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THE

CANADIAN AGRICULTURAL JOURNAL.

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No. 3.

FREE TRADE IN FOREIGN PRODUCTIONS.

In our last we submitted some observations respecting the probable influence which a free-trade in foreign agricultural productions would have upon the agriculture of this country. We did not offer these remarks from any dissatisfaction at the present state of the law, but because we apprehended efforts would be made to change, or entirely abrogate, the Agricultural Protection Bill, that has been so lately conceded to the farmers of Canada. Such a change would, in the first place, put an end to all confidence in the duration of our laws; and, in the second place, would be a great injustice towards the agricultural class, who have as strong a claim to protection as any other class in this Province.

We object to free-trade in Agricultural produce until there is complete free-trade in all other products, and in the ships employed in commerce. Let there be an end to all protection; let the produce of the earth, and of man's industry circulate freely, and by the cheapest conveyances, whoever may be the carriers, and the Agricultural class will not complain; but they will ever complain of injustice towards them, if laws will not provide them the same amount of protection that it affords to capital and industry employed in shipping, manufactures, commerce, and trade. While the laws are not equal they must tax one portion of the community for the benefit of the other; and this has been the case in Canada during our long residence in it, up to a very late period. The Agricultural class were obliged to sell their produce in competition with foreigners, without any protection, while they had to purchase what they required from parties amply protected. In addition to this, the carrying trade to and from the Province was exclusively in British ships, the charge of freight necessarily higher than if open to foreign competition, and this could not fail to influence injuriously the price of what the farmer sold, as well as what he bought, diminish-

ing the one, and augmenting the other. We offer no objection to the state of the law, as it now affords farmers protection, but, on behalf of the class to which we belong, we protest against any partial change that would do away, or even diminish the amount of protection the law affords at present to Canadian Agriculture, unless a similar change be introduced in the law as it regards all other manufactures, trade, commerce, and shipping. British justice will, we confidently trust, make a general free trade, or none. She never will consent that one portion of her subjects shall be taxed for the benefit of other portions, as they inevitably must be, if the manufacturers of corn and cattle are not equally protected as the manufacturers and traders in silk, cotton, cloth, hardware, &c., and the shipping employed in British commerce. We may be answered, that British manufactures are now arrived at that state of perfection and cheapness, from the great amount of skill, machinery, and capital employed, that they require no protection. We will not argue this matter here, but merely observe, that if no protection is required, it would be well to begin with doing away with every protection law on the statute book in favour of manufactures and trade, before the laws for the protection of Agriculture are repealed. This, we conceive, would be the just manner of proceeding; that those who call loudly for the abrogation of laws that protect other interests, should begin with demanding the abrogation of the laws which protect their own, directly or indirectly. The protection that has been afforded to trade and manufactures has been the chief cause that trade and manufactures have been able to accumulate so vast an amount of capital, chiefly from the products of Agriculture. Whatever opinion may be entertained to the contrary, the products of Agriculture has been the chief source of support and profit to the manufacturers and trade of the British Empire. It was chiefly from Agriculture that an exchangeable product

was constantly created, that set in active motion the whole machinery of British industry. Put a stop to that annual production created by the cultivation of the land, and all manufactures, commerce, and trade on the face of the earth would be extinguished, and no longer have any existence. However Agriculture might live and prosper alone, manufactures, commerce, and trade, could have no existence independent of Agriculture. These are facts worthy the consideration of all those who despise the farmer and his occupation, notwithstanding that it is from the occupation of the farmer that they derive the means of food, clothing, and almost all other enjoyments they possess. We have often endeavoured to prove that it was the true interest of every class in Canada, to instruct, and encourage the farmers to augment the produce of the land, and improve its quality; because if the country was able to double the value of its annual productions, (and we are convinced it is possible) all classes of this community would derive advantage from the expenditure and consumption of this augmented annual production. This is a fact so evident, that we are at a loss to understand why it produces no exertion to effect this great general good. The most powerful encouragement to introduce judicious improvements in Agriculture would be a certainty of remuneration of expenditure; where this is not the case, general improvement can never go on steadily. We need not attempt to prove now, that hitherto farmers were not fairly remunerated in Canada; the effects of foreign competition, and other causes, preventing this. At present there is fair encouragement, and we respectfully recommend to our Provincial Legislature as far as it may be in their power, that this recent encouragement may be continued to farmers, and that means of instruction be furnished to the agricultural class generally, that they may be able to make the most of the advantages which the present state of the law affords them.

IMPROVEMENT OF AGRICULTURE.

We beg to offer our acknowledgements to the friends of this Journal, who have kindly paid up their subscriptions, and expressed their approbation of our humble efforts to promote the interests of Agriculture. If it were not for this flattering encouragement we occasionally receive from respectable individuals, we believe we should have long since given up the publication in disgust. At

all events, were its expenses to depend upon the support of farmers in the district of Montreal, their subscriptions would not pay for one number of the twelve published annually. We will not attempt to account for this strange circumstance, but will leave it to be accounted for by those who subscribe to our Journal, and read it. No doubt there are many farmers who consider themselves so perfect in the art of Agriculture that they would not condescend to read information on the subject from the first authority that ever existed. We would say to such farmers—Instruct others in the art you understand so well. You have been taught in consequence of some favourable circumstances that have not been the lot of others. There is public money appropriated by the Legislature that will enable you to instruct and encourage the ignorant, if you judiciously apply it to that purpose without incurring any expense to yourselves. You do not want instruction for yourselves, nor public rewards for doing what you are perfectly convinced is your profit and advantage to do. Look to the general state of Agriculture in your parish or county. See where instruction and encouragement is most wanted. Let your efforts be directed to impart that instruction and encouragement. This course will not diminish your own prosperity, and you will have the satisfaction of perceiving the happy results of your endeavours to promote the general good. You may suppose that if you are able to have a large production while all other farmers have a small production, it would be your interest it should continue so. But however this may be in your particular case, it must be for the general interests of the Province that the amount and quality of her productions should be augmented and improved. There cannot be a doubt that a country yielding annually ten millions worth of produce must be capable of giving the means of subsistence, and all the comforts of life to its inhabitants in greater abundance, than if the country yield only half that amount of value annually. In regard to revenue also, a country yielding a large annual produce, must give a larger amount of revenue, than a poor country giving a scanty produce. Any way, and every way considered, therefore, a vast majority of this community are deeply interested in promoting the improvement of Agriculture, and the increase of its productions. In conclusion, we would respectfully say, that all Agricultural societies

throughout Canada owe a duty to the public, to do all in their power, by the judicious application of the public funds committed to their charge, to advance the improvement of Agriculture, by giving instruction and encouragement where they know it to be most required. Narrow minded men may conceive that if their own skill, capital, and favourable circumstances, enable them to receive an abundant and profitable produce, it is of little consequence to them what other farmers may be able to do. These feelings, however, should have no influence on the members of Agricultural societies, as the office they take upon them implies an engagement on their part, though not expressed in words, that they will apply all the means in their power to produce the general good intended by the Legislature, in voting money for the encouragement of Agriculture. If Agricultural societies were exclusively supported by voluntary subscription as in the British Isles, the matter would be quite different, as in that case societies might do what they thought proper with what was their own. We wish we were able to convince every man in Canada, who holds office of any description, that it will be for the good of all that the amount and value of our productions should be increased as much as it is possible, and that every inhabitant in the country would be a gainer by this augmented production.

AN IRISH FARM-YARD AND ITS APPURTENANCES.

Anxious to see something of what was to be seen in the farm-yard, I was out in the morning at 7 o'clock, but Mr. Rorko and his sons were there before me, and had finished their rounds by day-light. To describe his farm-yard is a task I undertake with pleasure, although I feel incompetent to do it anything like justice:—

It stands immediately in the rear of his house, and shaded from view, though within a few steps, by a judiciously planted shrubbery of forest and evergreen trees, it is entirely closed in, together with the hay and grain yards, all of which cover about four Irish acres of ground. There are two large gates of entrance, the one from the back part of the farm, the other from the front portion of it. At one end stands a large brick building, the mill-house, where the oats and grain and other food for his stock is ground and crushed. Here is a turnip or general root-slicer, and also a straw-cutter, together with the best and most complete thrashing machine I ever saw; when the grain is fed to it in front, you have no more trouble about it; it is thrashed winnowed, the straw shaken out into a large straw shed adjoining, where a man packs it away, and the clean grain is raised by elevators into the upper loft, and deposited there for safe keeping. The whole machinery is moved by water. In the rear of the building is the grain-stack-yard, so arranged that most of it can be thrown from the stack under the shed, to within reach of the man that feeds the thrasher.

On two sides of the square, stands brick sheds with slated roofs, containing 350 milch cows, the milch of which is sent into Dublin twice a day to three hospitals (one of them the "Foundling Hospital," that takes more than half

of the whole,) which Mr. R. has supplied by contract for many years. Those cows are never let out, having a fresh supply of water constantly before them, within reach, and are led in the summer with fresh cut Italian Ryegrass, (of which Mr. R. speaks in the most favorable terms) with clover, vetches, and fresh cut common grass, alternately, and in their turn. In winter he feeds them with turnips, potatoes and mangel-wurtzel, all steamed, and also gives them some chopped straw and hay steamed, with the liquor it was steamed in and some bruised oats and barley meal, and some linseed meal cake occasionally mixed with it. You may judge from this management, the condition of the cows, and the quantity of milch they give.

Those cows are curried and brushed once a day, and the whole of the passages washed out twice every day with water and broom; the temperature is kept below 65° and over 50° during the winter. One man is allowed for every ten cows, to feed, milk, clean and attend to them, and there is no time that you cannot with comfort sit down in the shed so neatly as they kept. The feeding is done four times a day by clock work. A large clock is placed in the front of one of the buildings, within view from every part of the yard, and can be heard strike, of a mild day, at the most distant part of the farm.

Another square was occupied by sheds of a similar kind, and contained 200 heifers four years old that were fattening for the Dublin Smithfield market. Some of those were fit for market then, and we judged them to weigh on an average, seven hundred weight, or 784 lbs. each, the hundred weight being 112 lbs; by which they compute the weight here, I find. Those heifers were fed principally on hay and turnips, as much as they would eat three times a day, with an occasional change of a feed of potatoes and some linseed meal cake as they approached being finished off. No water was given them, nor did they need it, which surprised me; they were well curried twice a day, and passages cleaned and washed as the cow sheds; but each man had fifteen heifers to feed and attend to.

On another square, the milk-house standing at one end, are the work-horse stables and harness rooms, of equal finish, and as complete as the other buildings. In the centre of this square, surrounded by a three foot wall, is a large space, hollowed out in the middle, for the dung, of which waggon loads are made every day. About the middle of each building is a large cistern to receive the urine of the animals, which is pumped out and carted on to the land in carts precisely similar to those with which the streets in cities are watered.

In the centre of each building is a feeding room, in rear of which are root sheds, as well as extensive potatoe pits within the outer rick-yard wall; and in the rear of each square is built an immense rick of hay, containing, as they estimated, some forty tons each, from which, with a hayknife, is cut off fresh each day the quantity for consumption on that day. In each shed is a cattle-tube, to be used in case that any one of the stock should get choked by any of the roots on which they are feeding. It is a most useful instrument, quite elastic, and can be used without danger by any man, and gives immediate relief by pushing before it into the stomach, any obstruction that might have remained in the throat; no farmer, or at least neighbourhood, should be without one of them.

A watchman is up every night in the year, constantly going from shed to shed, to guard against fire, and give relief to any animal that might require it during the night as well as to call the men at 2 o'clock for milking. — *Correspondent of the Cultivator.*

SHELTER FOR SHEEP.—It seems desirable to furnish suitable shelter for the flock with conveniences for foddering, especially in stormy weather. Ex-Gov. King has a shed for sheep on his own farm in Kingfield, which by some is thought to be just the thing for the purpose. He has two large barns standing one on the north and the other on the west side of his yard, and sheltering it from the cold northerly winds. His shed is in the middle of his sheep yard, and extends from the barn on the west, parallel with the one on the north, and is, perhaps, eight feet long, ten or twelve wide, and ten in height. The roof is

similar to a common barn roof, inclined on both sides. There are door-ways on each side about ten feet apart, sufficiently large for the sheep to pass in and out through them. There is a passage or alley three feet wide communicating with the barn, and extending through the middle of this shed; this alley is broader upon both sides about three feet, with the exception of a space near the bottom through which the sheep can put their heads, but not wide enough for them to enter. In foddering, a forkful of hay is carried from the barn through this passage, and is placed in the furthest part of it; and so the hay is placed throughout the whole length of the alley. Meanwhile the sheep are entering through the doors, and filling up the space on both sides, where they can reach the hay; while they are unable to trample upon it, or crowd each other over it, and they are also completely out of the way of the person who is foddering them.

DO THE RACE OF PLANTS WEAR OUT?

BY PROF. LINDLEY.

(From the *London Gardener's Chronicle*.)

Is it true that when a tree or other perennial plant becomes unhealthy from old age all the offspring previously obtained from it by cuttings in all parts of the world become unhealthy too? Is such a doctrine a reasonable inference from known facts? or is it forced upon us by evidence although not deducible from mere reason? This is an important question to a labored advocacy of which pamphlets and newspapers have been lately abundantly brought into requisition. We have ourselves adverted to it incidentally, and on the present occasion propose to consider it in its various aspects.

1. No one pretends that the species of plants disappear. It is alleged on the contrary, that seeds renew the languid vigor of species as often as they are sown; and that if an unhealthy plant is multiplied from seeds the immediate offspring becomes healthy. It is also said that multiplication by seed is the only natural mode of propagation known among plants, and that all other kinds of increase are artificial and lead to debility.

It would, we think, be difficult to find an hypothesis more entirely at variance with notorious facts. That propagation by seed is a natural method of multiplication is doubtless true; but to say that no other natural means exist is absurd. The Sugar-cane is rarely propagated by seeds; its natural mode of propagation is by the stem, which when blown down by the storm emits roots at every joint. Of this natural property man has availed himself as a means of artificially extending the plant. The Tiger Lily naturally propagates itself by bulbs, formed in the bosom of its leaves; we never saw it form a seed. The Jerusalem Artichoke naturally multiplies itself by its tubers, which are bodies of the same nature as the so-called root of a Potato; no one ever saw it produce seed in this country. Every gardener knows that his Achimenes are principally multiplied by little scaly bodies resembling tubers, and that these are formed in such abundance as to render seed unnecessary. In short we have not space for other instances of this, the denial of which could only arise from an entire unacquaintance with common facts. These examples sufficiently show that Nature does provide other means of propagating plants than seeds, and that tubers are one of those means.

As to the assertion that all other means than multiplication by seeds lead to debility, we must ask for the proof. The wild Strawberry has been more propagated by its runners than by its seeds; and where do we find any sign of debility there? The Jerusalem Artichoke was introduced before the year 1617; for nearly two centuries and a half it has increased itself entirely by tubers, and never by seed. Does any one find debility in that plant? Couch Grass increases chiefly by its creeping roots: we wish we could adduce, at least, that one instance of failing vigor in a plant whose seeds are but little yielded. It, therefore, is not true that plants multiplied much or wholly, by other means than seeds become on that account unhealthy.

Seeds, however, are said, in all instances, to produce healthy plants. But this, like the previous assertions, will not bear exact investigation. The health of seedling depends entirely upon that of the seed. Under no circumstances will unhealthy seeds yield vigorous offspring; this is proved every day by what comes from grain debilitated by age. And there cannot be found a gardener, of any large experience, who does not know that seedlings will exhibit every diversity of constitution from health to decrepitude. Of the latter, Myatt's Pine Strawberry is a modern and striking instance.

We, therefore, regard the whole string of propositions now examined as entirely destitute of all foundation in fact.

2. What are called the varieties of plants are said to wear out. It is maintained that vegetable, like animal life, has its fixed periods of duration, and that there is a time beyond which the debility incident to old age cannot be warded off. The inference from this is, that all the cultivated races of plants require to be incessantly renewed by seed, in the absence of which precocity they gradually become unhealthy, and unfit for cultivation.

The first person who proposed this theory was the late Mr. Knight, who, in the latter part of the last century, finding that the orchards of Herefordshire no longer contained healthy trees of certain varieties of Apple, which were said to have flourished 50 years before, and failing in his attempt to restore health to such varieties by grafting, assumed that old age had overtaken them, and that they were incurable. Thence he extended the theory to all other plants; and here and there writers on vegetable physiology, rather out of respect to Mr. Knight's great name than from any correct examination of the facts for themselves, have blindly adopted his views. But reason and evidence are alike opposed to the conclusion, which seemed to have sprung out of a mistaken application of the laws of animal life to that of vegetables, and a desire to push analogy beyond its proper limits.

All who understand the nature of plants, and the manner in which they grow, and have witnessed that incessant renewal of their vitality with which Providence has so wonderfully endowed them, would hesitate to adopt Mr. Knight's views except in the presence of facts capable of no other possible interpretation. No physiologist can separate the nature of what gardeners call varieties (of course males are not here included,) from that of a wild race. In their intrinsic qualities they are the same. It can make no difference in the nature of a plant whether it is sown by a gardener, or by winds, birds, animals, or other agents. The oak which springs up in a forest is not in the smallest physiological particular different from that which rises from the bed of a nurseryman. The Cabbages which load the waggons of a market gardener are in their essence the same as those which sprout forth from the sea-beaten cliffs of the ocean. They may be greener, or redder, more succulent and larger; but they are physiologically the same. We therefore must dismiss from our argument the word variety, which only leads to a confusion of ideas. Now, with perennial plants, whether woody or herbaceous, whether forming a trunk or a mere permanent root, have never yet been shown by any trustworthy evidence to be subject to decrepitude, arising from old age. On the contrary, every new annual growth is an absolute renewal of their vitality, in the absence of disturbing causes. Hence the enormous age at which trees arrive. A thousand years is still youth to a forest tree which no accident has injured: and there is no intelligible reason why they should not grow to eternity. It is very true that plants do in reality perish commonly without attaining any such longevity; and that constitutional feebleness is notoriously one of the accompaniments of advancing age. But this arises from external, not intrinsic, causes. The soil which surrounds them is exhausted, their roots wander into uncongenial land, water in unnatural excess is introduced, the food they require is withheld, violence rends them, men mutilate them, severe cold disorganizes them, and these and other causes produce disease, which may end in death. But this is very

different from dying of *mere old age*; and for practical purposes, it is most material to draw the distinction.

If no evidence exist to show that *wild* plants suffer from mere old age, we cannot admit such a property to be incident to those which are cultivated. It would indeed be a waste of space to dwell further upon this part of the argument.

What are called facts, the real value of which we shall presently discuss, have been adduced to prove that if plants do not die of old age in a wild state, yet that they incontestably do wear out when artificially multiplied by division. In opposition to this it is sufficient to quote the *White Beurro Pears* of France, which French writers assure us have been thus propagated from time immemorial and which exhibit no trace of debility; or the *Jerusalem Artichoke*, already named; or the cultivated *Vines*, of which the very varieties known to the Romans, have been transmitted by perpetual division, but without deterioration or decrepitude, to our own day.

Although we regard the notion that *races of plants wear out*, as utterly baseless and visionary, we are by no means opposed to certain conclusions at which writers adopting that erroneous hypothesis, have arrived. We admit that their statements are in many instances correct. We have nothing to offer in the way of objection to their experiments: it is only against their false reasoning that we are obliged to protest.

Mr. Knight found that diseased apple trees produced diseased descendants, and that the evil of the parents went onwards to their children from generation to generation; and therefore he concluded that the apple trees were dying of old age.

A writer of elaborate articles in the *Morning Herald*, Mr. Townley, infers, because the gooseberry growers of Lincolnshire, find the weight of their fruit diminishes, "after the varieties have been cultivated some time," that, therefore, these varieties are dying of old age—and he has expended no inconsiderable quantity of learning in attempting to fit this speculation to the Potato. So impressed, indeed, is he with a conviction of its truth, that he recommends people to be sent to Peru, or wherever else the Potato grows wild, in order to get seeds and tubers of vigorous wild-plants. And all this is imitated by a shoal of persons who catch up the idea, and forthwith write letters to newspapers, or men in office, or rush into pamphlets, with all the complacency which invariably attends an ignorance of facts, or even of sound principles.

It is very singular that not one of these writers who have of late been fatiguing the public eye, should have perceived that the very few facts on which they rely, are susceptible of a much more simple interpretation than that given by Mr. Knight and caught up by themselves. It is marvellous that they should have imagined that the common sense, (to say anything of the science,) of the intelligent cultivators of the present day, should accept for truth such an extraordinary exhibition of false reasoning. One would think that all death or disease was exclusively the consequence of old age.

It has been well known from all antiquity that if vigorous children spring from vigorous parents, so also is a diseased and debilitated progeny the sure issue of parents weak in body and mind.

The obvious interpretation of the apple tree and gooseberry bush cases, which have so perplexed the minds of the little patriots of our day, is this: a tree is allowed, from some cause or other, to become unhealthy; a part cut from it and put upon another tree, carries its disease with it; when again divided, the disease is again propagated; and this will go on so long as the unhealthy plants remain exposed to the circumstances which originally caused their bad health. But, when these circumstances—keep off the cause of the evil, and the evil will gradually disappear, as has actually happened in the instances mentioned in our last, which are a conclusive answer to the whole wearing out hypothesis.

These are the just views of Mr. Garden, of Glenac, to which we alluded last week. "We may find a tree," says this gentleman, "raise species, of diseased plants, and employ these as the seed (sets) of the next crop. Nothing

can be more manifest than that the offspring of diseased parents will participate in their disease, and even be incapable of cure, or of becoming the seed of a healthful crop on any soil. * * * It is evident that diseased plants may be more easily cultivated on a healthful and fresh soil than on one which is diseased and run out. * * * But the *abundance and healthfulness* of the crop are two very different things. It is well ascertained that seed potatoes (sets) taken from fields where potatoes have been seldom cultivated, are less liable to fail than those raised on fields which have produced many potato-crops. The latter forced in diseased or exhausted fields, are unfit for seeds (sets) in any situation."

Nothing can be more true. The health of the potato crop is not with any certainty to be increased by raising new varieties from seeds. The result of that operation may be better or worse, according to the health or constitutional peculiarity of the individual from which the seeds were gathered, or according to the way in which those mysterious influences which cause constitutional difference operate while the young seedling is passing through the processes of organization. We all know that some seedlings are tall, others dwarf, some early, others late, some robust, others delicate, some extraordinarily rich in starch, others deficient in that product; and we can never tell beforehand, with any certainty, what peculiarities a given seedling will possess. The idea, therefore, of renovating the potato crops of Europe by raising them from seed, is a dream. What is really wanted, and what *must* be better attended to, is the renovation of the crop by a skilful cultivation of the potatoes we already have.

What we, then, would advise potato growers to do, is not to indulge in a vain hope that seedling potatoes will be any better than what they now have; but to adopt the practice of raising potatoes for sets upon a different principle from those for the table. To treat the latter as they now do, but to grow the former in poor, light land, where there shall be no excessively rapid growth, and no great produce, but yielding small, compact potatoes, thoroughly organized, thoroughly ripened, and therefore thoroughly healthy—will be a guarantee of all the freedom from disease, which in the nature of things is to be expected, and a far more rational means of renovating the potato crop than running to Peru for seed not half so good as our own.—*English Paper.*

CORN LAWS.

We copy the following from a late number of the *Mark Lane Express*. The propositions advanced are worthy of attention, though we do not subscribe to all of them.

It is not true that cheapness and abundance are synonymous terms.

It is not true that high prices signify scarcity.

It is true that in England the price of agricultural produce and labour is higher than in other countries generally.

It is true also that all other countries differ more or less one from another in respect to the price of agricultural produce.

It is not true that where the price is lowest there is the least approach of famine.

It is nearer the truth that where the price is the highest, on an average, there is the least danger of famine, especially when that higher price, as in England, results from the attainment and possession of greater wealth.

It is not true that higher price has been produced by the "restrictive" system pursued against the importation of foreign products.

It is true, nevertheless, that the removal of all "protection" would destroy that higher price.

That higher price is the consequence of the advanced condition of the country and its greater comparative wealth.

That wealth is now represented by a sound and abundant circulating medium, and therefore will be stable and durable.

In proportion to the increase of that wealth should be the advance in the price of agricultural produce and labour.

Whatever happens to disturb this order of things tends to throw agriculture out of its true position or proper *status* in the country.

Unconditional freedom of foreign importations would do that, without at the same time securing the country from the dangers of famine.

The poorest and most backward countries are the most subject to fluctuations in the amount of their productions.

The richest and most advanced countries are the steadiest in the amount of theirs.

Perfect freedom of intercourse would render the latter liable to the fluctuations of the former, and would unsettle prices.

The greater wealth of Great Britain would extract more than the *surplus* produce of the poorer countries, because the inhabitants of those countries would be content to live on a coarser diet rather than forego the chance of obtaining that wealth.

A corn law should be framed to admit the *surplus* of any country, and *no more*.

But as other countries differ from one another in wealth—as England differs from them all—one uniform law cannot be framed so as to admit the *surplus* produce of all countries alike.

Thus the present corn law has been operative with the poorest countries only, such as Poland, Hungary, Russia, Egypt, and some few others.

It has been inoperative with respect to more advanced nations, as America, France, and some German states.

The nearer any country approaches to the forward position of Great Britain, in general improvement and wealth, the smaller would be the duty required on import to obtain the *surplus* produce of that country.

The farther removed from the condition of Great Britain any country may be, the higher would be required the duty to obtain its *surplus* produce; because the *surplus* is all that ought either to be exported or imported.

A corn law, therefore, adapted to admit the *surplus* of American produce, would admit more than the *surplus* of Poland, Russia, Hungary, and Egypt.

On the contrary, the law which admits the corn of the latter countries, prohibits that of the former.

Ireland, having a free trade in corn, has exported more than her *surplus* produce; she is therefore poor as an agricultural country.

The foundation of the prosperity of Scotch farming lies in her exporting cattle instead of corn.

The exportation of cattle must always improve the agriculture of any country.

By prohibiting the exportation from Ireland of any beyond the *surplus* of her corn produce, she would become an exporter of stock to a larger extent, and would prosper accordingly.

The rule to make a corn law obtain the *surplus* produce of any country would be this:—Take the average price of corn in such country for a given period, and compare it with the price in England; add to it all the usual costs attendant upon the exportation, then add such a duty as shall bring the price up to a point which should, on exportation, afford to the producer the *ordinary profit or price he obtains when he sells in the markets of his own country*.

This duty should be fixed for a period of five or ten years, at the end of which, if the relative position of the exporting with the importing country should be found to have changed, the duty should be re-adjusted.

Thus would a just freedom of intercourse be established between Great Britain and the other more advanced nations, whilst the poorer ones would be deterred from exporting, to their deprivation and the retardation of our own agriculture, more than their *surplus* produce.

The entire adoption of "free trade" notions with respect to agriculture would amount to a prostitution of our national position, to the throwing away of those advantages we have by the favour of providence obtained, to

the, as it were, "selling our birth-right for a mess of pottage."

TAUN.

AGRICULTURAL EXPERIMENTS.

The following letter has been addressed to the editor of the *Maidstone Journal*:—

"Sir,—During the last twelve months I have been examining the heat of the earth a few inches below the surface, for the purpose of ascertaining how far cultivation influences its temperature. Whilst carrying on my experiments, certain results have arisen, which I think may be in some degree interesting to my brother agriculturists. My first trial gave the following results:—

"Nov. 14, 1844.—Weather cloudy; wind W.S.W.; time of day, from twelve to one o'clock.
 Thermometer in the air, shaded 52 deg, Fahr.
 Thermometer four inches deep in stale ploughed land..... 48½ "
 Thermometer four inches deep in land ploughed the day before, and had rain all night..... 49 "
 Thermometer four inches deep in fresh ploughed and harrowed land 49 "

From these facts it appears that cultivation caused the temperature to rise half a degree. Of the many subsequent observations I have made. I have found the result the same, but only to the extent of one degree and a half.

"I consider it useless to trouble you with the dry detail of my several experiments; I shall therefore proceed to say that the very great benefit which arises from cultivation is to be looked for elsewhere. Indeed, I believe, it is now generally admitted that the mechanical process of moving the earth, or its cultivation, occasions the exposure to the sun and winds of the particles composing the soil, and thus acts most favourably towards the disengagement of all stale air, stale moisture, and stale gases continued with the same, and no longer congenial for the purpose of vegetation; also, it destroys the old waterways, through which a large portion of every shower of rain escapes when land has been left long unmoved.

"This is the first advantage arising from cultivation. The next is, by the great exposure of the particles composing the soil to the sun and winds, fresh air, fresh moisture, and fresh gases are thus enabled to enter into mechanical and chemical union with the soil, to be a ready store of healthy nourishment for the support of the ensuing crops. In a few words, cultivation prepares the soil for receiving and digesting food necessary for the support of plants, as exercise prepares the stomach of animals for receiving and digesting food necessary for the support of the body; wanting only, in both cases, a sufficiency of heat and moisture for perfecting the respective secretions.

"I have before shown you that cultivation raises the temperature of the soil. I will presently prove the temperature is also raised by a shower of rain.

"On June 3, 1845.—Weather fine; wind south;

time, from two to half-past two:—

Thermometer in the sod was..... 72 deg. F.

Thermometer 10 in. deep in a few

week's stale ploughed fallow,

which had much rain two days

previous..... 65 "

Thermometer 10 in. deep in fresh

ploughed fallow close by 60 "

"In this instance there is a difference of five degrees, and in favour of the stale ploughed land. The cause of this proceeds from the rain entering into combination with the dry soil beneath, and, like water thrown upon fresh-burnt lime, heat was evolved. On the contrary, the fresh moving land, having already combined with the rain-water was placed by the exposure to sun and air in the best state for evaporation, and cold followed as a natural consequence.

"A valuable hint or two suggest themselves from this—namely, that evil rather than good proceeds from moving land immediately after a shower of rain, parti-

cularly when between a growing crop, since a check from cold may be given to its vegetation. Whereas it appears, plants receiving a shower of rain derive both heat and moisture from the same, provided the soil be left undisturbed for a time, until the land has again attained that degree of dryness when cultivation may be had recourse to with increased advantage.

"Again, necessity of draining soils and situations where more moisture is retained than is required by growing crops is here proved, because if such lands be not drained, the escape of the extra water can only be effected through the means of evaporation, therefore at the loss of heat, and at the expense of great delay in the maturing of the crops, if not of their entire destruction.

"I shall now touch upon another subject—the disease in the potatoes. The same instruments, the thermometers, have exhibited one cause of the decay in the potatoes, and after this manner.

"On July 19, 1845, weather being fine and wind south-west; time, between one and two o'clock.

Thermometer in the air, and shaded..	72	deg.	F.
Thermometer 4 in. deep in the earth ..	72	"	"
Thermometer 20 in. ditto.....	65	"	"

"And on August 16, 1845, weather cloudy; wind north; time, at twelve o'clock—

Thermometer in the air shaded.....	58	deg.	F.
Thermometer 9 in. deep in the earth...	55	"	"

"We here have in August a difference of temperature from that which prevailed in July equal to 10 degrees. This suddenness change of from heat to cold, and particularly at such a period of the year, must have injurious effects. We ourselves know, from every day's experience, the consequences of such changes upon our own bodies, by producing colds from the too immediate stopping of perspiration. And may not growing plants experience something of the same kind by their vegetation being so suddenly checked. The conclusion I have arrived at is, the great want of sun throughout the summer months, the long continuance of the wind from the north and north-east—added to these, the check above stated—are quite sufficient causes of the disease now so generally prevalent. Too many gentlemen are aware that the potatoe is not the only crop which experienced injury this year, since the wheat, many fruits, and the hop, are alike deficient in what was presumed, from early appearances, would be their produce.

"It has been remarked by many agriculturists, that the potato and the wheat are found more diseased in the rich and highly manured lands than in the poor. Why is this? Because these lands were like an overfed stomach, and the difficulty of digestion from the want of heat was proportionally the greater.

"Believe me, sir,

"Yours very respectfully,

"W. BLAND.

"Hartlip, Sittingbourne, Dec. 22, 1845."

The Canadian Agricultural Journal.

MONTREAL, MARCH 2, 1846.

It may be very amusing to read the reports of experiments made in agriculture, and hear of large products resulting from these experiments. Every practical farmer knows, however, what degree of credit he should give to such statements. There is no doubt that the produce of land may be vastly increased by judicious cultivation, draining, and manuring; but all the art of man cannot increase this produce beyond what is reasonable and possible for land to yield. When, therefore,

we see reports of 78½ bushels of wheat to the acre, it creates doubt in our mind of the correctness of other parts of such reports that might be true. We do not believe that one English acre of land has ever produced in America 78½ bushels of wheat in one crop, that is (calculating the bushel to weigh 65 lbs) 5102½ lbs of wheat to the acre, besides the straw. Hence an acre would yield of pure wheat 2 tons, 5 cwt., 2 qrs., and 6½ lbs. Now it is the general opinion that a good strong crop of wheat will yield more than double the weight of straw that it will of grain. At this rate the straw on one acre should weigh at least 4 tons, 15 cwt., giving a total yield of straw and grain of over 7 tons to the acre, a yield, we hesitate not to state, which has never been produced in N. America, under any circumstances. Half this produce is a very large one, and can only be obtained by good cultivation on the best wheat soils. It would be a matter of no difficulty to provide food for the human family if even 50 bushels of wheat could be raised on one acre by the most judicious cultivation, and if half that quantity was raised on an average upon the wheat lands of Western Canada we should never have required to import either wheat or flour from the United States. We have often observed how necessary it is that reports of experiments should be stated fully and correctly, in order that they may be of any use or instruction to those who read them. We have constantly seen in these reports, most essential circumstances not taken any notice of; in fact, points not noticed upon which the whole result of the experiment may have depended. Practical farmers would not act thus in making reports, unless they wished to disguise the principal facts. Raising a crop of wheat on glass without any soil or covering, except of straw, is another experiment which, if successful, would do away with the necessity of cultivation, draining, manure, or even good soil. We might as well grow wheat upon a rock, without any cultivation, except to cover it with straw (the quantity required is not stated) as to plough, drain, and manure the best of soil in order to insure a good crop. It is well known that the principle use of ploughing, harrowing, draining, and manuring land for growing crops, is, that the crop should be able to extend its roots, find nutriment in the soil, and also find support to sustain it in an erect position. Would this be possible on a rock, or a sheet of glass? We consider the

tendency of such experiments very injurious to farmers who have not sufficient skill and experience to detect their utter fallacy. We deny that there is any "short cut" in farming well or profitably. The best experiment a farmer can ever make, is to drain well, plough well and deeply, manure sufficiently, plant, sow, weed perfectly, and harvest in proper time. Farmers may rest assured, that by this sort of cultivation and management, they will grow better crops than could be produced on the finest plate glass, or the most expensive china that ever was manufactured. We are decidedly in favour of any new and reasonable improvement in Agriculture, but we shall never copy any experiment that cannot be practicably, or profitably introduced. We can find abundance of useful matter to copy without occupying our pages with what is impracticable.

THE LATE NEWS.

The news from England, by the last packet, is not of a very encouraging nature to the future prospects of Canadian Agriculture. As we have constantly said,—if all restrictions and every species of protection be completely done away, farmers cannot expect to have more favour than any other interest or class. We fear, however, that equal justice will not be done to Agriculture, as to other interests; notwithstanding that it is the produce of Agriculture which will have to furnish means to pay the principle portion of British taxation, and support her trade and manufactures. We cannot at present understand how free trade can be established by Britain, unless other nations are content to act upon the same principle. How is it to be as regards British shipping? Are they to continue to have a monopoly of the British trade and commerce? This, however necessary, cannot be consistent with the free trade principle. If farmers are to have all the producers on earth as competitors; they certainly have a right to be able to transport their produce at the cheapest rate to market, wherever that market may be. If there is not a free trade in shipping, it will act as an indirect tax upon every article bought or sold. We have seen freight from Canada to England vary so exceedingly, as to cost three times the amount one ear that it would another. A very high rate of freight must have a most injurious influence upon the price of Canadian produce; which would never be the case, if ships were to be as free of protection

as Agricultural produce is to be. If the freight of a bushel of wheat costs a shilling, or more, instead of sixpence, or less; it would at once lesson the price of the produce of an acre of wheat to the farmer from ten to twenty shillings, according to the quantity of produce to the acre. This is a very considerable amount to be deducted from the produce of an acre, and acts as a bar to the exportation of inferior grain altogether. We have seen a barrel of flour charged from Montreal only 2s. 6d. freight to England, and we have seen the charge as high as from 6s. to 7s. 6d. per barrel. This great variation is exceedingly injurious, and the high freight much over a reasonable remuneration. It appears, in theory, a very happy state of things, if the produce of the earth, and of man's industry, was to circulate freely over the world; the experiment, however, has never yet been made, and we very much doubt if it can be practically put in general operation. If experience prove that it can, no man will rejoice at it more than we shall. We shall proceed a little further, and show that this overcharge for freight is an actual charge or tax upon a farmer having twenty acres of wheat, of from ten to twenty pounds currency, according to the quantity of the crop. Who are the parties who derive benefit from this? Certainly the country who owns the shipping; because all that wheat brings over what the farmer actually receives in the Canada market is expended in another country, and brings profit to every one concerned, until it goes to the consumer. These circumstances are not sufficiently considered by those most interested, and ship-owners levy a tax upon Canadian products for their own benefit, instead of a tax or revenue to the Government, because the laws protect them from foreign competition. Hence, it never can fail to be a species of indirect taxation in every case, where protection is afforded partially and not generally. Free trade must be general, or the greatest injustice will be done to our class for the benefit of other classes. And we have not the slightest doubt, that, after all this matter of the corn laws are finally disposed of, there will remain a degree of protection to manufactures and shipping, that will give them advantages over the Agricultural classes, and interests, that will be anything but fair. The particular circumstances of Britain, with a large amount to be provided annually for the expenses of the country, will oblige the ministry to retain indirect taxes, and they

must be upon foreign imports. But we shall not at present speculate further on the subject—time will show how these new changes will work; if they work well and fairly for all classes, that will be all we desire or wish for.

It is, at all events, perfectly clear, that if farmers here cannot find a market for their produce at remunerating prices, they must establish and encourage domestic manufactures, which will raise up, in time, customers on the spot who will exchange manufactures for Agricultural produce. This will be the inevitable consequences of the contemplated change in the laws—a consequence that will not strengthen our connection with Britain.

W A R.

The apprehension of a war, appears to occupy the public attention to a considerable degree at the present moment in our cities and towns, but we hope our Agricultural friends are free from any such apprehension. From the present enlightened state of the Christian world, it is difficult to imagine that any possible cause could arise between two Christian nations that would produce a war; and we trust that the powerful nations of Europe, have come to the resolution never again to permit the existence of a war, that would be likely to involve other nations that had nothing to do with the cause of it, in all the evils of war, if not in the actual strife itself. It is impossible for a war to take place between two great nations without inflicting much evil and injustice upon neutral powers, and endangering the peace of the whole world, and when this must be the inevitable consequences of war, we conceive it to be the bounden duty of powerful nations to command the peace, and keep it. Nations would not now desire to rob each other, as they did heretofore, and therefore there is no necessity for war. If differences should arise between nations, there is surely sufficient honour and good faith in the world to arrange these differences by arbitration, and the powerful nations of Europe owe a duty to themselves and to the world, to compel differences to be settled by arbitration, and thus enforce peace. If it were possible for two powerful nations to go to war, without involving other nations in all the danger, and ruinous consequences of their folly and wickedness, there might be some excuse for not inter-

fering with them, but that cannot be under present circumstances. England, France, and other states of Europe, are sufficiently armed now, and we hope will always continue so, to be able to command peace, and keep it. It is infinitely better, and ultimately less expensive, for a nation to support and pay an army and navy to ensure peace to themselves and others, than have to provide one to carry on a war, and we hope this will ever be the policy of the British Government, and while it is, she may laugh at the blustering and threatening of those who are so foolish as to act so. We may, however, be perfectly at ease as a Province of an empire, too powerful to be lightly assailed. There may be threatening and violent speeches, but it will be much better that the fire of war should evaporate in this way than in powder and ball from the cannons' mouth. A violent and threatening speech will produce much less evil to humanity, unless to that portion subject to the infliction of hearing it, than the discharge of a battery of cannon, or the broadside of a line of battle ships. It may be out of place in an Agricultural Journal to introduce a subject of this nature, but we have such an abhorrence of war and its consequences, that we would wish all the world to regard it in the same light. It is to maintain the peace of the world, that nations can be justified in keeping, and supporting a powerful army and navy; and while it can produce this good to the human race, the expense incurred could not be better or more beneficially employed. We pay our armed police to maintain peace and order in our cities, because it is for the good of the community it should be maintained. By the same reasoning, nations support an armed force to secure peace and order, and it will be for the good of the whole Christian world, that this peace and order should not be disturbed on any pretence whatever. Petty States may, perhaps, be permitted to fight among themselves, without producing much of the evils of war beyond the bounds of their own territories; not so with powerful nations, who have colonies and commerce all over the world, a war between them cannot fail to produce an amount of evil and suffering that is beyond calculation. But we shall proceed no farther, as we are convinced that an evil of such magnitude will not be allowed to take place, while there are nations that can command peace.

In the House of Lords, the Duke of Richmond said he was ready to prove that a farmer paying £300 a year rent, paid triple the taxes that Mr. Cobden did, notwithstanding the immense fortune the latter derives from his manufactures. Thus it is that those who agitate most violently against the Corn Laws, pay scarcely any of the taxes or burdens of the country themselves, though they make immense fortunes from the labours of the poor, obtaining this labour at too cheap a rate.

We have sent receipts to several of our subscribers for the amount of their subscriptions, but we have not yet been favoured with a reply from many of them. We would respectfully request all who are pleased to receive our Journal, to send us their subscription to assist in paying the expenses incurred. To those who have responded to our call, we offer our best thanks.

We wish it to be clearly understood that the Agriculture of Canada cannot be benefited by repealing the laws, that have imposed a duty on the importation into Canada of foreign Agricultural produce. Other interests may be served by such a change, but not the Agricultural interests. Whatever may be advanced to the contrary, we feel persuaded that while reliance is placed on the carrying trade in Canada, instead of making exertions to augment the amount of our own productions, this country never can be generally prosperous; and we are sorry to see that the most influential portion of this community are more disposed to promote the interests of trade and manufactures, than of Agriculture.

We have seen a Canada made cheese weighing near 300 lbs., at the grocery store of Mr. M'Farlane, Montreal, which he informed us was manufactured at the dairy of a Mr. M'Donald, of Glengarry or Cornwall. This cheese was the best make and quality of any we have ever seen in this country. We mention the circumstance, in order to prove what we have already so often stated, that the very best quality of cheese and butter, might be made in Canada, with proper dairies and skillful dairy women. Such cheese, as the one we refer to, would constantly bring a fair price in Montreal, for Canada consumption, at least ten dollars the 100 lbs. weight. If the contemplated change in the law will not put an

end to the exportation of cheese from this country, Canada might have a profitable trade in cheese and butter; but we fear the encouragement so lately given to farmers here, will be of short duration, that farmers cannot even try the experiment of what might be done by them in this way.

The following extract from a speech lately made at an English Agricultural Meeting, by a Clergyman, is well worthy of attention at the present moment:—

I say it will not do to depend upon protection to keep foreign corn out. We ought to come before the country and say. We are doing all we can to feed you; but we cannot give you English corn at foreign prices, with English burthens." (*Loud cheers*). But are we doing that? Do we come with clean hands to ask for protection? I think we have a claim to protection. I love farming; and think that, apart from my sacred profession, and that profession which visits the sick, there is no occupation so useful as that of endeavouring to amend the habits of agriculture among us. Now about poor lands. It is poor land that I love. I don't want your 50s. an acre land. I had some miserably poor land called Boys Knap, at Sutton: the value of it was merely nominal—1s. an acre. I have broken it up, and in this way:—Last July, some fifteen poor men from Shaftesbury came to me and begged for employment, so I told them to go and break up this land; they were to have 2d. a lug for digging it; but they could not dig it, so they were obliged to get their pickaxes, and break it up. It was very hard ground; and excepting two or three thistles which got into the rabbits' dung there was nothing to be seen (*laughter*). Now, here was a fair place to try whether I could make anything grow. The principle I proceeded on was not guess work, but certainty. If you take Swedes and burn them, they will leave a certain quantity of ashes. The portion that is left is what we call earthy element—that which is burnt the air element. Now, chemistry says to us that if we will give to certain plants their earth element, and a certain portion of air element, then it matters not about the soil: I believe and know that to be true. I determined that I would grow twenty tons of Swedes an acre, and five tons of tops. If you burn twenty tons, the result would be 500lbs. of ashes. Now, these ashes consist of more than one-half of potash, one-third of soda, one-eighth of sulphuric acid (which we get in bones), and the other one-eighth of sulphuric acid, with a little magnesia. I then got a lot of saw-dust, and put it under pigs and decayed it with phosphoric acid, for I must tell you that when once saw-dust takes it into its head to decay, nothing on earth will stop it. Now, how was I to get more potash? I got wood-ashes, and found that these wood ashes contained about 2lbs. of potash a bushel, and 2lbs. of soda. Next, I wanted to get the phosphates: these I got from 20lbs. of Ichaboe guano. The next thing was, how was I to put in the manure? My theory was to make holes about two feet apart; but there was one serious objection which kept me awake all night—how was the manure to be applied without destroying the seed, for it is so powerful it will grow no weeds between. I got some good garden mould, in which I mixed the seed and manure. The crop began to grow, but the fly got very busy, and I was afraid that after all, I was what they called "diddled." (*Loud laughter*.) Yet you know white seed will germinate three or four days before Swedes; I got some white seed, and when the plant appeared, the fly left my Swedes to go upon the white turnips, and I wished them good morning. Where the children neglected to drop the seeds upon the manure the roots were not half so big as a marble. Then about three weeks ago we took up these turnips. We weighed 19 tons and three quarters upon the lightest portions of the land, and upon the heaviest 23 and three quarters. The aggregate aver-

age was 22 tons an acre, the value of which we will now discuss. What was the cost? 30 bushels of wood ashes, 15s.; 2 cwt. of guano, 17s.—32s. For manual labour, 19s. 6d. The rent I have placed at 5s. an acre, rates and tithes at 2s. In all, round numbers, 4l. Now let us see what the Swedes were worth. I find that 112lbs. of Swedes will, on the average, put on 2lbs. of live flesh. Then the value of that at 7d. a pound, dead weight, reckoning that the live weight is to dead weight as 4 to 3, brings my Swedes to 17s. 1d. a ton. Now what is the value of the dung? I bring it to 4s. 1d., which makes it equal to 21s. 2d. But I'll take the popular value of 15s. a ton. Now for 4l. an acre I have a return of 300 per cent., and if that is not a sufficient return, I don't know what is. You see I want you to be enthusiastic. If you will only be as enthusiastic as I am, you may laugh at these free traders. We agriculturists support 27 millions of people, and our produce amounts to the enormous sum of 540 millions sterling, whilst the exported manufactured goods amount, on the average of 6 years to not quite 47 millions. Then I tell you, you must become enthusiasts. Now about the hay—that is a piece of bigotry. There is a large body of experiments carried on by the Highland Agricultural Society, and in their reports is contained the relative value of hay and grass before it is dried, and it is calculated that 1 cwt. of grass cut green will produce more milk than dried hay. You know that hay by drying loses a third portion. You make it wood by drying, and give the poor animal's stomach the trouble of reducing that wood to sugar and gum. Well, I tell you what I did; I took some straw, and upon that I put three hundred weight of vetches, and then having some salt prepared, I had it carefully sifted over them at the rate of 2lbs. to each hundred weight, and we went on adding a layer of salt to a layer of vetches until we had got a rick as high as this room. About two months ago we cut it open; nothing could be more beautiful than the smell, and the vetches were as green as when they were put in. So much for the value of salt. If you were to mix sawdust with vegetable juice and salt it would become soluble—the human stomach might eat it. Well, what's the result? I can get nine or ten tons an acre in this green state. Now, I ask you whether these things are not worth trying? By giving the animals these things we keep their stomachs in good condition, and enable them to give plenty of milk. I hope you will not make your clover into hay, but get all the straw you can, and turn your green grass into green hay, saving thereby all the juices as well as one-third of the bulk. Well, now may I say something about manure? I found sheds might be erected at 1s. 3d. a foot, and I think if we can do without the dung-heap we shall get all the ladies to see us. I have therefore had a large house erected, entirely by my own labourers, to hold at least 50 or 60 tons of manure, wherein all refuse matters are thrown; not long shaggy stuff, but in a comminuted state requiring no turning. Well, now again about your dead animals. I am afraid, sir (turning to Mr. Farquharson), after what I tell them, they will sell you no more dead horses (*laughter*). I have a very large sawpit, made of Memel timber; and if you cut a horse in half, he will lay in it easily. We throw him in, and pour sulphuric acid over him: he looks very uncomfortable, but in the course of a fortnight he is turned to a jelly (*loud laughter*). Now he's worth double his weight in guano. I am almost afraid to say it before you, sir (Mr. Farquharson) but he will grow five tons of Swedes (*laughter and cheering*.) I've talked so immensely, that I don't know that I ought to say any more; but I want to advise you not to buy any more guano. I bought last year 150l. worth; and I conscientiously believe it will be an admirable investment to buy up all the dead horses you can lay your hands on. I have laid out 2,000l. in building, and 700l. in draining; and I verily believe that by next year, charging on the whole outlay an interest of 10l. per cent., I shall clear 2l. per acre. We consumed last year 130,000 tons of guano, and next year we shall have to pay a long price for it, because there is only 10,000 tons allowed to be exported; and that is the way

these people pay their bonds (*loud laughter*). Now if you go and buy good bones, and dissolve them in three quarters of their weight of sulphuric acid, you have that weight by weight, which is equal to the best guano; because it is proved that it is identical in its composition with Ichuboe guano; and why we should go to Peru to get that which is at our own doors is what I cannot comprehend. I think we ought to reclaim all poor lands and poor pasture, and then we shall be enabled to give full employment to the labourers. After extolling the services of the labouring population, Mr. Huxtable resumed his seat amidst loud cheers; and the company then rose, and gave him three rounds of applause.

PROVISION TRADE OF LIVERPOOL.

In addition to their weekly report, we insert the following admirable summary of the provision trade of that town during the bygone year by Messrs. Adams and Banks:—

Liverpool, 29th of December, 1845.

The present year was ushered in with the highest prospects of commercial prosperity, and the realization of those prospects continued unabated during two-thirds of the year, and were blighted only by the probability of a defective harvest, and the abstraction of capital and energy from business pursuits to the share mania; the latter, however, brought the antidote with the bane, and the former, whether as regards the grain crops or green crops, are not turning out so defective as was anticipated. And although the commercial arm of this great country is at present a little paralyzed, it is not shortened. There is plenty of money in the country, the manufacturers are busily engaged, the artisans in receipt of good wages, and the mining population equally well off. The shipping interest has been doing well all this year, and still has undiminished good prospects. The agricultural population, as a whole, are better employed than formerly; and the formation of railways is finding employment for numerous branches of business, besides the superabundant labourers. Articles of food are moderate in price, and the consumption of everything enormous. Let the political horizon become settled, the corn-law question set at rest, confidence restored amongst the commercial community; enjoying as we are, a universal peace, and we may look forward to bright rather than dark spots in our commercial history, and a revival of healthy and active business as the spring advances.

It is natural that our provision trade with America, after three years' working, should be fully developed. It is not quite so with regard to swine products. It was at first expected that bacon and hams would be sent forward freely. Such has not been the case, and the expectation of a trade cultivation in these articles is much abridged. A greater business was looked for in barrelled pork, but the value of this article in America being nearly equivalent to that of Irish or Hambro', importations have been in a great measure precluded thereby; saying nothing about the disparity in quality, the American proving much inferior to the other two. However there have been some good lots of American imported, and we must not take it as a security that, because little has been done in this article this year, an extensive business is not yet to be cultivated in it. Lard has become a staple article of commerce, both for culinary purposes and pressers' and soapers' uses. With respect to beef, there can be no mistaking American superiority. The imports this year have been of uniform good quality, and nothing is now inquired for, for ship stores, but American beef. It has been

steady in price all the year, scarcely differing 5 per cent. in value. It is considered to be remunerative to the packer and exporter, as well as importer here; and the manufacture of it is now so well understood there, and has so gained confidence here, that there is no doubt of this article (equally with lard) becoming a staple article of commerce. Under a 21s. duty a trade in butter will not be cultivated; the fluctuations in this market, and the risk of it becoming greater, operates against it, but we are likely to have some extent in butter shipped as grease from the States, and an effort may be made to cultivate a butter trade from Canada. But there is a prejudice against it, and it is not likely either to be extensive or profitable. There is very little doubt about the trade in cheese becoming extensive and permanent. Some of the imports have been equal in quality to any made in England, and the ready sale this article has met with nearly all through the year, with the good prices lately obtained for it, say as high as 60s. per cwt., will tend to encourage the trade in it. A better knowledge of packing the cheese for the English market, so as to prevent loss in cutting out, is the principle thing wanted, and that will no doubt be gained in time. The imports of these articles this year has been, 14,831 tierces, 3,437 barrels, of beef; 7,713 barrels of pork; 10,471 barrels, 49,452 kegs, of lard; 5,322 casks, 43,702 boxes of Cheese. And the stocks now on hand are light of beef, pork, and cheese, but heavy of lard.

The import of foreign live stock into the kingdom increases steadily, principally from Holland, but we have no imports into this port, nor have any of the cattle been sent otherwise to this market. Considering it is now nearly four years since the passing of the tariff, little progress has been made in this trade, but a greater extent of business may be expected, as prices are sufficiently high to encourage it, and they are now in Holland preparing both cattle and sheep expressly, and well suited for the English markets. The foreign imports so far have not had the effect of preventing prices advancing in this country, as the consumption of flesh-meat has increased in the last three years incalculably beyond those imports; even in this market alone this year the quantity of stock sold more than in 1843, amounts to nearly as much as the whole of the year's import into the kingdom, which, in round numbers, may be put down at 13,000 beasts, 9,000 sheep and 700 pigs, nearly all of which have been disposed of in the south-east and west of England, which markets are likely to be those destined for foreign stock; thus leaving the northern English markets for the bulk of Irish and Scotch produce, from whence to this market this year the supply has been abundant, being 70,180 beasts and 330,307 sheep and lambs, against 66,860 beasts and 280,474 sheep and lambs, in 1844, and 61,042 beasts and 265,055 sheep and lambs, in 1843. The quality of the stock has in a general way proved good, but the epidemic has shown itself more or less throughout the year. Of the excess of stock, the cattle have come from Ireland, but the sheep from Scotland. The business throughout the year has been steady, and fairly satisfactory, changing in conformity with the seasons, and prices fluctuating also in accordance therewith, maintaining throughout about the average percentage of value over the previous year, which may be stated at from 5 to 7 per cent., leaving the top price of cattle at 6*l.*, and sheep 7*d.*, against 5*d.* for cattle, and 6*d.* for sheep, on the corresponding market of 1844. There was a great falling off in

the store cattle business between Ireland and the south of England, at the close of the last and commencement of the present year, owing to the drought of 1844, and scarcity of keep during the winter and spring months in those districts. Respecting the supplies of fat stock for the coming spring, we do not look for scarcity, as there is plenty of keep both in England and Scotland; at the same time we doubt not the consumption will keep pace with the production, and thereby cause the present full value of all descriptions of stock to be maintained, if not increased, as the spring advances.

The supply of, and demand for, pigs throughout the present year has been exceedingly good, and prices so steady, that (like cattle) they have fluctuated only with the season, and that without any great or even the usual depression in the hottest or worst curing part of the year. During the last two years they have increased more in value than any other description of meat, being now 15s. per cwt. higher than at the close of 1843, the aggregate advance being 8s. per cwt., last, and 7s. per cwt. on the current year. We have not the same confidence in pigs maintaining their value as we have of cattle, as the advance in them has been great in proportion, and at the present high prices curers will be reluctant at going heavily into stock; the supply will, therefore, in a great measure regulate the prices. Hitherto this season it has been large, but how it will continue cannot be ascertained, as in Ireland it is different in different parts of the country, according as the potato gathering has proved good, or defective, or otherwise.

The stock of butter at this time last year amounted only to about 8,000 firkins, which was gradually worked down to a mere nothing by the end of March, the price in the meantime remaining unaltered, ranging at about 96s. to 98s., so that last season ended well. New butter came forward springly, and there being no good old to interfere with it, it sold as readily as brought forward, commencing about 110s. for fine Waterford but shortly receding to about 103s. which might be considered the opening price for the season. Up to June there was very little alteration; supplies then began to accumulate a little, and a reduction of 1s. to 16s. per cwt. took place in a fortnight, making our highest quotations about 84s.; and which has proved the lowest point of the season. From June until September the trade was extensive and steady, with very little accumulation of stock; the markets now began to rally, and ever since prices in the Irish markets have been nearly as high as with us. With free buying there, the shippers looking forward rather to advantage in holding stock than regulating their purchases, so as to realize a legitimate trade profit on the transaction of the day. This course proved fortunate at the fall of last year, which perhaps led to the same measure this season, but with quite a different result; although for a few weeks it assumed the desired position, prices running up to 98s., but changed again early in November, since which they have gradually given way about 6s. per cwt., the stock accumulating, and now amounting to upwards of 20,000 firkins. The make of English butter this year has been very considerably greater than last, but has interfered very little with the sale of Irish, no doubt owing to the greater consumption generally through the country. The import this year having been equal to 372,611 firkins, against 364,680 firkins in 1844, and 359,916 firkins in 1843. Lard has been very saleable all

through the year at good prices. Bacon is now too high to engage the attention of speculative buyers, and is unprofitable to the retailers; therefore is likely to be a dull article of sale. Of barrelled pork there is no stock, and, as there is very little American coming forward, it is likely to remain saleable for some time, at about the present prices.

Nothing can be said at present about the corn trade, except that it is a great hardship for all classes connected with it to have a momentous business like it virtually suspended either by want of confidence or defection in legislative enactments. The quantity of bread stuff coming from the United States is great, so that with the bonded grain now in the kingdom, and that on the way, the granaries in England are likely to be sufficiently stored for the consumption of the country until the next harvest.

THE PROPOSED ALTERATION OF THE CORN-LAW.

The following resolution is to be proposed in committee on the Customs and Corn Importation Acts, by Sir R. Peel.

That in lieu of the duties now payable on the importation of corn, grain, meal, or flour, there shall be paid, until the first day of February 1849, the following duties.

Wheat Foreign:—Whenever the average price per quarter is under 48s. the duty shall be, for every quarter.....	10 0
48s. and under 49s.....	9 0
49s. and under 50s.....	8 0
50s. and under 51s.....	7 0
51s. and under 52s.....	6 0
52s. and under 53s.....	5 0
53s. and upwards.....	4 0
Barley, Beer, or Bigg, Rye, Peas, Beans:— Whenever the average price per quarter is under 25s. the duty shall be, for every quarter	5 0
25s. and under 27s.....	4 6
27s. and under 28s.....	4 0
28s. and under 29s.....	3 6
29s. and under 30s.....	3 0
30s. and under 31s.....	2 6
31s. and upwards.....	2 0
Oats:—Whenever the average price per quarter is under 18s. the duty shall be, for every quarter	4 0
18s. and under 19s.....	3 6
19s. and under 20s.....	3 0
20s. and under 21s.....	2 6
21s. and under 22s.....	2 0
22s. and upwards.....	1 6
Wheat, Meal, and Flour:—For every barrel, being one hundred and ninety-six pounds; a duty equal in amount to the duty payable on thirty-eight gallons and a half of wheat.	
Barley Meal:—For every quantity of pounds; a duty equal in amount to the duty payable on a quarter of barley.	
Oatmeal:—For every quantity of one hundred and eighty-one pounds and a half; a duty equal in amount to the duty payable on a quarter of oats.	
Rye Meal:—For every quantity of pounds; a duty equal in amount to the duty payable on a quarter of rye.	
Pea Meal, and Bean Meal:—For every quantity of pounds; a duty equal in amount to the duty payable on a quarter of peas or beans.	
And that from and after the said first day of February 1849, there shall be paid the following duties.	s. d.
Wheat, barley, beer or bigg, oats, rye, peas, and beans, for every quarter.....	1 0
Wheat meal, barley meal, oat meal, rye meal, pea meal, and bean meal, for every cwt.....	0 4½
If the produce of, and imported from any British possession out of Europe:	

Wheat, barley, beer or bigg, oats, rye, peas, and beans, the duty shall be for every quarter.....	1 0
Wheat meal, barley meal, oat meal, rye meal, pea meal, and bean meal, the duty shall be for every cwt.....	0 4½

ARTICLES OF AND FROM THE BRITISH POSSESSIONS.

The following are the duties proposed to be levied on articles of and from the British possessions:—

	£.	s.	d.
Arrow root, the cwt.....	0	0	6
Bandstring twist, for every £100 value.....	5	0	0
Barley, pearled, the cwt.....	0	1	3
Best ropes, twines, and strands, for every £100 value.....	5	0	0
Butter, the cwt.....	0	2	6
Cassia powder, the cwt.....	0	0	6
Cheese, the cwt.....	0	1	6
Custom goods, made up, for every £100 value..	5	0	0
Cucumbers, preserved, for every £100 value...	2	10	0
Cauze of thread, for every £100 value.....	5	0	0
Hair manufactures, for every £100 value.....	5	0	0
Hams, the cwt.....	0	2	0
Seeds, as above enumerated, only one-half of those duties.			
Soap, hard the cwt.....	0	14	0
Soap, soft, the cwt.....	0	10	0
Tallow, the cwt.....	0	0	1
Tongues, the cwt.....	0	2	0
Woollen goods, made up, for every £100 value	5	0	0

A more sweeping change in our commercial laws has never before been attempted. As regards corn and provisions, Sir Robert Peel is now endeavouring to effect that which he some time since stated to be his intention—namely, to make this country one of the cheapest in Western Europe to live in.

FEEDING CATTLE, SHEEP, &c.

At a late meeting of the Parsonstown Union Farming Society, Ireland, Dr. Waters, an eminent physician, and a gentleman of great scientific attainments, delivered a most interesting lecture on the application of physiology, or the laws of the vital functions, to the rearing and feeding of cattle. We are induced to give an extract from this lecture, in the hope it will prove highly interesting to our agricultural friends, and it certainly contains many facts worthy of their attention. Dr. Waters said—

“The subject chosen for the present lecture was the application of physiology on the laws of the vital functions, to the rearing and feeding of cattle. He did not pretend to any practical experience; in fact, he had none; but should endeavour to point out those principles upon which practice should be based, and which being once known, would enable the practice man to regulate the application of them in a way best adapted for the purpose intended.

He then entered into a description of Liebig's important discoveries in the processes engaged in the nutrition of animals, pointing out the division of the elements of food of herbivorous animals into the two classes, viz., the elements of nutrition, and the elements of respiration.

The elements of nutrition, containing oxygen, nitrogen, hydrogen, and carbon, are perfectly identical with the flesh of animals; so much so, that the most experienced chemist cannot by analysis detect any essential difference between the substance gluten or albumen, which is invariably present in all vegetable nutritious food, and the flesh or blood of an animal. Thus proving the strange fact, that the flesh and blood of animals exist, ready formed, in vegetables; and the only duty the vital functions

have to perform in connection with nutrition, is to assign a place and form in the animal to this food, which is already of the proper composition manufactured, as it were, in the laboratory of the vegetable kingdom.

The elements of respiration are those compounds from which the element nitrogen is absent, such as sugar, gum, and starch; they consist of carbon, hydrogen, and oxygen, but not containing nitrogen; they, therefore, cannot form flesh, and cannot, in this sense, be considered nutritious. The experiments of Magendie have shown that animals fed solely on these substances will die; but as they are invariably present in food, what are their uses? They serve as fuel to keep up the heat of the animal body. The bodies of our animals are always above 40 degrees over the average temperature of our climate, and the supply of heat necessary to sustain this temperature is produced by the union of the oxygen contained in the air they breathe with the carbon within the body, thus producing the same gas as if a piece of charcoal were burned in the open air—carbonic acid gas; and as a certain amount of heat is the necessary result of burning a piece of charcoal unites with oxygen within the body, the amount of heat generated *must* be the same as if such carbon were consumed in the open air, and experiment has proved that the amount of heat thus produced is amply sufficient to sustain the temperature of the animal body.

The most accurate observations have shown that the heat of the blood of animals is the same in all regions, whether at the equator or in the polar regions. The quantity of heat necessary to keep up this uniformity of temperature must obviously vary with the climate. The inhabitants of the tropics, for instance, can sustain the temperature by a less expenditure of heat, where the surrounding air equals the temperature of the body, than the inhabitant of the polar region, where air is 100 degrees colder than the body; but we find that the food in the Tropics is vegetable, containing not more than 10 per cent. of carbon or combustible matter, while the food of the inhabitants of the Polar region consists of blubber, train oil, and tallow, containing 80 per cent. carbon.

Air is condensed by cold and expanded by heat, so that the quantity of air in a given volume varies with the temperature. The size of capacity of the chest of an animal is a constant quantity, and therefore the volume of air taken in at each inspiration may be considered uniform; hence, in a cold climate more air must be taken in at each inspiration, the air being condensed, than in a warm climate where the air is expanded; more oxygen is therefore taken in, and as oxygen once taken into the system never leaves it as such, but enters into combination with carbon, so more of the latter must be supplied in cold than in hot climates. Anything, in fact, that increases the supply of oxygen, must occasion an *increased demand for food*. Exercise, for instance, increases the supply by making our respiration more rapid; we therefore consume more food after exercise, than when at rest.

Our clothing is in fact an equivalent for food. The more warmly we are clad, the less urgent becomes our demand for food; because, the loss of heat by cooling, and consequently the amount of heat to be supplied by the fuel or food, is diminished.

Two forces exist in connection with animal life—the one, vitality, the cause of life, which is always

endeavouring to sustain and increase the mass—the other, the chemical force, the gas oxygen, always present in the air we breathe, endeavouring to waste and destroy the animal substance, by entering into chemical union with the elements of organic matter. These forces are placed in antagonism. When vitality has the ascendancy, the body increases; when the chemical force triumphs the result is waste. When the chemical force succeeds in the waste of the body, it resolves it into the elements carbonic acid, ammonia, and water; but these are the very substances upon which plants subsist. Thus, we find death and destruction in one kingdom of nature, the source of life and activity in another.

Cold depresses the vital functions (the cause of increase); while, by condensing the chemical force, oxygen, (the cause of waste), it increases its power. We, accordingly, find that cattle do not fatten so well in cold as in hot weather. In fact, the animal body is a *furnace*, which must be kept up to a certain heat. The food is the fuel, the air we expire the same as the gases which pass up the chimney; and the excrements are the ashes. This furnace must, therefore, be supplied with more or less fuel according to the temperature of the external air. If, then, we wish to keep up the vital functions of our cattle in proper action, we must support the heat of their bodies, which we may do in either of two ways, viz., adding more fuel, that is food, to the furnace; or, we may keep their bodies warm. Warmth, in point of fact, supplies the place of food which we may thus economize. An experiment performed by Earl Ducie at his Whitfield Farm will place this in a clearer light.

100 sheep were folded by tens in pens, each 10 by 22 feet, having a covered shed attached 12 feet by 10. They were kept in from October to March. Each sheep consumed on the average 20lbs. of Swedish turnips daily. Another 100 were put by tens into pens of the same size, but *without sheds*; they were kept in during the same time, and consumed on the average 25lbs of Swedish turnips daily. The only difference in the treatment consisted in the former having a shed into which they could go to protect themselves from the wet and cold. This protection was equivalent to a certain proportion of food, and we find that those that were deprived of it consumed *one-fifth more food*. In the latter case, the additional quantity of food arose wholly from the necessity of adding more fuel to keep the furnace at its proper temperature. This is proved by the fact that the sheep that had the sheds increased on the average 3lbs. each more than the others.

There are many illustrations of this principle—*That warmth is a substitute for food; and, therefore, by protecting cattle from the cold, we economise food.*

The excess of those principles containing nitrogen is deposited as flesh, while the excess of those destitute of that element, as sugar, starch, &c., is deposited as fat.

The fattening of cattle is similar to the growing of corn plants; we endeavour to produce an unnatural increase of some particular part of the plant, as the gluten of wheat, and this we accomplish by artificial means—by manure. The fattening of cattle is the same. We want to produce an unnatural increase of part of the body; and we do this by putting the animal in an unnatural state.

One of the most remarkable of Liebig's theories is, "that every manifestation of force, every movement is the result of a transformation of the structure of the body or its substance." This may appear problematical in the highest degree, and yet there is no theory more easily proved by every day experience.

Poultry feeders confine their poultry when they want to fatten them, thereby depriving them of motion. Pigs about to be fattened are confined in a narrow sty, on the same principle. Mr. Childers found, in his experiments on sheep, that those fed in sheds consume one-fifth to one-half less food, and increase one-third more in weight than those fed in the open field. The cause of this is—first, the sheep in the sheds take less exercise, and therefore exhaust less food in the production of motion, than those in the field; and, secondly, the sheep in the sheds have their warmth economized.

OAT FODDER FOR HORSES.

At a discussion had at a meeting of the Darlington (Eng.) Farmers' Club, Dec. 8th, on the best and cheapest mode of keeping draught horses during winter, Mr. Trotter said—

"I have paid some attention to the subject of keeping draught horses during winter; for the last three years I have adopted quite a different mode to what I previously followed. My method formerly was to allow my draught horses each 2 bushels of oats per week, together with 1 bushel of beans and as much hay as they could eat, generally clover hay. For the last three winters I have fed them almost entirely on cut oat sheaf—cut into half-inch chaff—which has been a very great saving to me.

In an oat crop of about 40 stooks per acre, which might yield near 60 bushels, the feed of a draught horse averages 2 sheaves per day, or 14 sheaves per week, which would be about a bushel and 3 pecks per week, if they had been thrashed out, which is a saving of a peck of oats per week, each horse, from what I formerly gave them; besides, I save the bushel of beans per week, and the clover hay, which was a very considerable item. When I first changed my mode of feeding, the horses improved in condition wonderfully, thus showing that it suits them well. When they are very hard worked, I allow them half a peck of oats at dinner time besides the cut sheaf.

Last winter I had only 18 acres of oats; those kept 12 draft horses, besides four young ones occasionally. This quantity of oats would not have served me through the year, had I not pursued this system of feeding."—*London Ag. Gaz.*

FARMING.—What is there in the occupation of the farmer inconsistent with, or what does not, in fact, contribute to its dignity? If there be anything in the *origin*, or in the *antiquity* of a profession to entitle it to dignity, then surely agriculture must be thus entitled; for it had its origin in a Divine commission, and it is coeval with the race. If, to occupy a sphere of unparalleled *usefulness* and *importance* confer the title, then does it most rightfully belong to agriculture; for, says Dr. Johnson, "If we estimate dignity by immediate usefulness, agriculture is undoubtedly the first and noblest science;" and Professor Johnston, in his *Lectures on Agricultural Chemistry*, remarks—"That art on which a thousand millions of men are depending for their very existence—in the prosecution of which nine-tenths of the fixed capital of all civilized nations is embarked—and probably two hundred millions of men expending their daily toil—that art must confessedly be the most important of all." If to lie at the foundation of all the other great arts and interests of life, give dignity to an employment, then is agriculture dignified. "Perfect agriculture," declares Liebig "is the true foundation of all trade and industry;" and Xenophon has observed that "agriculture is the nursing mother of all the arts; where it succeeds prosperously, there the arts thrive, but where the soil necessarily lies uncultivated, there the arts are extinct."

If there be anything in the relations which a profession bears to the external world, to establish its claims to dignity, then is the claim of agriculture thus established; for not only has the scene of its operations been laid by the Creator in the midst of His works, but over those works has He given it dominion. Finally, if to be distinguished by its moral tendencies entitle any calling to this distinction, then does it belong to that of the former; for, says Socrates, "Agriculture is the mistress and school of sobriety, temperance, justice, religion, and, in short, of all the virtues."

WEIGHT OF ANIMALS.—The gross weight alone is an imperfect test of condition—the heavier animals are not always the fattest, nor the smaller ones invariably in a lean state; the weight of a carcass of quarters of animals, in different degrees of condition, exhibit considerable variation in relation to their weight alive; the carcass of quarters of oxen, for instance, are found to bear the following proportions to the gross weight;—

	Per Cent.	Per Cents
A lean Ox,.....	46—the offal being	54
Half fat.....	54	46
Moderately fat.....	62	38
Extra fat.....	70	30

It is universally admitted that cattle ought not to be put to rich pastures or forcing food, in a lower state of condition, than that denominated half fat.

WHAT EDUCATION IS.—The multitude think, that to educate a child is to crowd into its mind a given amount of knowledge; to teach the mechanism of reading and writing; to load the memory with words; to prepare a boy for the routine of a trade. No wonder, then, they think almost every body fit to teach. The true end of education is to unfold and direct a right our whole nature. Its office is to call forth power of every kind; power of thought, affection, will, and outward action; power to observe, to reason, to judge, to contrive; power to adopt good ends firmly and to pursue them efficiently; power to govern ourselves and to influence others; power to gain and to spread happiness. Reading is but an instrument: education is to teach its best use. The intellect was created not to receive passively a few words, dates and facts, but to be active for the acquisition of truth. Accordingly, education should labour to inspire a profound love of truth, and to teach the processes of investigation. A sound logic, by which we mean the science of art, which instructs us in the laws of reasoning and evidence, in the true methods of inquiry, and in the sources of false judgment, is an essential part of a good education.—*Channing.*

THE SECRET OF WARM FEET.—Many of the colds which people are said to catch commence at the feet. To keep those extremities constantly warm, therefore, is to effect an insurance against the almost interminable list of disorders which spring out of a "slight cold." Firstly, never be tightly shod. Boots or shoes, when they fit closely, press against the sole of the foot, and prevent the free circulation of the blood. When, on the contrary, they do not embrace the foot too tightly, the blood gets fair play, and the spaces left between the leather and the stockings are filled with a comfortable supply of warm air. The second rule is—Never sit in damp shoes. It is often imagined that unless they be positively wet, it is not necessary to change them while they are at rest. This is a fallacy; for when the least dampness is absorbed into the sole, in its evaporation it abstracts the heat from the foot, and thus perspiration is dangerously checked. Any person may prove this by trying the experiment of neglecting the rule; and his feet will feel cold and damp after a few minutes; although on taking off the shoe and examining it, it will appear to be quite dry.

TRANSFORMATION OF THE LOCUST.—In the summer evenings it is common to see upon the trunks of trees, reeds, or any upright object, a heavy-looking, hump-backed brown beetle, an inch and a half long, with a scaly coat, clawed lobsterlike legs, and a somewhat dirty aspect; which latter is easily accounted for by the little hole visible in the turf at the foot of the tree, whence he has lately crept. I have sometimes carried them home, and watched with great interest the poor locust "shuffle off his mortal," or rather

earthly "coil," and emerge into a new world. The first symptom is the opening of a small slit which appears in the back of his coat, between the shoulders, through which as it slowly gapes wider a pale silky-looking texture is seen, throbbing and heaving backwards and forwards. Presently a fine square head, with two light red eyes, has descended itself, and in the process of time (for the transformation goes on almost imperceptibly) this is followed by the liberation of a portly body and a conclusion; after which the brown legs are pulled off like boots, and a pale cream-coloured, weak, soft creature very tenderly walks away from its former self, which remains standing entire, like a coat of mail of a warrior of old—the shelly plates of the eyes that are gone looking after their lost contents with a sad look of "speculation" in them. On the back of the new born creature lie two small bits of membrane doubled and crumpled up in a thousand puckers, like a Limerick glove in a walnut-shell; these now begin to unfold themselves, and gradually spread smoothly out in two large opal-coloured wings, which by the following morning have become clearly transparent, while the body has acquired its proper hard consistency and dark colour: and when placed on a tree, the happy thing soon begins its whirring creaking chirruping song, which continues with little intermission as long as its harmless happy life.—*Meredith.*

EXTRAORDINARY OPERATION UPON A COW.—A very singular operation, which may be denominated a purely surgical one, was performed upon a cow belonging to Mr. Edward Tyler, of Nerquis, near Mold, some two or three weeks back. The cow had an obstruction of the wind-pipe; and so effectual was the impediment to her breathing, it was supposed that in an hour or two, or less, it would have terminated her existence by suffocation. Mr. Chamberlain Tyler, a respectable farmer residing in the neighbourhood, was immediately sent for, and attended without loss of time. He made an incision between the fifth and sixth ring, about two inches long, and instantaneously the cow was relieved from her pain. The wound was left open from Monday to Wednesday, during which time the animal gradually improved; the wound was sewed up carefully by the operator, and since then, with care and attention, Mr. Tyler, the owner, is satisfied that in a very short time she will be perfectly well again.—*Liverpool Mail.*

WHEAT ENEMIES IN THE FAR WEST.—According to the Prairie Farmer they are not except in that section from enemies to the wheat crop any more than we are up East. Besides the Hessian fly, which sometimes makes sad havoc with their crops, they have a *chop* called the chinch bug, which burrows at the roots of the wheat, and destroys the crop. A writer in that paper gives a description of it, and the Editor obtained an engraving of it. It is represented as a small bug, with silver colored wings with brown spots; and the same writer stated that he had to quit harvesting his corn on account of the multitude of them on the stalks, which emitted an odour like the double distilled essence of hed bugs. Another scourge is described as a small miller, which creeps into the wheat bin and spins a web around some twenty or thirty kernels, where he and his progeny live fat upon the flour they find. This is probably a species of genuine weevil. It is very different from the weevil which destroys our wheat. Ours takes the wheat before it is filled, theirs after it is put into the bin. They are both small in their size, but mighty in mischief.—*Maine Farmer.*

The capital of Great Britain has a population estimated at 2,000,000 of souls exclusive of strangers. The population of Paris now exceeds 900,000; the population of Vienna is 330,000 souls; Berlin, 336,000; and St. Petersburg, 476,000.

The universal custom of mourning was white over the whole world, until about the year 1430.

Glass may be beautifully frosted with Epsom salts, dissolved in hot water, and applied with a brush while hot.

In any adversity that happens to us in this world, we ought to consider that misery and affliction are not less natural than snow and hail, storm and tempest; and that it were as reasonable to hope for a year without winter, as for a life without trouble.

THE BEAUTY OF WINTER.

(For the Mark Lane Express.)

They speak of summer's brilliant day, and warm, unclouded night.
They speak of summer's glowing sky so deeply blue and bright,
They speak of summer's woodland walks so wild and green and sweet.
With arching trees above our heads, and flowers beneath our feet;
Yet Winter, too, has beauty, joy, and comfort in its path,
In its calm and quiet evenings, and its bright and cheerful heart;
When shutters have been closed at night, and friends draw round the blaze,
To ponder o'er the latest news, or speak of other days,
There's beauty even in hours like this, so still, and grey, and cold;
There's music, even *music*, in the sheep-bell from the fold,
In the light and careless whistle of the shepherd's hardy boy,
For something even in these rude sounds, to my heart breathes of joy.
There's beauty in its midnight scenes so beautifully clear,
Though forest wastes are leafless now, and fields look bare and drear,
There's beauty when the cold bright moon is gleaming on the snow,
Lighting the starry sky above—the silent wood below.
'Tis joy, too, when the chilly winds are whistling o'er the earth,
To hear *within* the cheerful song, the laugh of glee and mirth;
To watch the shepherd's lantern, or the cottager's lone light,
Like some lost, wandering planet, gleaming out upon the night.
And joy in bright and frosty days to hear the singing snow,
The laugh of merry children, as the snowballs fly about;
To watch the shipping-hut of ice their hands have just begun,
Or the misshapen snow-man, as he glitters in the sun.
Thou canst not boast of summer's skies, or summer's fragrant flowers:
Yet Winter, thou hast crystal halls, and palaces and bowers.
Thou hast no green and quivering leaves to shade the beach's bough;
But still, thy heavy mass of snow has much of beauty now.

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