.

R. NEWBY, CAMBRIDGE; AND SOLD BY THE AUTHOR, AND ALL BOOKSELLERS  
IN ENGLAND, SCOTLAND, AND IRELAND.

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1828.

1836

BURY ST. EDMUND'S:  
PRINTED BY T. C. NEWBY, ANGEL HILL.

TO THE  
**Agriculturists**  
OF  
THE UNITED KINGDOM:  
THIS  
SMALL WORK  
ON  
MANGEL WURZEL,  
IS MOST RESPECTFULLY INSCRIBED,  
BY THEIR OBEDIENT  
AND  
MOST OBLIGED SERVANT,  
THOMAS NEWBY.

*Reference to the Plate.*

- a. a.* The root on a reduced scale, divested of its large leaves.
- b. b.* The root cut, and exhibiting its rose colour rings.
- c.* The usual proportion of the root beneath the ground when growing.

*Beta Hybrida.*

<i>French.</i>	Racine de Dissette.
<i>German.</i>	Mangold Wurzel.
<i>Class.</i>	Pentandria.
<i>Order.</i>	Digynia.

## P R E F A C E.

---

STIMULATED by a desire to afford all the information in my power respecting the cultivation and use of Mangel Wurzel, and—

To make those plant, who never did before,  
And those who always planted, plant the more !—

I have availed myself of every opportunity in my power to collect materials for that purpose, and of my leisure thus to compile them ; and to use the hacknied apology, “ they are sent forth by the pressing solicitations of a few friends,” and I humbly hope they may be found not unworthy of their attention, thinking with Dr. Jebb, “ that in a good cause, no effort, however trifling, is lost.”

My best thanks are due to those gentlemen, who have kindly favoured me with information on the subject.

I have named the authors of such books, and papers, from which I have made extracts, as far as I could, and where I have not, are from memoranda furnished me by friends.

In the year 1814, the Reverend St. John Priest, the respectable Secretary of the Norfolk Agricultural Society, published a most strange and unexpected account, relative to the effect of Mangel Wurzel upon Milch Cows, on the authority of Lord Crewe, in Cheshire ; T. W. Coke, Esquire, in Norfolk ; and Mr. Tollet, Staffordshire ; that the above root produced in a

few days a paralysis in the hinder quarters, dried up the milk, and killed the cows. On this it ought to be remembered that Mangel Wurzel had been in agricultural use in this country as a cattle food, and in course must have been given to cows, nearly or altogether twenty years previous, and no such inconvenience had been before observed; on the contrary, the root had been found salubrious and fattening to all animals fed upon it.

*This false alarm*, as it was designated at the time, called many able writers and practical agriculturists into the field to dispute the point, suffice it to say—

*Post tempestatem tranquillitas,*

and Mangel Wurzel triumphed! and has since continued in high esteem with all unprejudiced agriculturists in the United Kingdom. The *debate* on the Reverend gentleman's *motion* was long and loud, and was at last negated by a large *majority*. I, of course, voted with the *opposition*!

Sound, sound the cow-horn! herdsmen all,  
 Your's was the vict'ry nobly won:  
 Collect your herds, both great and small,  
 And tell what Mangel Wurzel's done!  
 Now come and browse on Mangel Wurzel,  
 For it will never do you harm,  
 Dissolved is the Eastern puzzle,  
 It really was a *false alarm*!

I take credit to myself for having first introduced the culture and use of Mangel Wurzel into this county, and Isle of Ely in the year 1812; and in giving it all the publicity possible, by publishing in the following year my first "Remarks," compiled



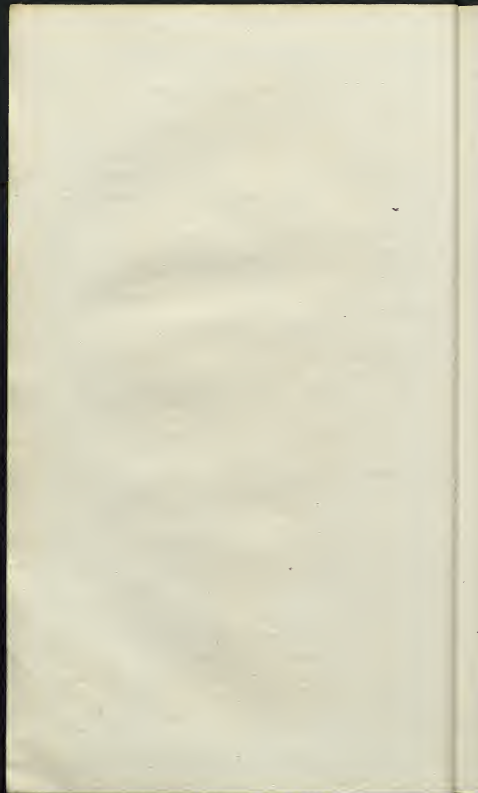
from the kind communications of several practical farming friends.

There is an old proverb which says, "those that do not go fishing, should be mending the nets," and that it is considered wrong in any one to continue indolent, if he can render any service to the public; and as my avowed object is to give a plain account of this unrivalled vegetable, I venture again to offer the produce of my leisure hours, with the earnest hope that it may prove a useful manual to the farm house, and the cottage.

As I am not possessed of the knowledge of an experienced husbandman, the defects that may be found, I humbly crave the candid reader will overlook, and I shall be well pleased, if, after perusing the following pages, he does acknowledge that I have prepared

GOOD ENTERTAINMENT FOR MAN AND HORSE!

Beac't Street,  
Cambridge, March 1, 1828.



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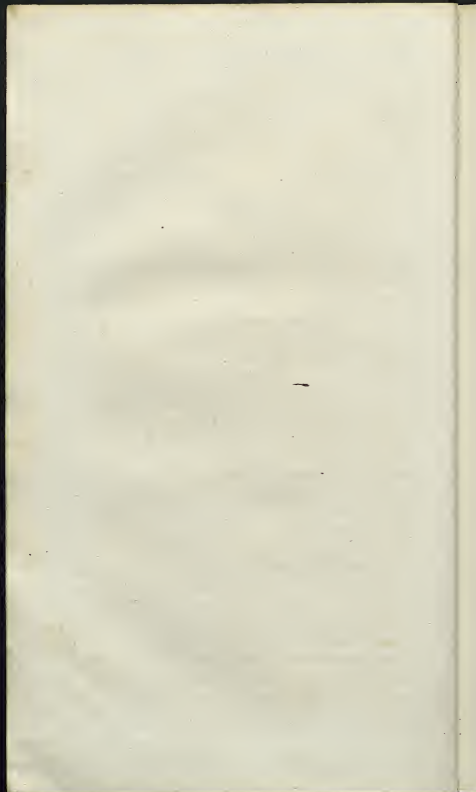
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REMARKS

ON

MANGEL WURZEL.



## REMARKS.

---

THE many kinds of BEET which are known to have been used for the preparation of sugar from their roots, (we are informed by MR. JOHN TAYLOR, of *Leipsig*, in a letter to the Society for the Encouragement of Arts, &c.) are varieties of that species called *Beta vulgaris*, or *Beta caule erecto* of LINNÆUS, and of his *Pentandria Dygina* class and order: they consist of the *Beta rubra vulgaris*, *Beta rubra major*, *Beta rubra radici Rapæ*, *Beta lutea major*, *Beta pallide virens major*, *Beta alba vel pallescens quæ Cicla officinarum*, and *Beta communis viridis*. Of these the principal are the *Beta rubra vulgaris*, *runkel Rube* of the Germans, or *red Beet* of the English, and the *Beta Cicla*, *den weissen Mangold*, of the Germans, or the *white English Beet*; and varieties of those whose roots have coloured rings. HENRY PHILLIPS, Esq. in his *History of Cultivated Vegetables*, says it takes its name from the shape of its seed vessel, which, when it swells with seed, has the form of the letter so called in the Greek alphabet. The Grecians held this root in great esteem, as it was their custom to offer it on silver, to Apollo, in his temple at Delphos. They used also to cut the leaves, in preference to lettuce, and observed

the method of laying a small weight on the plant to make it cabbage. The Beet was first cultivated in this country in the year 1548, a period when many vegetable plants were introduced, to gratify a luxurious monarch.

The BETA CICLA, is the MANGEL WURZEL, or *Root of Scarcity* of Doctor Lettsom, who was indefatigable in his exertions to promote the general cultivation of this, his favorite vegetable; he obtained a supply of seed from the Continent, which he gave freely away to all who applied for it, before the Seedsmen of London could procure them for sale; at which period the worthy Doctor published several interesting papers, descriptive of this inestimable root, from which I shall, in the course of this little work, enrich its pages, by quoting extracts.

We owe to Germany, most probably, the discovery of this useful plant, from whence arises its name, *Mangold* being the German name for Beet; but it is pronounced *Mangel*, by a provincial error, particularly in Swabia, Alsatia, and other southern provinces of Germany, and possibly hence the misnomer originated.

*The Abbe de Commerell* (who was the corresponding Member of the Royal Society of Arts and Sciences at Metz), speaking of the Mangel Wurzel, says: "In Germany, where the greatest advantages have been derived from it, it is called *Dick Ruben*, (the great turnip); *Dick Wurzel*, (the great root); and *Mangel Wurzel*, (the root of scarcity.) I have made use of the last denomination, *the Root of Scarcity*, (*Racine de Dissette*) because it is a literal translation of the name often given to it by the Germans, and because it is ex-



pressiv of the properties of the plant which it denotes. It might, indeed, be called *the Root of Abundance*, which would be no great deviation from the German name, and which would be expressive of one of the principal properties of this plant; which is, constantly to thrive, and to produce a very great crop, even when other kinds of roots and vegetables fail, and when there is a general scarcity of fodder.”

The Beet\* is a genus whose species are, perhaps, as badly ascertained as those of any plants whatever, the *maritima* being the only one with whose place of growth, and history, we are perfectly well acquainted, the species being involved in such obscurity, the varieties of course require much elucidation.

MATTHIOLUS, who published his *Commentarii* in 1565, and whose wooden plates, though some of the earliest, rival many of the copper ones of modern days, has figured three sorts of Beet, which he calls *alba*, *nigra*, and *rubra*.

DODONEUS, whose *Pemptades* came out in 1616, and whose figures, though they do not come up to those of Matthiolum in boldness of design, exceed them for the most part in accuracy, exhibits three sorts of Beet, which he denominates *alba*, *rubra*, and *rubra Romana*.

---

\* Græcis σινιθλος τιουθλος.  
 Latinis Beta.  
 Germanis Mangold.  
 Belgis Beete, Rodebeet.  
 Italis Beta, Bietola.  
 Hispanis Aselgas.  
 Gallis Poirée.

The three Beets of these authors, as far as one can judge from figures, appear clearly to be the *common white Beet*, *common red Beet*, and *turnip-rooted red Beet*, now generally cultivated in our gardens.

CASP. BAUHINE, whose *Pinax* was published in 1623, enumerates nine species, six of which he calls *minores*, and three *majores*.

Minores, *Beta communis sive viridis*.

*Beta alba vel pallescens quæ cicla\* officinarum*.

*Beta rubra vulgaris*,

*Beta rubra radice rapæ*,

*Beta lato caule*,

*Beta sylv. maritima*,

Majores, *Beta pallide virens major*,

*Beta rubra major*,

*Beta lutea major*.

LINNÆUS, who perhaps was too scrupulous in multiplying species, in the third edition of his *Species Plantarum*, reduces the above to two, viz. *Beta maritima*, and *Beta vulgaris*, but in the fourteenth edition of his *Systema Vegetabilium*, published by Professor Murray, the *Beta alba* of BAUHINE, is admitted as a species under the name of *Beta cicla*,† and its place of growth pointed out, viz. *Lusitania ad Tagum*. We may observe that LINNÆUS, in his

\* Called *sicula* originally, because it was first thought to come from Sicily, thence *Sicla*, and by further corruption *Cicla*.

† With all due deference to such great authority, *Beta rubra* and *alba* would have been terms less exceptionable, than *vulgaris* and *cicla*, *vulgaris* being equally applicable to either, and *cicla*, as before observed, unintelligible to most.

*Species Pl.* not knowing the habital either of the red or white, suspected them to originate from the *maritima*.

*Dictionary* MILLER, who, to a considerable share of discernment, joined a very extensive and long continued practice in the cultivation of plants, describes three species, viz.—

*Maritima, sea Beet,*

*Hortensis, common white Beet,*

Varieties. *White Beet, green Beet, Swiss or chard Beet.*

Vulgaris. *Red Beet, with a pyramidal root.*

Varieties. *Common red Beet, turnip-rooted red Beet, green-leaved red Beet.*

On comparing the MANGEL WURZEL, with all the Beets above enumerated, both species and varieties, it is not found exactly to accord with any of them; it seems to approach the nearest to Miller's green-leaved red Beet. It is difficult to say whether it partakes most of the nature of the *vulgaris* or *cicla*; indeed it has all the appearance of a hybrid plant, produced from both; it is certainly a variety only; and if we should be justified in giving it a latin name for distinction's sake, we should call it *Beta hybrida*.

That Beet has long been known as an article in diet, history testifies. The very name of *Cicla* is derived from *Sicily*, a country where it formed a considerable portion of the diet of the people, and was well known to the Romans in general. *Beta* stands at the head of one of Martial's Epigrams, in the following distich:

Ut sapiant fatuæ fabrorum prandia *Beta*,  
O quam sæpe petet vina piperque cocus!

Persius, in his third satire, rallying the delicacy of palate which some of his contemporaries indulged, likewise introduces this vegetable as the food of the common people :

—————tenero latet ulcus in ore.  
Putre, quod haud liceat plebeiâ radere *Beta*.

Prior to these, both Arabic and Greek authors mention the Beets as dietetic plants, and many ancient writers describe their cultivation and culinary uses: among our countrymen, EVELYN, in his *Acetaria*, speaks much in their favour; the "costa, or ribs of the white Beet (by the French called the Chard) being boiled, melts and eats like marrow; but the sea-Beet is the most delicate of all." This species is well known to people living on the sea-coast, who call it *Cliff-spinach*, and frequently cultivate it in their gardens; it differs from the others, not only in being a smaller and procumbent plant, but in having a perennial root.

GERARD observes, that "Beet boiled and eaten with oil, vinegar, and pepper is a most delicate and excellent salad; but what might be made of the red and beautiful root, I refer unto the curious and cunning cook, who, no doubt, when he hath had the view thereof, and is assured that it is both good and wholesome, will make thereof many and divers dishes, both fair and good."

The *Mangel Wurzel* root had become an article of importance on the Continent, prior to its being known in this country, as we find by a communication made to the Society for the encouragement of Arts, Manufactures, and Commerce, by Mr. John Taylor of Leipsig, who says, "You well know that *Director*

*Achard*, of Berlin, first introduced this subject into general notice, and recommended that the Sugar should be procured by boiling the Beet-roots, when taken out of the earth; that they be sliced when cold: that afterwards the saccharine juice be pressed out; that it be filtered, evaporated, and, after evaporation, the sugar be procured by crystallization and pressure." More on this subject will be said hereafter.

And in France, when sugar and molasses were prohibited being exported into that kingdom, BONAPARTE directed his attention to this root, as a national good, and caused it to be cultivated on an extent of upwards of an *hundred thousand acres* yearly, for the purpose of extracting sugar. The establishments for this purpose were very numerous in France, before the abdication of NAPOLEON; the largest I am informed was at *Rambouillet*, but that, with many others, was sold by auction, by order of Louis XVIII.

We are informed by *Mr. J. C. Loudon*, that at the time the French government encouraged the manufacture of sugar from this root, experiments were made on a considerable scale, and with great success, in the town of Bruges. The machinery was unexpensive, and the remaining cost was merely that of manual labour, and a moderate consumption of fuel. The material itself came at a very low rate, about ten shillings British by the ton; and to this circumstance may be chiefly attributed the cessation of the manufacture. Instead of encouraging the cultivator, the government leaned altogether to the manufacturer, and made it imperative on every farmer to give up a certain proportion of his land to this root, without securing to him a fair remuneration. The consequence

was, that the manufacturers, thus supported, and taking advantage of the constrained supply, have in many instances been known to refuse payment even of the carriage of a parcel, in other respects sent in gratuitously; and a consequence still more natural was, that the farmer, wherever they had the opportunity of shaking off so profitless a crop, converted the space it occupied to better purposes. To the manufacturer the profit was ample: an equal quantity of sugar with that of the West Indies, which at that time sold for *five shillings a pound*, could be produced on the spot from *Mangel Wurzel at less than one shilling by the pound*: and to such perfection had the sugar thus made arrived, that the Prefect, Mayor, and some of the chief persons, of Bruges, who were invited by a manufacturer to witness the result of his experiments, allowed the specimens which he produced to exceed those of the foreign sugar.

At a dinner given in the autumn of the year 1827, by the town of Amiens, to the King of France, was placed on the table, opposite to his Majesty, an immense column, composed of *sugar* manufactured from *Mangel Wurzel*, at Franvillers, near Amiens. The column consisted of four different qualities of refined sugar, and crystals of raw sugar formed the pedestal.

It appears from the experiments of *Professor Lampadius*, of Freyberg, near Dresden, that *Mangel Wurzel* roots, contain water, fibrous matter, sugar, mucilage, glair, starch, colouring matter, scented matter, and a bitter substance. The water is in the proportion of from one half to two thirds of the weight of the roots: the fibrous matter of the roots differs, and is considerably more in poor, than rich land; the

saccharine particles vary from two to five per cent. ; the mucilage is from three to five per cent. ; and the glair, or matter resembling white of egg, is about one per cent. ; the starch is in very small quantity, being only about two or three ounces in an hundred weight, the colouring matter undergoes several changes by exposure to the air, as yellowish, brown, and red, and may be precipitated by acetite of lead : the scented matter is volatile ; it rises in distillation of the root with water, combines closely with spirits of wine, and this matter occasions a peculiar contraction in the organs of taste. By boiling the roots, the smell and taste are very much lessened. The bitter substance is soluble in water, and remains behind in the first sirup after the crystallization of the sugar.

THE PREPARATION OF SUGAR FROM MANGEL WURZEL.

*The following are some experiments of Professor Lampadius :*

One hundred and ten pounds of roots, washed, peeled, cleaned, and then grated, gave a mass which weighed eighty-seven pounds, out of which were pressed forty-one pounds and a half of juice, which was boiled with twenty ounces and a half of charcoal powder : this, when filtered and evaporated down until crystallized, produced full five pounds of a brownish yellow-grained sugar, also five ounces of brown sirup.

The above brown sugar, after being dissolved in six pounds of lime water, mixed with one pound of blood, then boiled, filtered, and afterwards evaporated, yielded four pounds, five ounces and a half of purified brown sugar, and six ounces and a half of sirup.

The four pounds, five ounces and a half of sugar

thus prepared were again dissolved in six pounds of lime water, mixed with one pound of milk, then boiled for a quarter of an hour: during the boiling, a small quantity of white wine vinegar, and a little more milk, were added; the saccharine matter was filtered, and treated as before; the product was four pounds of well-grained white powder sugar.

The residuum after pressure, the brown sirups of the two first processes, and the remains of the filtrations, weighed, when collected, forty pounds: they were mixed with one quart of yeast and eighty quarts of water, heated to forty degrees of Reaumur's thermometer, or 112 of Fahrenheit's, and, after fermenting forty-eight hours, were distilled. They furnished at the first distillation, fifteen quarts of weak spirit, which, on a second distillation, gave eight quarts of a better; from which when rectified, were produced three quarts and a half of spirits resembling rum.

From the result of this experiment, it appeared, that after paying the farmer for the roots, and discharging all incidental expences whatever, a profit was yielded of nearly cent per cent, on valuing the four pounds of white powder sugar at one shilling per pound, and the three quarts and a half of rum at one shilling per quart.

It is not to be inferred, that the profit from this process will always equal the above; for subsequent experiments have proved that the crops of roots cannot always be depended upon, nor do they always yield the same quantity of sugar, the produce of different years having varied, from two pounds of sugar per hundred weight of roots, to five pounds, according to circumstances which have intervened. In the year 1800, an



experiment was made at Berlin, under the inspection of commissioners, and it appeared that 1650 pounds of the root produced fifty-seven pounds and a half of raw sugar, and thirty-seven quarts and a half of spirits. It is also affirmed, that when the sweet juice is expressed, the residue of the root will serve to make coffee.

This invaluable production, may now be found in almost every civilized nation in the world, where the climate is sufficiently temperate for its growth: in the year 1816, when BONAPARTE was exiled to *St. Helena*, I had the honour of furnishing a gentleman of this University, with a very numerous assortment of seeds, and amongst the rest, some *Mangel Wurzel* seed, to take with him to that remote island. By the accounts, as communicated from *St. Helena*, to SIR HUGH INGLIS, from GOVERNOR BEATSON, it grew there in its greatest perfection; two of the roots were sent, by Sir Hugh, to England, each weighing FIFTY-SIX POUNDS!!

The quantities there obtained, upon experimental ground, are immense, after the rate of SIXTY-SIX TONS AND A HALF *per acre*, manured with hog-dung and ashes, and SEVENTY-SEVEN TONS AND THREE QUARTERS, with the dung of sea-fowls, probably the most stimulant and powerful of all manure. Without manure the acreable produce was only nineteen tons and a quarter, a lesson of vital consequence to farmers! The Governor, whose attachment to the culture of mother earth, seems full of zeal and duty, made a curious and important experiment on a barren ridge, between two deep ravines, in which, from its declining surface, no moisture could be retained. It was trenched and sown, at the same time with sixteen

different sorts of seeds,—*Mangel Wurzel*—*Coffee*—*Cotton*—*Wheat*—*Barley*—*Oats and Peas*—*Buck-Wheat*—*Spring Tares*—*Lucerne*—*Burnet*—*Sainfoin*—*Silla*—*Chicory*—*Rape and Sunflower*.

For a long time there was no appearance of vegetation; at length, seven months after sowing, and being soaked by rains, the *Mangel Wurzel* appeared, one connected line of thriving plants; but a few of the rape vegetated, which soon after died; and not a plant of the rest ever appeared. The above experiment is the more worthy of attention, as it has been generally supposed in this country, that, the *Mangel Wurzel* will not succeed but upon a rich soil.

I will venture to presume, that NAPOLEON, found an agreeable substitute in this *salad*\* (perchance from the seed I sent) for the *gammon-and-spinach*, he was wont to distribute, and partake of, so unsparingly, when he ruled in France.

#### THE INTRODUCTION OF MANGEL WURZEL INTO ENGLAND.

The *Mangel Wurzel*, was first introduced into this country, for general use, about the year 1786, by *Thomas Boothby Parkyns, Esq.* residing at Metz, in France, who sent a packet of the seed to the late *Sir Richard Jebb, Bart.* which he presented to the society for Encouragement of Arts, &c. and by the secretary, some of the seed was presented to a few of the members, among whom, the late *Dr. John Coakley Lettsom*, was included, who was enabled by the kindness of *Granville Sharp, Esq.* acting executor, of the late *Sir Richard Jebb, Bart.* to give publicity to the following extract, from the *original* letter,

---

\* *Mangel Wurzel*.

dated at Metz, the 19th of April 1786, which accompanied the *first packet of seeds introduced into England.*

“ I have made an excellent acquisition of a *plante*  
 “ *racine*, which has every advantage with the turnip,  
 “ both for the food of man and beast, without being  
 “ subject to the ravages of any insect whilst in its  
 “ infant state ; an inconvenience (which of late years)  
 “ the farmer in all parts of Europe has very much felt  
 “ in the turnip. The scarcity of forage in France,  
 “ for these two last years past, has induced a very  
 “ experienced cultivator in this neighbourhood to  
 “ search for a substitute, when hay and other forage  
 “ fails. He has succeeded to a miracle, almost, in  
 “ the root I mention ; I have seen the root and plant,  
 “ and am so far convinced of its excellence, as a food  
 “ both for man and beast, that I think I shall be able  
 “ to render Old England an essential service in con-  
 “ veying seed there for its being cultivated. The  
 “ leaves are excellent, and much like spinach when  
 “ boiled, all sorts of cattle are fond of them, and they  
 “ may be cut six or seven times in the autumn for  
 “ green forage. The root weighs from *eight to ten*  
 “ pounds,\* and keeps (like the turnip) till the month  
 “ of May following. The cultivator I allude to, fat-  
 “ tened hogs, oxen, and sheep with it last winter, and  
 “ it exceeds his most sanguine expectations. It is

---

\* The roots at *Trente Place*, the product of the seeds, sown by the late Sir R. Jebb, Bart. weighed about *ten pounds* each. The Abbé Commerell says, they grow in Lorraine to *ten* or even *fifteen* pounds. The roots raised in Norfolk to *twenty* and *twenty-four* pounds each.

“ excellent for milch cows, as it causes no disagree-  
 “ able taste in their milk, or the butter made from it.  
 “ The cultivator sent some plants to the *Minister of*  
 “ *France*, it was so approved of, that he desired ten  
 “ quintals, 1000 lbs. weight, to be distributed through  
 “ all the provinces. I have procured two pounds of  
 “ the seed, which the cultivator gets from the *interior*  
 “ *parts of Germany*, and I mean to send some of it  
 “ to the *Society*\* in the Adelphi, with printed direc-  
 “ tions for its cultivation by the above mentioned  
 “ person.”

Amongst the greatest promoters, and earliest culti-  
 vators of this root, I have to notice the late *Sir Wil-*  
*liam Jerningham*, and *Sir Mordaunt Martin*, of  
 the county of Norfolk; to the latter gentleman I had  
 the honour of sending some seed, and receiving the  
 following letter dated—

BURNHAM, NORFOLK MARCH 16, 1815.

SIR,

I have been an attentive cultivator of  
 Mangel Wurzel from its first introduction, and began  
 by sowing seeds from such plants as grew most into  
 the ground, in hopes of their resisting the frost, but  
 was soon convinced of my error; a friend sent me a  
 few seeds from Brussels, they produced plants with  
 very small tops, and growing so much out of the  
 ground, as to bend with their own weight.

I last year bought a pound of *your seed*, and dis-

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\* The account communicated by J. B. Parkyns, Esq. is  
 published in the fifth volume of the Transactions of the  
 Society.

posed some of it, in small packets, as widely as I could, that if it should prove superior to mine, you might have your due credit, the rest I sowed in drills between some wheat *Dr. Lettsom* sent me, and my own: YOURS \* *was certainly the largest, and produced the most foliage, and were so much the clearest from fangs, that I shall continue to save the seed.*

I am now about planting out every well formed root I can spare for seed: to protect them from hares, I have formed a small island in a marsh, but I find the soil (which has chiefly been an old sea-bank) to be much too stiff, that I shall only try a small part of it this season, which may give me the benefit of a change of soil, for my own future use. The chief of the produce of my roots on the upland, I shall allot for sale, for which purpose I shall get a friend in London, to enquire the price at different shops, and then advertise it at the average of their collective price: this year I have barely seed enough left for my own use, having supplied a few friends, and sold the rest.

MORDAUNT MARTIN.

And in another letter which Sir Mordaunt addressed to the *Farmer's Journal*, he observes—"The leaves I gave to my cows in the autumn, thrown on grass-

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\* I hope I shall not be accused of egotism, when I say, that the seed I sent to the worthy *Baronet*, and for which he honourably awarded me "due credit," was of a genuine *improved stock*, and of which, I have continued to supply my friends ever since.

land, as I strip them from the roots, when I pack them up. The roots I gave to them in the same way, between finishing turnips, and beginning grass. When I give them to beasts tied up, I divest them as much as I can of the earth which adheres to them. If I have straw to keep them tolerably clean, I feed them in the farm-yard; if not, on my poorest grass-land, and they prefer them to the freshest grass, and shrink in their milk when they cease to have them; if the remaining stock is in my way, I frequently remove the roots into any empty building for the convenience of feeding my swine till the following harvest. I have sown Mangel Wurzel and Swedish Turnips in drills alternately; every Mangel Wurzel has been bitten by the hares and rabbits, and not a Swedish Turnip touched; I have further covered up a wheel-barrow full of Mangel Wurzel with a cart load of Swedish Turnips, and my cows have turned over the latter to get at the former, as horses do cut straw to get at oats; and swine will leave a corn stack to get at them, and will fatten thereon sufficiently for roasting pork. I had a quantity of Mangel Wurzel at one end of a heap, and Swedish Turnips at the other: the Mangel Wurzel kept as perfectly as mine has invariably done; the Swedish Turnips heated and rotted."

R. C. HARVEY, Esq. of *Alburgh*, kindly favoured me with the following account:—"Although I do not occupy a large farm, still the soil varies very much, and, in order to procure the produce of Mangel Wurzel, I have grown it upon *light, strong, wet, and good mixed soil* land; the latter is far preferable, and next to that is the light land, if you have a tolerable depth of soil. I had last year, upon my best land, FORTY-

SEVEN TONS FIFTEEN HUNDRED ; upon the light about FORTY TONS ; upon good strong land THIRTY-SEVEN TONS ; and upon the wet, cold laud, not more than TWENTY-FIVE TONS, per acre.

“ Respecting the quality, it is, beyond a doubt, superior to any other root known in this country ; bullocks, sheep, or pigs, will leave every other root for it (except for the first three or four days.) It is generally sown with the intent of laying up till the spring of the year, but the quantity I generally grow, would take up too much time, and room, to house or stack the whole of it ; and as I in summer feed from sixty to seventy bullocks, I want those for Smithfield in February, I therefore eat my Mangel Wurzel first, giving the tops to the sheep and cows, which are generally two or three days before they eat it freely.

“ I had last year fifty-four Scots which did the most, fed in that way, of any I ever saw ; I had two which I fed almost entirely upon Mangel Wurzel—they paid me 5*l.* 10*s.* for seven months keep. I consider the bullocks do quite as well at Mangel Wurzel, as at oil-cake. I have been, and am still a considerable grower of Swedish Turnips, but could never grow more than two-thirds of the weight, the Mangel Wurzel would get per acre.”

In *Hertfordshire*, it was first introduced amongst the tenantry of the MARQUIS OF SALISBURY, who have ever since been growers, for the sole purpose of feeding, and fattening of cattle. A better proof of its utility cannot be given, than the following extract from a letter, which I received from a gentleman, who is a considerable grower in that county :—“ It saves all the expence of oil-cake to those who wish to fatten

their cattle, Mr. Stevenson, of Hatfield, having fed forty head of bullocks, sheep, &c. upon it, for these four or five years past, and it only wants to be generally known to be universally cultivated."

" Dear native land, how do the good and wise,  
" Thy happy clime, and countless blessings prize !"

It affords an excellent substitute, to feed with, when other food is scarce, or considered too dear to buy, as will appear by the following account, which was transmitted to me, from a friend residing in the fens, with an order for seed :—" I thank you for recommending the *Mangel Wurzel* to me last year, it is a *rara avis* with us here ; but I will never be without it, it saved me the expence of buying peas, beans, or barley, last summer, to feed some store hogs ; in fact I must have parted with them, had it not been for the *Mangel Wurzel*. I had no other food for them, and it would not have answered to buy ; but thanks to you, and *Mangel Wurzel*, my hogs did well, and paid me for keeping them. My neighbours envied me my food, and regretted that they were not growers of this excellent root, and even those who once condemned it, (and many did, without knowing anything, as to its merits or demerits) said they would not be another season without it."

The following account was sent to me, by an old acquaintance resident a few miles from Cambridge, a share of whose friendship I enjoyed uninterruptedly for many years :—" The quantity of *Mangel Wurzel* I grew last year, answered exceedingly well indeed. I never grew anything where the produce was so great, or my cattle did so well with. Since



the *inclosure* of our parish, we are deprived of our *commons*, and nearly all the grass-land, is converted into arable, or, in other words—"two farms have (like Aarou's rod) *swallowed up the remaining seven*," and very few have the convenience, or means, to keep stock for their own use. Be assured my friend, an *inclosure bill*, is the seldom-erring signal of ruin to all the small farms of the parish, with a melancholy train of collateral consequences; this is a subject, that ought to be considered by even our rulers: there may be some difference in terms; but the infatuated and cruel ambition, which would reduce the independent tiller of the soil, to a state of servitude, would, with equal apathy, overwhelm thrones, and lay crowns and sceptres in the dust.—

- "Where then, ah! where shall poverty reside;
- "To 'scape the presence of contiguous pride?
- "If to some *Common's* fenceless limits stray'd,
- "He drives his flock to pick the scanty blade;
- "Those fenceless fields the sons of wealth divide,
- "And even the bare-worn *Common* is deny'd."

"The leaves of Mangel Wurzel, kept my hogs and cows in the summer, and the roots in the winter and spring: they eat it with great avidity, and did well upon it. As an article of food for cattle, it has no parallel, and it is worthy of recommendation to those, who have no grass-land, and even the labourer who has a little ground, would do well to cultivate so useful a substitute, as it will afford food for a pig, or cow, without buying corn or hay, which is generally too dear in summer, to answer his purpose to feed with, and not less so in winter."

Part of my friend's letter, brings to my recollection the following lines, which I used to repeat when a boy, and although not analogous to my subject, I take the liberty of inserting here.

The Crime is great, in man, or woman,  
That steals a *Goose* from off a *Common* !  
But who can plead that man's excuse,—  
Who steals the *Common* from the *Goose*.\*

I resume with the following extract from a letter I received from J. B. BURCH, Esq. of Brandon, Suffolk.

“From the judicious management of Mangel Wurzel, on the DUKE OF NORFOLK's farm, at Fornham, near Bury, by keeping it for spring feed-

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\* “ In every country, in all situations and circumstances, and in our own country, particularly in the situation in which it is now placed, it is of the highest importance to consider, whether a mere increase of wealth may not be purchased too dearly; whether it is prudent or wise to diminish the number of those whose souls are knit to their native land, by stronger ties than are known to the mere manufacturer. To the patriot, it can be little satisfaction to see his country the richest in the world, if the measures and causes which make it rich, diminish in the most trifling degree, its independence; either by raising any passion above the love of our country, or by diminishing the number of those who must be its most natural and powerful defenders. To the moralist it can afford little pleasure to be told, that by the saving of agricultural labour, the manufactures of his country will be extended or increased, if he perceive that by the change of employment, the health and virtue of part of the community are sacrificed.”

STEVENSON.

ing, his dairy has (now\*) a *plenty*, while others are *starving*, from the want of turnips, and the backwardness of all the grasses in this inclement season; and beside he is finishing his last lot of Devon bullocks upon them.

“ How long will farmers remain blind to their own interests !”

And in another letter written prior to the foregoing, Mr. B. says:—“ In the first year of my growing Mangel Wurzel, I gave the leaves to my cows, and they fed upon them very heartily; as I fattened some bullocks with the roots in the winter of that year, I did not give any to the cows until the following spring, when each cow had, as long as they lasted, about one bushel a day: a *sweet flavour* was soon distinguishable in the milk—the quantity increased—and the *butter partook of the sweet flavour* of the milk.

“ I did not continue the practice of gathering the leaves, because I conceived it was injurious to the growth of the root.

“ My crop of the second year was given in part to the cows, when first severed from the ground: the same *improvement* was immediately discoverable in the milk, and the butter, as well as in the condition of the cows. As I wished to save a pasture for mowing that season, I reserved the other part of the roots till the spring: I found them in the month of May, as sound as when gathered; they remained so till the cows had finished them, the latter end of June. I gained my crop of hay—I had delightful May butter;

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\* Date of the letter, April 27th.

and my cows had all the appearance of the highest state of health. I have had no cause subsequently, to alter my opinion of the PREMINENCE of the MANGEL WURZEL root for the dairy.

“ I have often heard the like praise bestowed upon the Mangel Wurzel root, by gentlemen who have tried it on a much larger scale, than the scope of my little farm will admit of.”

To those interesting and important communications, I could add many more, and cannot refrain from quoting a short extract from a letter, published in the *Farmer's Journal*, from the pen of B. HOLDICH, Esq.\* of Thorney, in the Isle of Ely;—speaking of Mangel Wurzel, he says:—“ It is desirable we should have a name for it in ONE WORD. It is beginning to be called WURREL in some parts, and some call it WORZEL, and WEZZEL. It would be a deserved honour to its original advocate, to call it LETTSOM. Let any considerable seedsman advertise the seed by this name, and the thing is done.”

#### PRODUCTION.

The extraordinary produce on several farms, in this and adjoining counties, will appear wonderful to those, who have never seen it cultivated. The average quantity of food, produced on several farms, is FIFTY-FOUR TONS, or 2650 bushels per acre. Suppose an acre of land divided into rows, eighteen inches asunder, and the plants of Mangel Wurzel to be

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\* The late ingenious Editor of the ‘Farmer's Journal.’

twelve inches apart, it will on computation contain about 30,000 roots, and suppose each root to weigh on an average, about five pounds, it will produce about *Sixty Tons*, by this it will be proved to take the precedence of turnips.

The *Abbe de Commerell*, gives the following account of the nett produce of an acre of land, Lorrain measure. "In order to save cultivators some trouble, in calculating what quantity of roots may be produced in an acre of land, Lorrain measure, which is nearly equal to half an acre of France, I will state here the method of proceeding in that calculation, and of shewing the result. The acre of land contains 250 square rods, the rod contains ten feet, and the foot ten royal inches: the acre then comprehends 2,500,000 square inches of surface; but every square of eighteen inches contains (multiplying 18 by 18) 324 square inches; and thus, in dividing 2,500,000, by the number of square inches necessary to every root, it will be found, that 7,716 roots may be planted in an acre of Lorrain, placing them at eighteen inches distance; there remains indeed a fraction in this calculation; but this may be disregarded."

The following relation was communicated to Dr. Lettsom by a gentleman at Ipswich. "Mr. D— near Swaffham, Norfolk, received some seeds of the Root of Scarcity from the late Sir Richard Jebb, Bart. which he sowed in light rich earth, in a drill, at the end of April last: when the plants had acquired the thickness of a quill, some were transplanted, and others left in the seed-bed. On taking up the latter on the first of November after having had their leaves several times previously plucked during the summer, a single

root, with a moderate top, measured *three feet two inches* in length, and *twenty-seven inches* in circumference, and weighed *twenty-four pounds*, with the top, and *twenty-one pounds* without it. Those roots which had been transplanted, acquired only about half the size. Mr. D. is of opinion that sowing them after the manner of turnips, in well ploughed earth, manured as for turnips, and hoed to eighteen inches apart, with their *leaves untouched*, would prove the best mode of culture. From this astonishing instance of vegetation, we may calculate, that upwards of fifty pounds weight of provision has been produced in about half a yard of soil!"

DR. LETTSOM further informs us—"I calculate, from the product of my garden, that a square yard of ground, planted with the Mangel Wurzel, will yield **FIFTY POUNDS** in weight of salutary food: an abundance equalled by few, if any other plants hitherto cultivated in Europe."

In the year 1813, I received two roots from OLIVER CROMWELL, Esq. *Cheshunt Park, Hertfordshire*, produced from seed I had the honour of supplying him; they weighed, together, *Sixty one pounds*, the heaviest of the two weighed *Thirty-one pounds*, and measured, *thirty-four inches* in length (including five inches of the stalk leaves) and *twenty-eight inches* in circumference.

The following is an extract from a letter, from R. Ramsden, Esq. Carlton Hall, Nott's. "I have a large quantity of it (Mangel Wurzel) this year, *thirty-eight tons per acre*, and all of it will be given to cows, with a little hay as formerly."

J. Braddick, Esq. of Thames Ditton, in a letter

published in the *Farmer's Journal*, says :—" I have only *one quarter of an acre*, of this root, which I judge has produced, between **FOURTEEN** and **FIFTEEN TONS** of roots. The plants if left at eighteen inches apart, each way, must of course give a greater produce, the roots average about eighteen pounds each, from which, deduct three pounds for top, about fifty-seven roots stood in a square rod. I have fed two large hogs for ten weeks past, on these roots, they now only require a fortnight's keep on pease to harden their flesh previous to killing. I have now one heifer up fatting on the roots of this plant, and three milch cows, eat daily of the roots, and tops, which latter are plucked off as the plants are taken up for use."

*T. Herod, Esq.* of North Creek, says :—he sowed the Mangel Wurzel, broad cast on the 4th of June, harrowed it in the same as turnips are usually harrowed, when sown in that way the land being in a high state of cultivation, produced **SIXTY TONS AND TEN HUNDRED WEIGHT per acre.**

" It should never be forgotten," says *Mr. P. Simpson*, " that forty-eight tons, the produce of only a single acre, of this root, will make ten bullocks fat enough for the butcher ; and that six acres, of equal produce, will fatten sixty bullocks ; that the profit on each bullock will be considerable ; and that when the business of feeding is over, the yard will be full of rich dung : neither should it be forgotten, that the tenant who sells his straw, cannot partake of any of these advantages."

In the Fens of Cambridgeshire and Isle of Ely

A vast expanse, beyond what eye can ken,  
From Ely's lofty tow'rs to Lincoln's fen.

The Mangel Wurzel has met with great approbation, and on many farms the produce has been abundant beyond example. 'The present face of this country wears a very different aspect (says an anonymous writer) to what it did formerly: for it is a maxim, wherever we see a religious foundation, the circumjacent lands were rich and fertile, as the Ecclesiastics of former days had the picking and culling of all the good things of the earth; they would never fix their residence but where they might be accommodated not only with the conveniences but the delicacies of life; and their aquatic situation supplied them with plenty of fish for their fasting days.'

The pamper'd abbot fixed here his stand,  
 To riot on the fatness of the land,  
 Where verdant pastures once were wont to feed  
 The fine-fleec'd sheep, and ox of largest breed;  
 Where rapid rivers yield the fishy prey,  
 To fast delicious on each maigre day.

The reader will excuse this digression, when he reflects that it is designed as a compliment to the Fen country.'

#### SUBSEQUENT COMMUNICATIONS.

The following account appeared in 'the Cambridge Independent Press,' on December 1, 1827, respecting the management of Mangel Wurzel.—"Have a sufficiently number of men or women, on the piece, to pull them up, and cut off the greens, taking care to cut off enough of the crown to hold the leaves together\* ;

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\* With all due deference to this anonymous writer, I beg to differ from this mode of *cutting* off the tops; I strongly



two dung carts must stand near, and the roots must be thrown in one, and the greens in the other. Draw the roots to your rick-yard (or near where you intend to consume them) and get ready a large quantity of dry straw; and then begin a stack large enough to contain the quantity you wish to store, by placing, first a layer of straw about a foot thick, and then a layer of roots about the same thickness, and so keep on alternately with straw and roots, until you are of sufficient height, and then top it up in the same manner, and thatch it, and they will keep without any further trouble all the winter. This plan secures them from frost, with the exception of a few near the outside; it secures them from heating, which they are very apt to do; it secures them from wet, which will otherwise injure them; and the straw will afterwards serve to litter up the pen where the cattle eat them. A cut of the rick, may be cut down at any time, the same as hay is cut, without disturbing the whole, and this plan prevents the necessity of filling the sheds and outhouses, which may, therefore, be usefully employed for other purposes. The greens, of course, must be used directly, as they will not keep; and the plan I adopted, was to draw them out on a piece of pasture ground, and spread them about with dung-forks, and they were thus eaten by my cows, and on which they thrived exceedingly. If they are left on the piece where they grew, they will either get dirty, or dusty, so that nothing will eat them

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recommend stripping them with the hand, which prevents the roots (from what is termed) *bleeding*, which they are apt to do, and ultimately to rot.—T. N.

well, but if a little dirty the first shower of rain, after they are strewed on the pasture, washes them clean, and the sheep, notwithstanding, may be folded on the ground where they grew. This then is my (I think) original plan for securing the roots, and making the best of this valuable plant: and I, last winter, kept well *seventeen* breeding sows upon it alone, and at a time when beans could scarcely be procured at any price, and I found its advantage at such a time almost incalculable, and I have no doubt the more it is known, the more it will be cultivated."

The following is an extract of a letter I received from a friend in the North—dated

PERTH, MARCH 10, 1827.

"In the mountainous districts in Scotland, according to good old custom, it is deemed an admirable property in sheep, to starve well, and to escape in certain proportions with skin, horns, and bone through the rigours of winter. The provision for cattle is very scarce, hay and straw, where most wanted, are either too dear, or cannot be purchased at all; Linseed has been resorted to, boiled, and mixed with cut wheat straw forming a jelly, and given to cattle at the cost of about sixpence per day each. Pigs, store sheep and ewes are kept at a great expence. The Lincolnshire farmers, I am informed, are suffering great loss from the total failure of their turnip crop; and doubly fortunate those, who like myself, can go to a good store of Mangel Wurzel roots; my crop of about four acres, produced about 180 tons of good sound roots, and were I inclined to sell what I have left, (and I have not many) I could command almost any price

for them, as many farmers in this part of the kingdom are under the necessity of sending their stock into other counties to keep them from starving. Another year, many of my neighbours have determined on cultivating Mangel Wurzel, and some to great extent, instead of turnips." R.

MR. WHITECHURCH, a very considerable farmer at Harlton, Camb's, is a successful cultivator of Mangel Wurzel; Mr. W. informs me he grows it principally for the feeding of his ewes in the spring, and that he has been feeding seven or eight milch cows this winter upon the roots, and they are doing amazingly well. Mr. W. assures me, that no other food whatever will produce so much profit to the farmer, and he has noticed, whenever his milch cows have been debarred from eating Mangel Wurzel, the decrease in their milk has been very great. Mr. W. this year began to feed his swine upon this root, and to use his own words—"the pigs grow like weeds." Jan. 5, 1828.

At the last meeting of the Bath and West of England Agricultural Society, a letter from MR. JOSEPH LOUCH, on the culture of Mangel Wurzel, was read, and a specimen of the root, grown at Hambridge, near Bridgewater, and weighing about thirty pounds, was submitted to the inspection of the meeting. Mr. Louch observed in his letter, that he had sent this specimen to the Society, in the hope that it might induce gentlemen to direct their attention more decidedly to the cultivation of the plant. Its utility was generally allowed; it being, in a scarcity of grass, an invaluable substitute for hay; while the expence attendant on its growth was trivial. Any land would do for

Mangel Wurzel. Even where turnips failed, he had known the cultivation of this plant succeed. He had chosen for it a strong blue soil of about two acres, on which sheep had been previously folded; and had planted about two inches below the surface of the ground, suffering the leaves to remain on the plant, which served as a protection from frost, and did not, as had been supposed, do an injury to it. The result had been—a very abundant crop; the roots weighing from fifteen to thirty pounds each. The fact of its cultivation being so cheap, so easy, and practicable, on any description of soil, would he hoped, render Mangel Wurzel an object of more general attention. 1828.

The following very *Friendly* epistle, I received last season. My poetic correspondent having so faithfully described his method of cultivation and its results, I cannot refrain from inserting it, with the omission of his name and residence, as perhaps he had no idea of my giving it publicity; I will, however, venture to say, the letter bears the post-mark of a market town in Suffolk.

ESTEEMED FRIEND,

I write to let thee know  
 How well thy Mangel Wurzel seed did grow;  
 I had it from thee, in third month last year,  
 On the ninth day—as doth per bill appear;—  
 And unto thy directions (thou did'st send  
 Enclosed in the bag) I did attend:—  
 I plough'd, and dung'd, and harrow'd well my field,  
 (I know bad farming does no profit yield!)

I soak'd the seed for four-and-twenty hours,  
 Which expedited much its growing powers ;  
 On twelfth day of fourth month I did begin,  
 With greatest care, the seed to dibble in ;—  
 The ridges fourteen inches from each other,  
 And with a rake, the seeds did safely cover :  
 After a little time the plants appear'd,  
 And many thistles too, the sunshine rear'd ;  
 I then employ'd a man, and little boy,  
 With hand and hoe, the thistles to destroy ;  
 The Wurzel soon large spreading leaves display'd,  
 Which pleased *Rachel B\*\*\*\**, my dairy-maid ;  
 For all my milch cows on the green tops browz'd  
 Until the period, when the roots were hous'd ;—  
 And *Rachel* doth affirm, she ne'er before  
 Had such delicious butter in her store !  
 And not a cow, at morn and eve did fall  
 In milk, to send her home a brimming pail !  
 Two acres, did near *eighty tons* produce  
 Of valued food for starving winter's use ;  
 Some of the roots 'bove thirty pounds did weigh, }  
 My old friend *S\*\*\*\**, had no such roots as they, }  
 Half his were spurious, which ran away.— }  
 He says, in future he'll be rul'd by me,  
 And buy his Mangel Wurzel seed, of Thee !  
 Farewell ! Friend N—, please at thy leisure send  
 Ten pounds of Wurzel seed, for  
 Thy assured Friend,

\*—\*—\*

\* ——— 4 Month, 6th, 1827.

I am honoured with the following interesting communication from *J. C. CURWEN, Esq.\** Workington

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\* The father of the soiling and steaming systems in England.

Hall, Cumberland, M. P. and one of the most experienced agriculturists in the kingdom.

WORKINGTON HALL, JANUARY 9th, 1828.

“ In one or two instances where the soil was adapted, I had abundant crops, not less than SIXTY TONS *per acre*. The seed of the Mangel Wurzel, is of slow vegetation, to remedy this, I mixed it with sand, and put it in a warm situation, wetting it a little, so that it vegetated before I sowed it; I found this an improvement. I consider this root as amongst the first for feeding: some care is requisite not to give it in too great quantities, as it is apt to foment on the stomach, and produce inflammation—salt is a great preventative. Where steamed food is used for cattle, it answers before all other roots. *Lord Althorpe*, and other efficient, have left no doubt of the excellence of this plant. On peat soil it thrives well. Deep ploughing is essential, to give the tap-root solidity in striking, wherever it is prevented either by the quality of the soil, or stones, the plant fails. Stripping the leaves may answer in a little way, but on a great scale, the expence is too great, and I think it must injure the root. The necessity of protecting it against frost, is attended with some expence. Where the soil is dry, I see it is protected by pitting, as the Irish do their potatoes, with a course of straw. On loam well prepared I have had Sixty Tons—on clay, with every care and attention, from fifteen to twenty tons of bulbs. In Norfolk, Mr. Coke says he can get fifteen tons, with less than half the expence requisite for Swedes, &c.”

J. C. CURWEN.

I am also favoured with the following from MR. W. CLAYDEN, a highly respectable, and extensive farmer at Littlebury, Essex.

LITTLEBURY, JANUARY 14th, 1828.

“I have now cultivated this most excellent root for three years, on several descriptions of soil, and consider it of great advantage to the occupier of a strong clay soil, which is not adapted to the growth of turnips, as it comes early to maturity, and may be carted off the land any time in October, thereby enabling him to winter more stock, and to sow his land with wheat, if he thinks proper. It is also serviceable on light soils, as it has been with difficulty during the drought of the last three or four summers, that a plant of turnips has been secured; but with Mangel Wurzel, if the land is in a proper state, and the seed good, you are almost sure to obtain that desirable object, it not being so liable to be injured by the attacks of insects: but I should recommend all who cultivate it, not to be niggardly either of seed, manure, or hoeing.

“I have principally given it to store cattle, and milch cows I have always found them to thrive particularly well with it, and it is free from the objection for the latter purpose, to which turnips are liable, that of imparting an unpleasant flavour to the milk. I have now some bullocks fattening upon it, with the addition of one oil-cake per day. I consider them going on fast. I think it ought not to be given till the beginning of January, and as the year advances, it becomes more valuable up to the Month of May. The quantity grown has, I think, in many instances, been over-rated, and I should consider will vary ac-

ording to the difference, in soil, and culture, from twenty-five to forty tons per acre : no exact period can be fixed for sowing, that must vary according to the nature of the soil, as on rich land, if planted too early, it is apt to run away, and on poor land, if too late, liable to be attacked with wire-worm, or grub."

WILLIAM CLAYDEN.

MR. MOYSE of Denny Abbey, a gentleman of great practical knowledge in farming and grazing, having invited me to visit him, and see his stock, feeding and fattening, on Mangel Wurzel: I accepted his kind invitation, in the last week of January 1828, when I had the gratifying pleasure of being shewn over his extensive farm, containing nearly thirteen hundred acres—where

White shine the flocks, in narrow cots reclin'd,  
Where spotted oxen o'er the lawn appear.

The general arrangement, neatness and regularity, united with convenience and economy, so very visible on Denny Abbey Farm, exhibits a specimen of that agricultural judgement and knowledge so requisite and necessary to an English farmer.

An able writer on agriculture, wisely says:—"Instead of large proprietors attempting to rival the meanest of their tenants, in farming for pecuniary profit, which, on a fair calculation, they rarely, if ever obtain; let their views in agriculture be professedly and effectually directed toward the pecuniary advantage of their tenants: for from them, only, their own can arise, in any degree that is entitled to the attention of men of fortune. Instead of boasting of the



price of a bullock, or the produce of a field, let it be the pride of him who possesses an extent of landed property, to speak of the flourishing condition of his estates at large, the number of superior managers that he can count upon them, and the value of the improvements which he has been the happy means of diffusing among them. Leave it to professional men, to yeomanry and the higher class of tenants, to carry on the improvements, and incorporate them with established practices, to prosecute pecuniary agriculture in a superior manner, and set examples to inferior tenantry. This is strictly their province; and their highest and best views in life. It has been through this order of men, chiefly or wholly, that valuable improvements in agriculture have been brought into practice, and rendered of general use." Such a landlord, appears *H. P. Stanley, Esq.* the proprietor of Denny Abbey estate.

Mr. Moyse informed me, that he was prejudiced, a few years ago, against the cultivation, and use of Mangel Wurzel, (doubtless through "the false alarm," which spread from Norfolk,) but at last, his better judgment overcame his prejudice, and he resolved upon cultivating it, and trying its merits as a cattle food; and a better proof cannot be given of his opinion of its intrinsic excellence, than by his having ever since cultivated it to a very considerable extent: the last season Mr. M. planted forty acres, and calculates the produce of roots, at *fifty ton weight per acre*; the year previous, Mr. M. says he had *forty-eight tons*, and the crop was not so abundant as the last; several roots this season, weigh *forty-two pounds each*. I walked with Mr. Moyse, and his

bailiff, to see the Mangel Wurzel stacks, three of which are *one hundred and ninety-two feet in length* each, and about *twelve feet wide* at the bottom, and another (now opened) *one hundred and sixty-two feet* in length, and the same width as the others; they are about *eighteen or twenty feet high*, from the level of the ground to the ridge; they are piled with alternate layers of haulm straw, from the bottoms to the tops, which are formed to a ridge, and thatched. Mr. M's bailiff informed me, that they took *seventy-four acres of haulm* to complete them, and he calculated that the four stacks contained *two thousand tons weight* of solid nutritious cattle food.—

Reserv'd till vegetation shrinks and dies;  
 Till yon fair spotted tribes, that range the dale,  
 And frequent wait the ruddy milkmaid's pail,  
 View the gay plains when verdure went to glow,  
 Incas'd in ice, or buried deep in snow.

Mr. Moyse never strips the leaves from the roots, unless he wants them for his stock, thinking, that the trampling over the land, and loosening the roots, occasions more injury, than the value of the leaves will compensate; but when he takes up his crop, ploughs them for manure, as is customary with green coleseed.

In sowing for a crop, Mr. M. recommends, (especially on *good* land) to plant them in ridges thirty inches asunder, and to leave the plants eighteen inches apart.

In commencing feeding with Mangel Wurzel, Mr. M. limits the quantity, till by degrees his stock eat what they choose, especially his fattening beasts; between forty and fifty of which I saw feasting upon it.

and many of them ready for the butcher; Mr. M. assured me that they had eaten nothing else, except a little hay: the roots are given to the beasts, and to all the other stock, *whole*; I recommended slicing them, but Mr. M. had tried it, and found it better to give the roots whole, to all stock. Mr. M. sends several Mangel Wurzel fattened beasts, (and sheep) to Cambridge\* weekly, and supplies their places with others, principally Scots, and as soon as he had fed off his Swedes, he intends placing 200 beasts upon Mangel Wurzel.

In conclusion, Mr. Moyse gave me his decided opinion, that Mangel Wurzel, as a cattle food, for either feeding, or fattening beasts, or for milch cows, far excelled every other, and had not the least doubt, that ere long, it would surmount every prejudice, and become an article of general cultivation throughout the empire.

MR. ARCHER BUTTERFIELD, of Bassingbourn, Cambridgeshire, has obliged me with the following communication, Mr. B. says:—

“I have been in the habit of growing Mangel Wurzel for some years, the last two years past, I have sown about ten acres per year; I generally sow it on a light Moorish soil, so much so that it is not calculated to bear corn, I find it does much better on that kind of soil, than on old ploughed land, being extremely troublesome on a dusty soil—the leaves I give

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\* If any of my beef-eating friends in this neighbourhood wish to taste of Mangel Wurzel beef, I strongly recommend them to Mr. Cross, the respectable butcher, in Sidney Street.

to my cows and sheep, which they are extremely fond of. I am feeding pigs with the roots, and they thrive upon them; and also my milch cows, and find they are a fine thing for milk. I have fattened beasts with them, with very little else beside. Horses, when used to them seem to prefer them to any other food: sheep and lambs eat them with avidity, and in my opinion Mangel Wurzel is far superior to Swedish turnips for any kind of stock."

A. BUTTERFIELD.

Bassingbourn,  
January 25, 1828.

W. WEDD, Esq. of Foulmire, Cambridgeshire, has been a grower of Mangel Wurzel for some considerable period, and informs me that he has obtained *twenty-four tons* (exclusive of the tops) per acre, from land very unfavourable for the growth of this root.

January 26, 1828.

I here give the following very valuable extract from a letter, I am favoured with, from J. WILLMOTT, Esq. a gentleman of great practical knowledge of husbandry, in general, dated

LEWISHAM, JANUARY 23, 1828.

"I herewith send you a few hints (hastily put together) on Mangel Wurzel, which from the care that has been taken for the last few years in saving the seed, from the very best roots, is now getting into very general use, and deservedly so, as there is nothing to compete with it in value, as a winter food for cattle; indeed if we go on improving the stock, as we have done for the last two or three years, there will not be

a farmer of any respectability, who will not think it necessary to have a few acres of it. The large quantity of *foreign seed* sold last season, and the very little that proved good, has, I hope, sufficiently opened the farmer's eyes, and no argument will, I trust, persuade them to sow the *imported rubbish*, when good English seed from transplanted roots, can be procured at any price—I say transplanted, because I know there have been instances where the seed has been sown in rows in the month of August, and being promiscuously thinned out, and the winter proving mild, they have survived, and produced abundance of seed, of which there have been many complaints, and serious ones too—this however can only happen when the winter is unusually mild, and the roots small, for if they are of a tolerable size, and the crowns are not covered, they are sure to be destroyed the first severe frost, that happens about Christmas—respecting the cultivation of the roots for winter use, I have only to remark, that the drills should be drawn, from two feet, to two feet, three inches apart, from row to row, according to the goodness of the ground, and size of the lands, always remembering, the richer and better the land, the more distant the plants should be from each other; thus, if the soil be very good, the plants in the rows may be left sixteen or eighteen inches apart from each other, but if it should be of inferior quality, a foot to fifteen inches will be sufficient:—with respect to taking off the leaves, I never could see much advantage in it; if the season should be very dry, and grass short, it may be advisable to do so, to a certain extent, but otherwise the damage done to the crop, by destroying the

roots, and treading down the ground, is more than adequate to the few leaves that can be got from the plant, at this season of the year.

“As a proof of the advantage to be derived from growing this root, in preference to any other, it is sufficient to say, that a neighbour of mine, who has for some years cultivated the root, to a considerable extent, has, the three last years, made more of it, than any other crop on his farm. In the autumn of 1825, he sold his crop as it stood, on the ground, for *forty pounds per acre*:—the following year he sold it for *thirty-three pounds*; and the last autumn he got *twenty-eight pounds*: this low price, was in consequence of the seed not coming up, in one part of the field, where the land would not work well, and from the dry weather setting in so soon after sowing, there was not more than half a crop; even however at the latter price, I do not know what is to compete with it, in value, nor no one that does less injury to the land.

“The plants from the early sown seed will, a great many of them, be very troublesome, in running to seed; and the quality of the roots, from the latter sown crop, is always of superior quality;—it is necessary that the land be well manured, and ploughed at least three times, to pulverize it, and make it fit to receive the seed; with these advantages, and keeping the land well horse-hoed in the summer, from thirty to forty tons weight may be reasonably expected per acre, and if sold for only twenty shillings a ton, or sixpence a bushel, it will pay better than any other crop that I am acquainted with.”

JOHN WILLMOTT.

The following extract, from a letter I am favoured with from MR. WILKIE, a most intelligent agriculturist, will shew the enormous produce per acre, under good husbandry; upon the land of the Right Honorable the Earl of Hardwicke at Wimpole, in this immediate neighbourhood.

WIMPOLE, JANUARY 26, 1828.

“I have cultivated Mangel Wurzel for the last twelve years, to the extent of ten or twelve acres a year, with great success. As to weight I have generally grown from SIXTY TO EIGHTY *Tons per acre*—have given the roots to all kinds of stock; but chiefly to bullocks and sheep. The leaves I always cut off when the roots are taken up, and feed them off with sheep on the ground where they are grown, which is a great benefit to the land, as I generally find they produce as much feed as half a crop of ordinary turnips. Mangel Wurzel and straw, without any allowance of hay, will keep young beasts in excellent condition. I have above fifty at present chiefly in this keep: it is an excellent thing for milch cows, as it produces a great flow of milk, and gives a richness to the butter, without imparting any bad taste, as is the case when fed with turnips.

The great advantage of Mangel Wurzel is, that it can be grown on land not adapted to turnips, and without the uncertainty attending a turnip crop, as being but little affected by the turnip-fly—thriving luxuriantly in dry seasons, in consequence of its having a long tap-root, and drawing nourishment far beyond the reach of the drought; and hence in my opinion, impoverishing the surface soil less than most

root crops. It is an excellent preparation for wheat, as we generally grow our best wheat after this crop. The preparation of the soil for Mangel Wurzel, the same as for turnips, with the same quantity of manure. I have occasionally in the sowing process, drilled the seed in on a flat surface; but the best way is to dibble in the seed on the Northumberland drills or ridglets, after being well rolled down at nine inches apart in the rows, the ridglets being twenty-seven inches apart, will bring the plants to stand eighteen inches square, which I believe is a good distance to get a weighty crop. I have no other observations on the subject worth mentioning at present, and shall be happy at any time to give you all the information in my power on the cultivation of this valuable root."

THOMAS WILKIE.

By taking the average-extent of land, cultivated by Mr. Wilkie, and the average weight per acre, gives the enormous amount of SEVEN HUNDRED AND SEVENTY TONS of cattle food, from only eleven acres of land—this I think stands unprecedented in the annals of agriculture!

The following I received from a most respectable friend, dated

CLAY HOUSE, NEAR ALTRINGHAM,  
1st MONTH, 31st, 1828.

"As far as I know, much attention has not been paid to the cultivation of Mangel Wurzel, in the neighbourhood of *Sheffield*; my father used to grow a little, but never much, the principal part of the seed which he had of you, was for my brother who lived at



*Hinckley*, in *Leicestershire*, where he cultivated it to great advantage, but he went to AMERICA soon after my father's death:—he took with him a large supply of the seed that he had saved, from what came originally from thee, and I had a letter from him only a few days ago, in which he says, he cultivates it in the neighbourhood of *New York*, and that it is much used for the table, coming in earlier than the bect, which is in great request there.

“ A pint of the seed that my father sent for, I had, and sowed about an acre of it, on some land that I had in a *very exposed situation*, in *Derbyshire*; which, though the plants did not arrive at the size they would on better land, were a very beautiful crop, and the wonder and admiration of every one that saw them; nothing of the kind having been grown in that part before.”

J. B. SCANTLEBURY.

#### CULTURE.

The first object, with a view to produce, should be to keep the ground in such a state as will enable it to produce good crops, and to bear in mind the old remark, that--

One year's good weeding,  
Will prevent seeding:  
But one year's seeding,  
Makes seven years' weeding!

About the beginning of April the ground should be well dunged, and *deep* ploughed, at least twice over, thrice would be better, and cleansed by harrowing, so as to leave the surface fine: this should be done, as near the time designed to sow as can be. It is proper

to form a germination before the seed is sown by steeping it in soft pond water for twenty-four hours. The seed is best drilled, or dibbled, in rows, full eighteen inches apart, and *must not* be covered *above three quarters of an inch deep*, a light bush harrow carefully drawn by the hand, over the surface, to cover the seeds, or a new light birch broom (a new broom sweeps clean) drawn over in the like manner, will be the best method to secure the seeds from the birds and vermin. As soon as the plants make their appearance above ground, give them a hoeing with a carrot hoe, to kill the weeds, and a second, when the roots are about the size of a radish, with a turnip hoe: should there not be a full crop, the plants at this time may be transplanted to fill up the vacancies—the last hoeing should be done carefully, leaving the plants full eighteen inches apart each way. Transplanting this vegetable is not advisable, only where it is required to fill up the vacant spaces, as all tuberous rooted plants do better *not* transplanted.\*

During the summer, the tops may be stripped off, and given to cows, &c., taking care to preserve the middle leaves on the crown, to form another head.

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\* A bulb is compared to a bud under ground, producing shoots from its middle or sides, the bulbs of the crocus, or hyacinth, is not properly the root, but a part of the stem; the fibres are the proper roots. The carrot, turnip, potatoe, and *Mangel Wurzel*, are tuberous roots, for these have eyes formed on the surface, which particularly distinguish them from bulbs properly so called.

*The quantity of seed required for an acre is*

If broad-cast	-	-	-	4 lbs.
If drilled	-	-	-	3 —
If dibbled	-	-	-	2 —

The best method is drilled, or dibbled, if dibbled it is advisable to fix a shoulder, or stop to the dibble, to prevent the holes being made deeper than required:— as the seeds, or capsules, have two or three kernels in each, it will require care to thin the plants out singly.

## SEASON FOR SOWING.

The seed should be sown, if on an extensive scale, at twice, the first about the middle or end of April, the second from the middle to the end of May; I have known good crops from seed sown in the second week of June.

## CALCULATIONS.

A pound of good seed, is calculated to contain about 22,000. An acre of land, in eighteen-inch rows, the plants twelve inches apart, would contain 29,040 plants, if the roots weighed one pound each, on an average, there would be thirteen tons; if they weighed ten pounds each, 130 tons. These latter would furnish nine hundred weight, forty-eight pounds of well grained white powder sugar, and 231 gallons of rectified spirits, besides the green leaves afforded for cattle, and the dregs after distillation for pigs.

One hundred weight of roots cut into small pieces for cattle, measures two bushels—the quantity therefore may be estimated at 2000 bushels per acre.

## CAUTION.

To guard against the many *spurious kinds* of Mangel Wurzel, of which this country now too much abounds, and which has hurt the reputation of the *true*, it is necessary to describe that most deserving of cultivation. It is in shape, and when growing, something like the long pudding turnip, the colour red without; and within, when cut transversely, it should exhibit circular rings, as it were, of red and white alternately—*this should be remembered is the TRUE.\**

A *yellow* kind has recently been introduced into this country, but I cannot find from the many enquiries I have made respecting it, that it is held in much estimation. It is good in quality, what there is of it, but the produce per acre, as compared to the old, and *genuine* sort, is so very inferior, that it will not bear a comparison, and those who have tried it once, seldom ask for it again.

A *white* kind, has also recently been imported from the continent, which report speaks very unfavourably of, and many cultivators forbear venturing upon it, without some better trial, than has been made of it, in this country.

I advise all growers to buy no other seed than that of the *TRUE* stock of Mangel Wurzel, they may depend upon doing *well* with that—for *probatum est!*

## THE APPLICATION OF THE ROOTS.

The best method to prepare the roots for the use of

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\* *Vide* Frontispiece.

cattle, is to cut them with a sharp instrument into *small* pieces, first cleansing them from dirt, an instrument made into the form of the letter S, with a handle attached in the centre ; a bill hook, or any other sharp instrument, will answer the same purpose ; the smaller the pieces are cut, the more advantageous it is, and the cattle eat them with more avidity, and thrive the better. Milch cows, oxen, hogs, deer and sheep, will eat it readily after a few trials ; it is advisable to give the cattle a little dry fodder at the time they are eating Mangel Wurzel—two meals a day is sufficient for a cow, comprising about twenty pounds of the roots, mixed with about five pounds of hay or chaff at each meal.

The following extract, from a letter before me, must convince the reader of the great advantages, derived from the use of Mangel Wurzel, as food for milch cows.—“ On the morning of the 18th of October, two milch cows which had calved in the spring, were selected, and turned out into an over-eaten pasture, and fed every morning and evening with hay only—the milk was measured at each meal, the cream was also measured, and the butter weighed at each churning ; and the result was as follows for one week :—

Milk	-	-	-	101	quarts
Cream	-	-	-	5½	—
Butter	-	-	-	4½	lbs.

The cows remained in the same pasture another week, and were fed with Mangel Wurzel, and hay, each cow having half a bushel of the root sliced, and

given to them morning and evening, the result was :—

Milk	-	-	-	130 quarts
Cream	-	-	-	8½ ———
Butter	-	-	-	6¾ lbs.

The cows remained in the same pasture one week more, and were fed every morning and evening with hay only, as first mentioned, and the experiment produced only

Milk	-	-	-	87 quarts
Cream	-	-	-	4¾ ———
Butter	-	-	-	3½ lbs.

The same two cows, and eight other milch cows, have been feeding on Mangel Wurzel, hay, and straw, for six weeks past, and they are all doing very well.

#### TO PRESERVE THE ROOTS.

Choose a dry day, in October or November, and take up the whole crop, strip off the leaves *with the hand*, and give them to the cattle, or plough them in the land for manure. If the stock of roots be considerable, and they cannot be deposited in the out-house, it is necessary to cause pits, or trenches, to be dug in the same field, or in the rick yard, which during winter may be secured from rain and frost; take the precaution of clearing them from all the earth which surrounds them, and deposit them carefully in alternate layers with *dry straw*, till you reach the height you require, then cover them well with straw, and throw upon that straw three feet of the earth, which has been

dug out of the pits:—then beat this earth well down, and form it into such a shape, with shelving sides, that the water may run from it more easily. In this way the roots may be preserved from the month of November to July.

#### PRODUCE AND USE OF THE LEAVES.

The *Abbe Commerell* says, in a good soil, the leaves may be plucked off the roots every twelve or fifteen days. I have remarked, more than once, that, in the space of twenty-four hours, the leaves grow nearly two inches and a half in length, and one inch and an half in breadth, and also, that at the second gathering, they have been from twenty-eight to thirty inches in length—the account will appear exaggerated, till experience shall have demonstrated its truth. Oxen, cows, and sheep, readily eat these leaves; they nourish them, and they are even fattened by them,—they are given to them entire, as they come from the field. Poultry will eat them when cut small, and mixed with bran: even horses will like these leaves very well, and may be fed with them during the summer; nothing more is necessary for this purpose, but to cut them *small*, with an instrument. The leaves of this root will also afford to *men*, an wholesome and agreeable food; they have not an earthy taste, like beet; their taste resembles that of the *Cardon d'Espagne*, and they may be eaten in the same manner—they may be dressed in different ways; they are considered as a kind of spinach, and are preferred to it by many persons. They may be eaten from the spring to the month of November; by their continual re-production, and great abundance, they are highly useful to farmers, to country

people, and in all houses in which there are many servants: the leaves, which the roots, when kept in a cellar, produce during winter, are very tender, and very delicate in side dishes. I never knew (says Dr. Lettsom) any person that once tasted the leaves, without wishing for a repetition of the pleasure; they have preferred it to spinach in taste, at the same time it appears to be much easier in digestion, which renders it in a medical point of view, applicable to the weak, the hectic, and consumptive; these are chiefly restricted to a vegetable diet, and every article that enlarges the catalogue in this department, lessens the restraints, and thereby augments the comforts of existence: the stalks and ribs of the large leaves, divested of the leafy part, and peeled, eat like asparagus; or may be used in soups, which they greatly improve.

The leaves tied up in a bag or net, with slices of meat interlaid, and boiled, make a dish both pleasant and salutary, or with plumbs, damsons, sliced apples, quinces, &c., afford a diet that is highly esteemed by many. How many families in possession of little gardens, often abounding in weeds; who, with less trouble than is necessary to clear them away, might dine once a week upon this salutary vegetable! How many are there, with a little tract of land, scarcely sufficient to feed the cow, which is to supply the family with milk, might compensate the deficiency of a dry summer, by covering a part of the land with Mangel Wurzel! How many persons in affluence, by devoting a space of ground to raise this prolific vegetable, might supply their *poor* neighbours, in hard winters, with its roots and leaves, which seasoned with a morsel of



meat, would afford a pleasant and plentiful nourishment :—

For dainty food the poor can ne'er afford,  
 Unless, in lawless plight, they seek to steal—  
 Of good coarse cheese, and root from garden hoard,  
 With sweet brown bread, and wholesome milk beside,  
 And then—as smiles content—an humble pray'r  
 Of gratitude to God—for such their fare.

MORT.

#### ADVANTAGES.

The keeping of a cow will greatly contribute to the felicity of the family of the labourer and the mechanic. He who has not hitherto been able to feed one, may easily in future enjoy this advantage; let him rent but a little spot of ground, and there cultivate the Mangel Wurzel, and he may keep his cow; and the milk which she will produce, in less than a month, will pay the rent of his ground—the peasant who has hitherto been able to keep but one cow, will be enabled to keep two or three, if he will apply himself to the cultivation of this root. As it is not attacked by the caterpillar, or by any other insect, its success is certain every where: it suffers nothing from the vicissitude of the seasons—turnips do not possess these advantages; the leaves afford an excellent food during four months in the year: whilst turnips produce leaves only once a year, and even then are tough, and injured by insects.

#### TO RELIEVE CATTLE WHEN HOVEN.

As cattle and sheep will sometimes become *swollen*, or *hoven* by eating too voraciously of Mangel Wurzel, I will state the following simple, but effectual method,

which was some time ago communicated to the Society for the Encouragement of Arts, &c.

This is effected by an instrument formed of a knob of wood, turned in a lathe, suitable to the size of the species of animal to be relieved, and fastened to the end of a rod of common cane, six feet long for cattle, and three feet long for sheep, which is thrust down the throat to remove the obstruction at the entrance of the paunch. The shape of the knob in this instrument does not appear to be most judicious. It is much too thin and sharp at the edge. The oesophagus is apt to be rent longitudinally by rude treatment: if, therefore, wood be at all proper in this case, it ought to be egg-shaped, with part of the larger end cut evenly off, which would be found a much safer instrument, whether in passing down, or returning, than that which is recommended to the Board. But the soft ravelled end of a rope, as described by MR. MARSHAL, in his 'Minutes of Agriculture in Surry,' is perhaps better calculated than either, to answer the purpose, and without the smallest danger to the tender organs to which it is applied. MR. LOUDON (speaking of the hove, or blown in cattle) says:—"It is observed to be more frequent in warm weather, and when the grass is wet. When either oxen, cows, or sheep, meet with any food they are particularly fond of, or of which they have been long deprived—they eat greedily, and forget to lie down to ruminate, by which means the first stomach, or paunch, becomes so distended as to be incapable of expelling its contents. From this inflammation follows, and the stomach either bursts, or, by its pressure on the diaphragm, the animal is suffocated. The situation of the beast is

known by the uneasiness and general swelling of the abdomen."

DR. WHYATT, of Edinburgh, is said to have cured eighteen out of twenty hosed cows, by giving a pint of gin to each. Common salt and water, made strongly saline, is a usual country remedy.

When the disease has existed a considerable time, or the animal has become outrageous, or the stomach so much distended with air, that there is danger of immediate suffocation or bursting, in these instances the puncture of the maw, must be instantly performed, which is called *paunching*. This may be done with the greatest ease, mid-way between the ilium, or haunch bone, and the last rib of the left side, to which the paunch inclines: a sharp penknife is frequently used. As soon as the air is perfectly evacuated, and the paunch resumes its office, the wound should be carefully closed with sticking plaster, or other adhesive matter.

#### THE CHOICE OF ROOTS FOR SEED.

The time for gathering in the crop is the season for choosing those roots which are proper for producing seed; and those are best for this purpose which have attained only a middling size, which are smooth, even, and of a rose colour without, and marbled with red and white within side;\* such are the marks, which distinguish those which it is proper to preserve and cultivate—those which are all white, or all red, are either degenerated, or are real beets. The roots, which are intended for the production of seed, should

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\* *Vide* Frontispiece.

be kept separately from the others, in a place where they are secured from dampness and from frost.

#### SEASON FOR REPLANTING ROOTS FOR SEED.

At the beginning of April, those roots ought to be put into the ground which are intended for seed; they should be placed at the distance of three feet from each other; as their stalks grow from five to six feet in length, it is necessary to give them props of seven feet in height, sunk a foot and a half into the earth; these props should be interwoven with small rods, and should form a kind of hedge row. Against this hedge row the stalks should be tied, in proportion as they extend in length, that they may not be broken by the wind.

#### MANAGEMENT OF THE SEED.

This seed commonly ripens towards the middle or end of October; it should be gathered immediately after the first white frosts appear; then the stalks should be cut, and if the weather will permit, they should be raised up against a wall, or palisade; if the weather be bad, they may be tied together in parcels, and hung up under shelter in an airy dry place, till they are well dried, the seed may then be stripped from the stalks by the hand, which is the better way, than threshing out the seed, as some do, whereby the seed is broken and injured—the seed may then be preserved in bags, as is done by other garden seeds. Mice are particularly fond of Mangel Wurzel seed, caution is therefore necessary to guard it from them.

TO PREVENT THE TRUE STOCK FROM  
DEGENERATING.

The seed of the root of Mangel Wurzel degenerates, like all others, if care be not taken to change the soil every year, or at least two years ; that is, to sow in a firm soil that which has been produced in a light and sandy soil, and *vice versa*. Thus the cultivators of the two kinds of land, by every year changing their seeds, will afford to each, a reciprocal benefit.

EXHAUSTION OF SOIL.

The melioration of the soil by turnips, is supposed by some authors, to proceed from the thickness of the foliage of such crops preventing a too copious evaporation from the surface of the ground ; whilst others have ascribed it to their leaves overshadowing the soil, and as the putrefactive process of vegetable recrements proceeds best in damp, and confined air, they suppose the soil may thus be improved ; this may also be implied to Mangel Wurzel.

MR. TULL,\* the father of the drill husbandry, attributes it to the ground where the plants are cultivated, being, usually, once or twice hoed, and thus in effect to have been followed by the repeated aeration and pulverization of the soil, and the destruction of innumerable weeds.

DR. DARWIN is of opinion, that not only all the circumstances above mentioned may contribute to

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\* *Mr. Tull*, expended a good estate in the prosecution of his favourite tenets, and ended his days in penury.

produce that effect, but also, as it appears by the experiments of PRIESTLY and INGENHOUSE, that though the perspirable matter of vegetable leaves gives out oxygen in the sunshine, yet that it gives out carbonic acid in the shade; which even in the aerial or gaseous form, is much heavier than common air, and will therefore subside on the earth in the shade of this perspiring foliage, and contribute to enrich the soil by the hourly addition of carbon.

Every farmer must well know that all crops are generally divided into two kinds—those that exhaust and impoverish the soil, on which they grow; and those that ameliorate and improve it. The first are fibrous rooted plants, as wheat, barley, rye, oats, &c. the second includes all the luminous and tap rooted tribes, as beans, peas, tares, mangel wurzel, turnips, carrots, parsnips, &c. and much depends on the judicious interchange of these different crops. Every farmer is well acquainted with the stimulative powers of the dung cart, and the *good* effects arising from *good* farming, are visibly discovered in *good* crops; and I need only add, that Mangel Wurzel will amply repay every expence of the finest culture.

MR. SINCLAIR, in his *Hortus Gramineus Woburnensis*, has given an analysis of the impoverishing principle of different vegetables to the soil, from which I select the Mangel Wurzel, the Swedish turnip, and the common field turnip:—

	Green Food.	Nutritive Matter.
MANGEL WURZEL, produces upon a suitable soil, on an average, <i>twenty-five tons</i> of green food per acre, every pound weight of which contains 750 grains of nutritive matter.	56,000 lbs.	3120 lbs.

SWEDISH TURNIP, produces on favourable soil, on an average, *thirteen tons*, per acre, a pound weight of which affords of nutritive matter 440 grains. }  
 Green Food.      Nutritive Matter.  
    lbs.     lbs.  
    29,120 . . . 1830

THE COMMON FIELD, OR WHITE TURNIP, affords from a sandy loam, upon an average, per acre, *sixteen tons* of green food, a pound of which contains 320 grains of nutritive matter. }  
    35,840 . . . 1638

If a plant, therefore, impoverishes the soil in proportion to the weight of vegetable substance it produces on a given space of ground, the following will be the order in which the plants just mentioned exhaust the land.

Mangel Wurzel	. . .	25	} The proportions which they bear to each other with respect to weight of produce.
Swedish Turnip	. . .	13	
White Turnip	. . .	16	

The effect of some plants (says MR. SINCLAIR) are only to impoverish the soil for an immediate succession of the same plant; while others have the property of exhausting the land, not only for an immediate succession of themselves, but likewise for every other kind of vegetable.

SIR H. DAVY gives the following account of the nutritive product of the following plants:—

The quantity analysed of each sort, 1000 parts.	Whole quantity of soluble or nutritive matter.	Mucilage or Starch.	Saccharine matter or Sugar.	Gluten or Albumen.	Extract, or matter rendered insoluble during evaporation.
Mangel Wurzel	136	13	119	4	
Swedish Turnip	64	9	51	2	2
White Turnip	42	7	34	1	

“Much food is in the tillage of poor; but there is that is destroyed for want of judgment,” says the

wise man, and we are informed by *PLINY*, that *Furius Cresinus* out of a small piece of ground, gathered much more fruits and profits than his neighbours did out of their great and ample possessions. This excited their envy and hatred against him; insomuch, that they accused him of having by sorcery, charms, and witchcraft, transported his neighbour's fruits and fertility into his own fields. For this he was ordered by *Spurius Albinus* to answer the charge. He therefore fearing the worst, at the time when the tribes were ready to give their voices, brought into the court of justice his *PLOUGH*, and other rural instruments belonging to agriculture, and placed them in the open face of the court. He set there also his *daughter*, a lusty strong lass and big of bone, well fed and well clad; also his *oxen* full and fair. Then turning to the citizens of Rome; "My masters" (quoth he) "these are the sorceries, charms, and all the enchantments that I use. I might also allege my own travel and toil, my early rising and late sitting up, and the painful sweat I daily endure. But I am not able to present these to your view, nor to bring them with me into this assembly." Which when the people had heard they unanimously pronounced him '*not guilty*;' and he was highly commended by all persons for his integrity and industry.

#### PLANTER'S TABLE.

Shewing how many plants may be placed on an acre of land, at various distances apart.

*An acre contains :—*

- 4 roods, each 40 rods, poles or perches
- 160 rods, 16 feet and a half each



4840 square yards, 9 feet each  
 4,3560 square feet, 144 inches  
 174,240 squares of 6 inches each, 36 inches  
 6,272,640 inches, or squares of 1 inch each.

Shewing how many plants may be placed on a rod of land, at different distances.

A rod of land contains  $272\frac{1}{4}$  square feet, or 39,204 square inches—a rod will therefore contain :—

Plants	Inches asunder	Square feet to each
2450 and 4 inches over	4 by 4	16
1960	5 by 4	20
1633 and 12 over	6 by 4	24
1089	6 by 6	36
816 and 36 over	8 by 6	48
612 and 36 over	8 by 8	64
490 and 4 over	10 by 8	80
392 and 4 over	10 by 10	100
272 and 36 over	12 by 12	144
261 and 54 over	15 by 10	150

*An acre will contain :*

Plants	Feet asunder	Square feet to each
43,560	1	1
21,780	2 by 1	2
19,305	$1\frac{1}{2}$ by $1\frac{1}{2}$	$2\frac{1}{4}$
10,890	2 by 2	4
8,712	$2\frac{1}{2}$ by 2	5
7,261	3 by 2	6
	1 2	

*Value of plants on an acre of land.*

Plants		<i>d.</i>	<i>£.</i>	<i>s.</i>	<i>d.</i>
19,360	at	$\frac{1}{4}$	}	20	13 4
9,680	at	$\frac{1}{2}$			
7,000	at	2		62	8 8
1,000	at	1		4	3 4
5,000	at	$1\frac{1}{2}$		10	8 4

*Comparison of acres of land.*

English acre	0,7929
France arpent, 100 perches 22 pieds	1,0000
Spain fanega	0,6720
Saxony morgen	1,0842
Naples moggio	0,6546

## APPENDIX.

*Cambridgeshire* stands unrivalled for its butter and cheese. Mr. Loudon says, "the butter most esteemed in London is that of Epping and Cambridge. It is brought to market in rolls from one to two feet long,\* weighing a pound each. The *Cambridgeshire* butter is produced from the milk of cows, that feed one part of the year on chalky uplands, and the other in rich meadows or fens, it is made up into long rolls, and generally salted, not cured, before brought to market. By washing it, and working the salt out of it, the London cheesemongers often sell it at high price for fresh Epping butter, and the Suffolk and Yorkshire butter is often sold for that of *Cambridgeshire*."

*Mr. Banister* (in his 'Synopsis of Husbandry') says the greatest mart in England for Welch cattle, is *Barnet*, the number of horned cattle, Welch, Scotch, Irish, and English brought for sale to this fair is often computed at *twenty thousand*, the fair is held annually on the 4th of September, almost solely for this business. This fair was formerly kept at *Islington*, till the distemper, which raged violently among the cows at that place in 1746, obliged the Welchmen to remove to *Barnet*, where it has been continued ever since. Such bullocks which are not sold at this fair, are driven into the home counties, particularly *Kent*, *Essex*, and *Cambridgeshire*.

It is of consequence to the farmer and grazier to be

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\* What is brought to Cambridge is rolled out to a yard in length, being more convenient for the college butlers, who serve it out, in what they term *parts*, or *tranches*

able to form a proper judgment of the value of the cattle he is about to purchase; and from the appearance of the stock when lean, to give a near guess what weight they will arrive to if properly fattened. Mr. Loudon has given the criteria of a beautiful cow, according to Wilkinson,\* thus:—

She's long in her face, she's fine in her horn,  
 She'll quickly get fat without cake or corn,  
 She's clear in her jaws, and full in her chin,  
 She's heavy in flank, and wide in her loin.

She's broad in her rib, and long in her rump,  
 A straight and fat back with never a hump,  
 She's wide in her hips, and calm in her eyes,  
 She's fine in her shoulders, and thin in her thighs.

She's light in her neck, and small in her tail,  
 She's wide in her breast, and good at the pail,  
 She's fine in her bone, and silky of skin,  
 She's a *grazier's* without, and a *butcher's* within.

The valley through which the Cam flows from Steeple Morden to Walton, is called '*the Dairies*,' from being almost wholly appropriated to dairy farms. And at *Soham* on the borders of the fens, the pastures are uncommonly fertile, and the chief produce of the place, is from the dairies: and cheese of an excellent quality, and very similiar, both in taste and flavour to the Stilton is made here in great quantities. At *Cottenham*, a cream cheese is made, which is rather larger than the Stilton, and by some considered of superior flavour: *Professor Martyn*, attributes this to the fragrant nature of the herbage of the commons, on which the cows are pastured, abounding with *poa*

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\* An eminent breeder at Linton, *via* Nottingham.

*aquatica*, and *pratensis*. I will add to the learned Professor's panegyric, by saying that both cheese and butter\* here, have attained a still higher excellence and flavour, and greater abundance, chiefly owing to their feeding on *Mangel Wurzel*; and this intrinsic merit, would in vain be sought for (in butter particularly,) made from any other food, how great soever may be the skill of the dairy-maid. *Cottenham common*, pastures about *one thousand* milch kine, and it offers a great treat to those who seldom witness so numerous a herd, to see the cows, on their return home, to their respective owners in an evening of a summer's day—a scene, *Blomfield* has beautifully described in the following lines:—

The clatt'ring dairy-maid immers'd in steam,  
Singing and scrubbing midst her milk and cream,  
Bawls out, "Go, fetch the Cows;"

\* \* \* \* \*

The strong press on, the weak by turns succeed,  
And one superior always takes the lead;  
Is ever foremost, wheresoe'er they stray:  
Allow'd precedence, undisputed sway:  
With jealous pride her station is maintain'd,  
For many a broil that post of honour gain'd.

\* \* \* \* \*

Forth comes the maid, and like the morning smiles;  
The mistress too, and follow'd close by Giles.  
A friendly tripod forms their humble seat,  
With pails bright scour'd, and delicately sweet.

*Cottenham cheeses*, are held in such high esteem, among the sons of *Alma Mater*, that it is customary

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\* Butter forming an important article of commerce, as well as food, the legislature has passed various statutes respecting its package, weight, and sale. The principal of these are the 36th and 38th of George III.

(particularly at christmas) for them, to make presents of them to their distant friends; and a coach or van rarely leaves Cambridge at that festive season without one.

In a letter just received (February 1st 1828) from W. HARLEY, ESQ. *Glasgow*, I make a brief extract:—“The Mangel Wurzel seed you sent me, was excellent, which I sowed in different parts of my farm, and gardens, where the soil was light and deep (and I have very little ground of that kind) but such had a very luxuriant crop. When the roots were raised, I cut off the leaves, and gave a small quantity of these to each cow, as a mixture, which they were very fond of,—the roots were laid up in a store, and during winter were sliced and steamed, with turnips, chopped hay,” &c. &c.

*The Harleyan Dairy* at Willour Bank, near Glasgow, is the largest, and most complete establishment of the kind, in the kingdom. A detailed account of which is now in the press.

Mr. H. gives a decided preference to the Ayrshire breed of cows, his stock amounts to about 200, producing on an average eleven English quarts of milk each, per day. Mr. H. has favoured me with a prospectus of his forthcoming work, entitled, “*The Harleyan Dairy System*,” in which, Mr. H. says:—“Among the numerous undertakings that have been planned, and carried into effect by individuals within the last twenty years, there are few or none that have met with more general approbation, or that promise to be more extensively beneficial, than the improved dairy system, originally projected and gradually brought to perfection at the celebrated establishment of Willour Bank, near Glasgow. For a long time

this dairy was an object of almost exclusive interest to every visitor of the west of Scotland, from the prince to the peasant; but more particularly to agriculturists and others engaged in plans of similar improvement. Farming Societies, and the members of various patriotic Institutions, both at home and abroad, became interested in its results, and on numerous occasions availed themselves of the experience of its proprietor to improve or ameliorate their own system.

At the special request of the directors of the Caledonian Dairy, Edinburgh, the author furnished the outline of the plan upon which that fine Establishment was founded, and which was preferred to all that their manager had seen any where in England.

The Highland Society too, voted the proprietor a handsome piece of plate, in approbation of the Willow-Bank System; and of so much importance did they deem it in a national point of view, that they requested him to publish a detailed account of his Establishment at the expence of the Society. That no such account has yet been published is a matter of surprise to some, and of regret with many, since it is generally admitted that the greater part of the System is *original*, and not to be met with in any other quarter of the kingdom."

DR. CLELAND, says, in his "Annals of Glasgow."—"It began with *twenty cows*, and increased to *two hundred and sixty*. At present there are *one hundred and ninety five cows* in the Establishment.—The passages, &c. are clean washed, and rubbed with white sand. The roof and walls are kept clean with white-wash.—The cows are curried daily: their skin is remarkably clear and glossy."

## CONCLUSION.

The reports from the *North of England*, in the winter and spring of the years 1826 and 1827, gave a powerful call upon the attention of the farmers to the cultivation of Mangel Wurzel; in the vicinity of Horncastle, multitudes of cattle and sheep, and many horses perished through want—farmers losing six or eight beasts, two or three horses, or twenty or thirty sheep, per week. Hay they had none, and the straw of the preceding year, was short in quantity, and defective in substance. Thousands of store sheep and lambs, reduced to mere skeletons, were either lost, or sold for a few shillings each.

In the *Midland counties*, the scarcity of fodder was severely felt, and great quantities of hay were purchased in London, and after being conveyed by water carriage into Warwickshire, yielded a profit of 3*l.* and 4*l.* per ton.

In the *county of Kent*, the turnips nearly all rotted, and those farmers only, had good keep for their ewes and lambs, who were wise enough to sow plenty of Mangel Wurzel; hay and straw, were both scarce and so unprecedently dear, that the graziers were compelled to have recourse to artificial food for their stock.

In 1826, there was a more general failure of the turnip crop throughout the kingdom, than had been remembered for many years: a greater part of the first sown, were eaten off by the fly, in their infant state; the same misfortune attended those of a later sowing, and thousands of acres fell a sacrifice to the uncommonly hot and dry weather; the long continued cold weather, and subsequent frosts of the ensuing winter,



produced an unprecedented deficiency of vegetable food, and the consequences were, that thousands of the animal race fell sacrifices to cold and hunger.

Sufficient I hope has been said upon the subject, to convince the farmer of the sterling merit, and utility, of *Mangel Wurzel*. and that he need never more complain of a deficiency of winter provision for his flocks and herds.

Since writing the above. I am assured by one of the most eminent Graziers, in the County of Cambridge, that so great are the advantages, and profit, that arise from the fattening of Stock with Mangel Wurzel, that many deem it a secret, which they wish to keep to themselves:—"but" added the said gentleman, "MANGEL WURZEL will certainly, ere long, make BEEF and MUTTON cheaper!"



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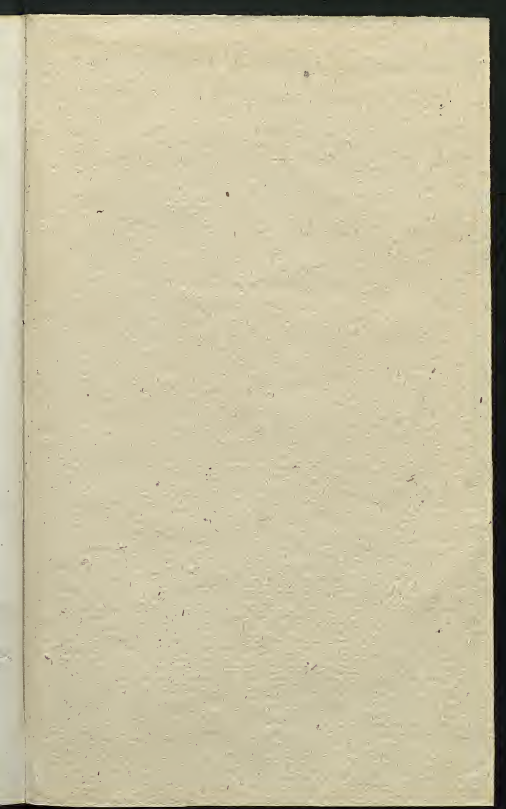
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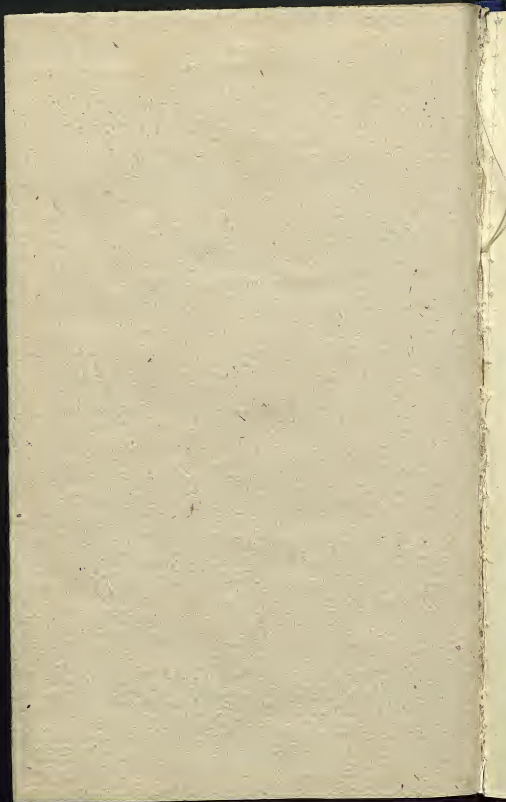
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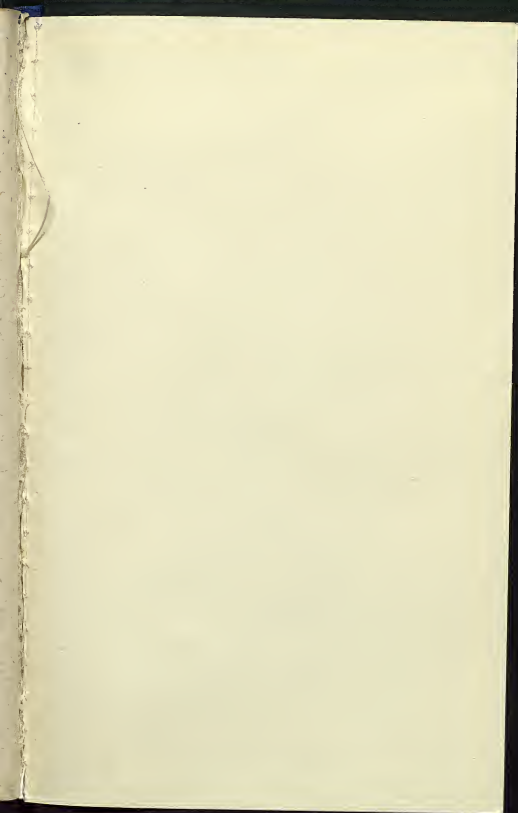
T. NEWBY, respectfully returns thanks to his numerous Agricultural friends, in England, Scotland, and Ireland, for the many favours received, and informs them, they may be supplied with MANGEL WURZEL SEED, carefully *transplanted* from the TRUE stock, on application at his residence, Bene't Street, Cambridge.

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✂ T. N. would be obliged to those gentlemen who have cultivated Mangel Wurzel, for any *new* information respecting its culture, and management; and for the results of experiments proved in its use, in feeding and fattening of stock:—such favours will be duly appreciated in a future Edition of this little work.







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