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THE

NOVA SCOTIAN

JOURNAL OF AGRICULTURE

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Omnium rerum, ex quibus aliquid adquiritur, nihil est agricultur melius, nihil uberius, nihil homine libero dignius.—Cicero: de Officiis, lib. I, cap. 42.

VOL. III. *HALIFAX, N. S., OCTOBER, 1877.* *No. 8.*

KENTVILLE, *Oct. 3rd, 1877.*

WE are now in the midst of the most successful and abundant Exhibition of the products of the soil and of native herds and flocks that has ever been presented in Nova Scotia. We have been accustomed, in King's County, to admire the magnificent stretches of marshland, unequalled in richness, recovered from the sea by a people who left them all an unwilling legacy to English colonists; we have, many a time and oft, dwelt with lingering delight upon shadowy glimpses of the pastoral life of the Acadians, with the gentle Evangeline as the central figure, and her poet-patron at once our instructor in history and the guide of our fancy. To-day, the farmer of King's can turn his back upon the past, and say, with honest pride: See what we have ourselves done; this Exhibition, these fruits of the soil, these herds of cattle, are no mere inheritance of richness, no mere borrowed plume from a poet's wing. They are all, in every sense, our own. We have cultivated the rich inheritance with a vigour that became fortunate inheritors sensible of the duty that their good fortune laid upon them, and now we present the result of our labours.

The Exhibition was formally opened on 2nd October. An Address was delivered by His Honor the Lieut.-Governor, which was listened to with attention throughout the whole building, and struck many a chord of sympathy in the heart of every Nova Scotian. His Honor was followed by Colonel Laurie, who presented the Agricultural problem of the Province in so clear and logical a manner as to render it plain to every one. His Honor Sir William Young concluded by an eloquent appeal to the farmers, in the chaste style and glowing language which are so peculiarly his own,—after which William Eaton, Esq., the Chairman of the Committee, conducted the distinguished visitors over the Exhibition.

In the evening, a discussion took place in the Court House, on Grain Growing, in which the leading farmers of the district, as well as strangers from a distance, took part. Both on Tuesday and Wednesday the attendance at the Exhibition grounds was very large. The influx of visitors has been beyond the capacity of Kentville to accommodate with comfort. It is obvious that the place is too small to have both the Exhibition and the Trotting Park running at the same time. It is hoped, that on future occasions, a mutual arrangement may be made, whereby the interests of the public and of Kentville may be subserved by running the two on separate tracks.

THE Colchester County Agricultural Exhibition, open to the whole Provincel was held at Wimburn Hill, Truro, in the last week of September, and proved a great success. Tuesday, 25th, was the day of preparation, the Exhibition was formally opened on Wednesday, 26th, at 2 P. M., by an eloquent address from His Honor the Lieut.-Governor. Two thousand persons visited the Cattle Sheds and the Palace of Industry on that occasion, and on the following day the grounds and buildings were likewise crowded by an orderly assemblage of as intelligent, healthy, and comfortable-looking farmers, and their wives, sons, and daughters as may be found in any country in the world. On Thursday, 27th, the proceedings were brought to a close by an able address by Israel Longworth, Esq., the Representative of the District [No. 4] at the Central Board of Agriculture. In connection with the Exhibition, the Committee invited the farmers to a free meeting in Association Hall for the discussion of agricultural subjects. The attendance was not very large, but the Committee should not be discouraged, as it was about three times as numerous as that of a similar meeting which we attended some years ago in connection with the Annual Exhibition of the New York State Agricultural Society.

The Exhibits were highly creditable to Colchester and other competing Counties in every department except one. The horses were said by some horse men to be very good, but horses are so much on the move that it is difficult to find them, and the horned cattle were certainly of a very high character indeed. Mr. Fraser's excellent Short-Horn Herd, in the highest possible condition, the Royal-blooded and red-coated Devons from Oakfield, the big mountains of beef from Fort Lawrence, and the Ayrshire beauties, so gentle in their milky ways, from Hillside farm, were of themselves sufficient to form a substantial cattle exhibition. But there were many other fine animals, Jerseys and Grades

of various kinds, besides very fair sheep and remarkably good pigs. Mr. Downes' pigeons attracted much attention, also the Pekin ducks and other superior fowls. The roots and vegetables were very good, but not so abundant as at the Provincial Exhibition last year. The fruit collections from New Annan showed that King's and Annapolis Counties are fast losing their pomological monopoly. Manufactures were not shown to an extent commensurate with the reputation which Truro had gained during the last few years as a rising centre of mechanical industry. Several manufacturers, however, did their best to maintain its position. Mr. Killer, Truro, gained first prizes for boots and shoes over both Halifax and other Truro factories, whilst the leather prizes were taken by Mr. Archibald of Truro, and Mr. Fraser of Shubenacadie. Shubenacadie bricks were to the fore. Mr. Craig, Truro, was strong in agricultural implements, Linton & Black in carriages, Smith in stoves, Goss in buckets, Jameson in tinware, and Snook & Lawrence in harness.

I PURCHASED two dozen roses, of the hybrid perpetual persuasion, in the month of May. I was told they were good strong plants—a year or two year old stocks, or some such technical term, was applied to them. I was told to dig deep and put in plenty of manure, with rich mould on top, if I could get it, and then, as the roses were budded upon wild roots, to plant them slanting, so that the bud shoots might send out fresh radicles. All this was done most carefully for me by an experienced gardener, except the slanting, which I forgot to tell him of, and which he probably considered unnecessary. Out of the twenty-four roses planted in May, twenty-one are now (August) healthy, leafy, and, most of them, blooming bushes; one is entirely dead, another has its only sign of life in shoots from the root with seven leaflets, showing apparently that they come from the wild stock, and a third has a few weak shoots that may or may not be genuine. I am pleased with the result. Shall I describe the blooms of the different varieties?

The first to bloom was *Abbe Brameral*, a very flat rose, shape of one of Moir's wine crackers, with numerous crowded petals, closely packed in the rag-mat style, so as to present a flat uneven surface. The petals are velvety, and of a very rich and very dark claret colour, changing in shade from day to day. I will always try to recollect the good Abbe's rose by its claret colour and cracker shape.

Antoine Ducher came next into bloom. I learnt from the Rose Supplement of the *Gardener's Chronicle*, that M. Ducher was one of the distinguished rose growers of France, and, as this rose bore his own name—he had as it were staked his rose-reputation upon it—I expected great things. Nor was I disappointed. It made a fine cluster of uniform blooms, slightly flattened balls of most perfect form, consisting of purplish rose, imbricated, conchoidal petals, very regular in shape, and closely fitting each other. From first to last it is a beautiful rose.

Victor Verdier is perhaps better known than any of the others, being a standard sort that never fails to give satisfaction. Although my young plants of other varieties have given half a dozen blooms each, more or less, my Victor Verdier has given only one as yet, but that measured fully four inches across, and was truly magnificent. The petals are large, of the crimson purple characteristic of hybrid perpetuals, and the foliage is fine, of the flat leathery style which distinguishes high bred roses of this class. Since blooming it has made strong shoots.

Baroness Rothschild is a good match for Victor Verdier. Her bloom is quite as large, and nearly the same shape and style; but the colour is quite a contrast, a pale bright pink; the surface texture of the petals is waxy and as delicate as that of the finest tea rose. The Baroness is in every way as good as the Victor on a near view, but far more effective at a distance, owing to her light, bright, blooming, blushing colour. Although the petals are so delicate they stand a bright summer sun better than the dark velvety roses. After nearly a whole week's exposure to the sun this delicate looking rose is as bright and as fresh as when it first opened.

Comtesse de Jaucourt is a bright rosy-pink rose, of inferior size, but the individual petals are rather large, conchoidal, and do not decrease much in size towards the centre.

Baronne Prevost, flat, crowded petals, rosy or bright pink colour, a hard hearted sort, but a fine showy rose.

Leopold the 1st, considerably darker and richer in colour, and of a more decided hollyhock or pæony shape, the guard petals being erect, not curved back as in Prevost. This is the brighest crimson of any rose I have seen this season. (Later blooms were not so bright.)

Anna Alexieff is of a most delicate blush, almost white; shaded with the fairest skin colour. As it opens it forms a pretty ball, rather under size. But Anna's complexion is so very delicate that, as they fully expand, the petals rapidly show a few traces of brown freckles, and the whole flower acquires, besides, a rather tawdry appearance. When the blush tinge disappears, it is seen that the petals are not really white; —they have an unbleached appearance. The proper term, when applied to the complexion, is, we believe, "washed out."

Cardinal Patrizzei is a simple little globular button rose, like the conventional rose-bud knobs that one sees on old oak carvings in ecclesiastical edifices, and, although neat in form, and rich and of medium depth in colour, seems to have nothing more to recommend it than its suitability as a button-hole rose for gentlemen who prefer a quiet decoration.

Cheshunt Hybrid, is the strongest-growing of all our roses; it has the growthy succulent wood, and slightly shiny and leathery foliage of a china tea rose. The flower opens out into a flat mat of very rich crumpled petals of the Berlin-wool sort, of a rich deep mottled rose colour. The stalk is weak and the flowers heavy and completely drooping when at its full. This rose would make an admirable pattern for a pen-wiper to be sold at a Church bazaar at a fabulous price. The young shoots and young foliage are of a rusty purplish-red colour, becoming green and glossy as they mature.

Auguste Mie is a most brilliant rose, of a very rich colour that can only be described as deep carmine. The petals are very large and not numerous; the bud opens out into a nest with a large egg-like ball in the centre of unfolded petals, which, however, soon spread open like the others; even the centre petals are finally large, and all have revolute margins. To a neighbour, who is quite an experienced, and withal a learned, Rosarian, I pointed out these beauties of Auguste Mie, to which he replied, to my chagrin: "Isn't Auguste Mie a white rose? It may be so. It may be that somebody has blundered; but even under any other name my rose will smell as sweet and bloom as bright: as for its name, ah! me."

Before concluding, it may be well to refer to another disappointment—just one like the last mentioned; such tend to increase ones zest in floriculture, to check ones exhuberance of enthusiasm, to beget a due modicum of modesty, and, above all, to increase the knowledge of the inexperienced.—As the summer passed on I noticed that some of my roses did not bloom, but made good strong growths of long weakish shoots, with leaves marked rather by multiplicity than size of leaflets. This led me to the discovery that some of my roses were merely wild stocks.

As a rule the leaves of Hybrid Perpetual roses consist of five leaflets, but the wild rose stock upon which they are usually budded has leaves of seven leaflets. A knowledge of this circumstance enables the experienced grower to pull out any shoots that the wild stock may send up. It appears, however, that some of the Hybrid Perpetuals have seven leaf-

lets, as exemplified by Victor Verdier and Baron Lassus de St. Genis; the leathery texture of Verdier and the Baron's leaves enable them to be distinguished from those of the wild stock, which are thin and shiny, like our common wild rose, *Rosa blanda.*

Another new plant has to be added to the list of the Nova Scotian flora. We have received from Professor Macdonald of Dalhousie College a specimen of *Digitalis purpurea,* picked up by Mr. Poole on a kind of barren cleared two seasons ago, and in which the only seed he knows to have been sown, and that last year, is turnip seed. This plant is the fox glove of Britain, the Digitalis of the Materia Medica, and is commonly known in some parts of Scotland as Deil's Nightcaps. The botanical name Digitalis, as well as the English, and also the German one, Fingerhut or Fingerhut blumen, refers to the resemblance of the flowers to the fingers of a glove. This plant is the Ephemeron of Dioscorides; its connection with the English fox and the Scotch deil remains unexplained. It is not native anywhere on the American continent, and must be regarded as simply a colonist in Nova Scotia, some foxglove seed having probably become mixed accidentally in the seed store with the turnip seed referred to.

We have to thank Professor How, D. C. L., of King's College, for his pamphlet on "Pyrrhotites," which word, we may explain, is meant "for short," and scientific for magnetic iron pyrites. He finds in a Cape Breton specimen one half of one per cent of nickel and cobalt; in a Nictaux specimen a tenth of a per cent, chiefly of nickel; three samples from Latete, N. B., yielded respectively nearly a tenth of one per cent, nearly four tenths, eight tenths, and four tenths. Specimens from Lowell, Mass., reported to contain 25 or 30 per cent. of nickel, yielded on analysis, nearly 2½ per cent. Mispickel from Montague, Halifax County, yielded nearly a tenth of one per cent cobalt metal and a little manganese; that from Lunenburg gave reactions for both nickel and cobalt. Dr. How finds distinct evidence of these two metals in the slate rock matrix of them inerel Pickeringite at Newport, N. S., independent, apparently, of any metallic sulphides. Millerite from Tilt Cove, Newfoundland, of a pure yellow colour, in six-sided crystals and plates, gave the blow-pipe reactions for sulphur and nickel only. The nickel ore at Tilt Cove is chiefly another mineral, kupfernickel, occurring in pockets in the copper pyrites so largely raised the last few years. Dr. How's pamphlet concludes with a postscript which is mildly acetose, where some writers would certainly have made it powerfully dynamitish because of Professor Reynolds' adopting Rammelsberg's erroneous formula for Ulexite in preference to How's, because of How's formula being again and again perversely attributed to Kraut, and called Kraut's, and because Prof. R., by taking the wrong formula for comparison with his new mineral, Franklandite, makes it appear that the substitution of one molecule of sodic oxide for three of water is capable of converting How's Ulexite into Reynolds's Franklandite, as far as comparison is concerned, whereas the latter differs from the former by containing one molecule of sodium metaborate in addition. Why How's mineral is called Ulexite we cannot well tell our readers, unless it be in allusion to the prickly Ulex or furze, on account of the many fine points and sharp discussions which the mineral has raised.

It appears that the sending away of so much first class beef to England, has had a marked influence on the American and Western Canadian markets, where good beef is now becoming scarce. There is plenty of scrub beef, but consumers don't want it. The reason why Canadian beef has hitherto found such a ready market in Halifax and is preferred by patriotic citizens to the home manufacture is that we have still so many old fogey farmers who don't know that there is a difference in texture between beef and shoe strings. There is no country in the world with greater capabilities for beef production in proportion to its size than Nova Scotia, and the introduction of a hundred and sixty thorough-bred bulls is working a rapid change. But our farmers are still unable to take from the public the money they are willing to give because they don't raise enough to sell. In the towns and villages we hear everywhere that money is scarce. A more abundant production on the farm would soon bring plenty of money.

We are indebted to Robert Morrow Esq., for the following memorandum:—

The following is the passage from Prof. Macoun's report contained in the "Report of Progress, 1875 and 1876, Geological Survey of Canada," page 111:—

"Another small shrub (Pachystigma myrsinites), deserves mention on account of its adaptability to our climate. I found it in flower in November, 1872, when the thermometer was below zero, as far north as McLeod's Lake, latitude 55°, and again in May on Vancouver's Island. It is an evergreen, and the flowers of the preceeding autumn remain on all winter and produce fruit the following summer."

I hope you will find something of interest to you in the above extract.

In a recent shipment of 215 Canadian Cattle to Liverpool there were some magnificent specimens of oxen, two of which are figured in the *Agricultural Gazette,* (London). Mr. Sheldon, who went to Liverpool to see them, speakes of five as showing a combination of size and quality "seldom seen in England or any other country;" at all events he never saw five animals together before which possessed this combination in such a striking degree. One ox was a rich red roan, having evidently a great deal of Short Horn blood, he measured: from roots of horns to root of tail, 8 ft. 9 inches; girth behind the shoulder 9 ft. 4 inches; height to tip of shoulder, 5 ft. 8 inches; gross weight, 3600 lbs.; Dead weight of saleable meat, calculated at 57 p. c., 2052 lbs. He was 6 years old, bred by Mr. Snell.

Both at Middle and Upper Stewiacke on the 20th, Professor Lawson referred in his lectures to the marked beauty and fertility of the *Stewiacke Intervale,* which he had seen for the first time in that morning's sun; to its broad expanse of rich grass land, as flat and smooth and green as the fields of Holland, stretching away for twenty-five or thirty miles and sarcely anywhere less than two miles in breadth, the large square fields, here outlined by giant elms, and there adorned by scattered trees, all stately and graceful, and on either side of this immense carpet of broad and verdent acres, we have a sheltering range of beautiful rounded hills, rich in undeveloped wealth that lies at the surface as a fertile soil, underlaid by plaster and lime, to supply the means of making it still more fertile, and these gently undulating hills are inviting the plough up and over the grassy slopes, for which the healthy white flocks are now preparing the way. The whole scene, he said, presented a picture of pastoral beauty, which reminded him more than anything else he had seen on this continent of some of the richest agricultural districts of England. We want only a steam plough and a dotting of thorough bred short horn Durhams and Devons and Ayrshires, over the meadows to make Stewiacke look very much like the Rothschild farms and other rich tracts in Buckinghamshire, where the fields feed twenty thousand cows, besides all other kinds of cattle, and annually send two thousand tons or more of beautiful butter into the London market, realizing, in the poorest year, from this product alone, a million and a half of dollars. To render the fields of Colchester as productive as those of Buckinghamsnire is a very simple problem to the scientific agriculturist. Three things are required—systematic culture; selection of suitable thorough-bred stock; economical, that is intelligent, feeding. But why the people of such a country should

dream of wandering West through some Manitoban wilderness to hew out new farms for themselves that cannot possibly, in their lifetime at least, be as good as the old—this is a problem that he did not attempt to explain on any scientific or other principle. Horace Greeley used to say to the young men "Go West." Our formula should be "Go to Stewiacke."—*Chronicle.*

The *London Globe* furnishes the following account of the latest sale of Canadian Short Horn Durham Cattle in England :—

It was quite anticipated that Mr. Cochrane's consignment of short horns from Canada would be one of the sensational sales of the year, but Mr. Thornton, who sold the cattle, could scarcely have expected that 4,300 guineas would be reached for one animal. The stock that was sold yesterday were shipped on the 4th of August from Montreal, and were landed in Liverpool on the 15th, and after a ten days' passage they looked uncommonly well, thus proving that their constitutions were hardy when they appeared on the slope of Cloudesdales Farm, at Eillesbeck. The animals sent over consisted of a number of first-class specimens of the Booth blood and of the Bates, the latter of which are decidedly most in favour at present. Of the Bates, the Third and Fifth Duchess of Hillhurst, were present; also the celebrated bull, Second Duke of Hillhurst, and son of Sixth Duke of Geneva, which is now in use in the heard of the Earl of Dunmore, whose selections from his herd made such high prices two or three years ago. [The spendid Bull Lord of Braemar, owned by the Bridgetown Agricultural Society, was bred by the Earl of Dunmore.] When Vesper Star came into the ring there was quite a sensation. She is a charming red and white cow. From 100 gnineas which was bidden she rapidly rose to 1,000 guineas, at which sum the sand-glass ran down, amid cheers, to Mr. Crosby, of Kerry, Ireland. When the Third Duchess of Hillhurst, a magnificent red, stepped into the ring there was not a moment's pause until 1,000 guineas were offered, and Mr. Loder claimed her as his own at 4,100 guineas, amid great applause, Mr. Thornton declaring her to be the highest priced cow in England. Lord Bective, when Fifth Duchess of Hillhurst came into the ring, offered 1,000 guineas, capped immediately by 1,000 more. Then 3,000 came, 3,500, and Lord Bective, being determined to have this beautiful red in defiance of all other competitors, even bid 1,000 guineas advance upon his previous bid, securing the charming creature for 4,300 guineas, which is, with the exception of the Duchess of Geneva, sold at New York Mills sale two or three years ago for 7,000 guineas, the highest price ever given. The Second Duke of Hillhurst, a magnificent specimen of the shorthorn breed, at 80 guineas, fell to Mr. Longman, of Paternoster-row. The sale resulted in the grand total of £17,150.

The commercial men of Toronto are deserving of much credit for their enterprise, even if they are preparing to take more golden apples out of the teeth of Montrealers and Halifaxians. Encouraged by the success of the spring sale of horses, when upwards of 600 were disposed of, we learn by the English Agricultural papers that the Toronto men have made arrangements for an autumn sale on Sept. 29th, 30th, and Oct. 1st, when 300 horses will be offered, specially selected for the English market; favourable rates of passage across the Atlantic have been arranged.

With reference to the notice of *Digitalis purpurea* in another column, we wish to add some information subsequently obtained from H. Poole, Esq., Inspector of Mines. It appears that the locality where the plant was found is about a mile and a half south of Riversdale, Pictou County, and that there was no crop in the land last year, when it was first cleared. We have consequently now no information indicating its probable origin.

A County Agricultural Exhibition was held at Pictou, unfortunately on the same days as the Truro one; farmers, not being birds, could not be in the two places at once. We learn, by the papers, that the Pictou Exhibition was very successful, that the stock, and especially the horses, far exceeded expectation, and that much interest in agricultural improvement was excited among the farmers and others who attended.

At the recent Exhibition at Antwerp, the wheat and other cereals were very small and stunted, and the straw much discoloured. The roots were all full of finger-and-toe, potatoes very poor and diseased. "Belgium is half a century behind England in agricultural plant and implement improvement,"—so says Mr. Howard. The only *novel* implement shown at Antwerp was a hand threshing machine. From the accounts received, we think Pictou or Truro or Kentville could each beat Antwerp. The great art of the Belgian farmer is the saving of manure.

Several pedigrees of registered stock are necessarily deferred till next No.

Let not Nova Scotia farmers imagine that we have a wet climate. Fifeshire is one of the best grain-growing counties in Scotland,—yet see the report of August, 1877 :—"There was only one day on which rain did not fall during the whole month; total rainfall for the month 10 inches. (!) There is still a great deal of hay to secure (Sept. 6), and at least a half of what is in the fields is rotten." Notwitstanding all this, Fifeshire farming is profitable, and farmers pay a rental of three or four pounds per acre.

At the Exhibition held at the Agricultural Hall, London, this week (Oct. 3—8th), prizes are offered for cheeses in bulk, not less than one ton, 1st, silver medal and $175; 2nd, bronze medal and $100; 3rd, $50; 4th, $30; 5th, $20. We do not hear of any Nova Scotian cheeses having been sent. The difficulty brought up at the Truro Root discussion might possibly be got over by offering prizes similar to the London cheese ones, for roots in quantities of not less than one ton.

We copy from the *Agricultural Gazette* the following very complete account of the terror to potato growers, from the pen of our excellent entomological friend, Andrew Murray, Esq., in former years lecturer on Natural Science in the new College of Edinburgh. The coloured drawings referred to may be seen at the Kentville Exhibition, and will afterwards be placed in the Chemistry class room in Dalhousie College at Halifax :—

[Anxious like our contemporaries to lend our aid towards making the dreaded Colorado potato beetle, with whose invasion we are threatened, as universally known as possible, so that everyone that meets it may at once recognise it and destroy it, we this week give a coloured plate—in which the larger figures have been drawn and coloured from nature by Mr. Andrew Murray, F.L.S.—exhibiting the beetle in its various stages, and also showing it considerably magnified so as display its characters with greater accuracy than can be done in a smaller figure. At the same time the following *résumé* from the pen of Mr. Murray, of its history, its habits, and the proper mode of dealing with it may prove useful to our readers.]

HISTORY.

Along the slopes of the prairies lying at the foot of the Rocky Mountains, grows a wild potato plant named Solanum rostratum. Its range extends up the ravines or canons of the Rocky Mountains, but the recorded habitats are chiefly on the prairies. It is a prickly plant, being provided with strong spines both

on the surface of the leaf, and the stem, and also on the calyx. As with most other prickly plants the spines are one of the means which nature uses for the distribution and spread of the plant, and there can be no reasonable doubt that the buffaloes, in their annual migrations southwards and northwards, have carried the seed vessels of this potato along with them, and extended its distribution as far as their own range. So long, however, as the dissemination of this plant was confined to the buffaloes, the spread would be confined very much to a northern and southern extension, for the migration of the buffaloes (at least since the time when they have become confined to the prairies west of the Mississippi and Missouri) have been practically north and south.

When, however, the progress of settlers in the west began to make itself felt in these wild regions, a new element was introduced. A traffic in cattle sprang up between the west and the east; the old pasture grounds of the buffalo were encroached upon by herds of the Spanish half-breeds of Texas, and a new direction given to the spread of the wild potato-plant. It then spread easterly.

This prickly potato plant is the food plant of the Colorado beetle, and the insect has accompanied it in its spread eastwards, so that at last, in 1850, it had reached a point within a hundred miles of the city of Omah, in the territory of Nebraska, and also, no doubt, reached many other outlying settlements under similar conditions, where it met the European potato cultivated by the settlers, and at once, contrary to the usual habit of insects, showed a preference for the cultivated exotic species over its native food plant. Attacking it voraciously, and increasing in numbers, it passed on eastwards, and in the short space of 15 years it has spread over the whole breadth of the United States, and after reaching the Atlantic shore, has even made a reconnaisance in Europe.

The above we believe to be the true history of the pest. It was at first said that the insect was a native of the Rocky Mountains, and that it had passed from them across the prairies by movement from potato patch to potato patch; but the idea is inadmissable, because even now (much less in the days before the Pacific Railway) there are no such potato patches to be found there, except c.. the eastern borders.

DESCRIPTION OF THE INSECT.

Little need be said on this score beyond referring the reader to the plate, which is the best description a non-entomological reader can have. The eggs are shining, translucent orange-red. The grub or larva in its first stage is Indian red, so intense as to be nearly black; it then becomes Indian red with a black head, and in its last stage it has become a lighter Indian red, with a double range of black spots along each side of its body towards the margin, and with a black head, the first segment of its body after the head also black, edged in front with yellow. The legs are black and the tarsi have three joints. The pupa is ochreous yellow, without markings. The perfect insect is ochreous yellow, with five black longitudinal stripes on each wing-case, bearing strong punctures along the sides of each stripe, and some spots which are variable in size and form, on the thorax and head. In the individuals that have been acclimatised in Canada and have passed over to Germany, the ground colour has become much paler, almost Naples yellow instead of reddish-yellow, except on the outer margin of the wing-case, which is still reddish yellow. The punctures along the black stripes are also less marked. There are also some black spots on the under side, and the knees and the tarsi are black. The antennæ have the first five joints yellow and the remainder black, and the wings are rosy red. In flight the head is depressed in front and the body behind, so that, looked at from in front, none of the after part is visible.

HABITS.

About the end of May the first eggs of the year are laid. They are placed on the under side of the leaves, and are hatched in about a week after being laid. The larva feeds upon the leaves, and undergoes at least three changes of skin. The period which it passss in the grub state is variable, a good deal depending on the weather, sometimes becoming full-fed in about ten days, but more usually requiring a fortnight, and in some cases three weeks. Seventeen days is said to be a normal average, at least in the northern parts of its range. As soon as it is full-fed it descends and buries itself in the earth, where in three or four days it passes into the pupa state, and after remaining in that state for about ten days longer the perfect insect comes out. In about a week the female begins laying a fresh brood, and continues laying at intervals for some time. The same course is repeated with the new brood, and so it goes on until the beginning of October, when the perfect beetles remaining at that date descend into the ground to pass the winter in a state of torpidity. They descend to a considerable depth—Mr. Riley speaks of feet.

The larva is a most voracious feeder, and has been estimated to increase in weight 200 times between the date of hatching and that of obtaining full maturity. It is melancholy to look at the potato crops when undergoing an attack of this insect—the head hangs down, the stems are flaccid and feeble, the leaves withering, and the whole looks as if struck by some blight.

But besides feeding freely on the cultivated potato, it also seems to be as injurious to the tomato. In Canada we have seen as many on it as on the potato. We have, however, heard within the last few days a very remarkable fact from Canada (London, in Ontario), that although in this present year, 1877, it seems as abundant as ever it was in the last three or four years, it is not doing the same amount of mischief to the potato. Entomologists have not yet said to what this is due, but it may be that it is extending its favours to other plants as well as the potato.

The above statement of the habits of this insect gives sufficient information as to the only period of the year when its arrival in this country need be looked for. From the beginning of October to the end of May it is sound asleep at some depth under ground, consequently it need not be looked for at that time. It is barely possible that some of the newly awakened beetles in the end of May or early June might by chance get shipped over to this country, but this is barely possible. The insects are then, we may presume, intent either on restoring their strength after their long winter's fast by making a copious breakfast, or upon their function of propagating their species so that until after the first brood has been reared they need not be expected. The first brood will be reared by the beginning or middle of July, and from that date until the end of October they go on increasing, both in numbers and, apparently, in vitality, if we may judge from their comparative restlessness and greater disposition to fly about. At first they were very sluggish in their movements. There is nothing to hinder their coming at any time between these dates.

REMEDIES.

Remedies divide themselves into two kinds, direct and indirect.

The indirect consist in the encouragement of the natural enemies of insects generally, and those of this special pest in particular.

Long lists of the insects that have been found preying upon it in America have been given in various of the scientific periodicals of that country. But as Mr. Le Baron, the state entomologist of Illinois, has justly pointed out, there is no one of these many enemies, with the exception perhaps of a minute parasitic ichneumon fly, that is exclusively appropriated to it. They all prey upon the Colorado beetle, when it comes in their way, as they prey on any other species,

but do not depend upon it for their subsistence. Besides, predacious insects do not belong to the prolific class. It is only the harmless tribes that have social instincts and congregate in herds. Fancy lions in flocks and antelopes in families, or sheep in pairs. The battle for life would soon put that right were it needed, but it is not. The predacious insects are too few in number to make much head way against such a multitudinous host as the Colorado potato beetles. Mr. Le Baron says that he has repeatedly walked through potato fields, with the express intention of taking note of their destroyers, without seeing any creature seriously deserving of the name. Nature, if left to her own resources, often exhibits wonderful curative and recuperative powers, which are ordinarily sufficient to preserve the world of insects and that of plants. If in any case like the present she seems to fail, it is because we have abruptly distributed the ballance by supplying these prolific insects with a superabundance of congenial food, and now that we are overrun by them we stand aghast at the consequences. But nature often accommodates her economy to human wants, and rectifies our errors; and we cannot doubt that the Colorado beetle, like other noxious insects that have been equally prevalent, will in time be reduced to reasonable numbers, if they do not wholly disappear even in those districts where it is now most abundant. A single year's destructive potato disease, such as that in 1846, would be sufficient to clear it away. The remedy is a sharp one—too sharp for voluntary imitation. Therefore let us rather see what can be done by direct remedies.

These are either simple hand-picking or sweeping together the masses of the foe when they are in such numbers as to allow them to be so dealt with. That they are often in such numbers we can vouch from personal observation in America. We have seen the potato plants loaded with them in such numbers that a rough shake would send down scores to the ground, and in some of the towns the beetles literally swarmed in such numbers that thousands were daily trodden down on the side walks and streets. Moreover, although the beetle is furnished with large wings, it is not always that it makes use of them. When we have knocked them off the plants they made no effort to fly. This, of course is a great help in hand-picking them, or collecting them by other means. Hand-picking has generally been the first and the principal means adopted to control them, especially in outlying districts, and where persistently followed it has generally proved sufficient to protect the small patches of potatos in cottage gardens and such places, but it requires to be constantly repeated and is of course exceedingly troublesome, and it becomes perfectly impracticable where large crops have to be dealt with. The usual method of collecting them on this small scale is to knock the insect off the plant with a stick into a small basin or pail containing a little water placed to receive them, and as both insect and larvæ drop off readily on the plant being struck great numbers are thus easily collected. These have then to be destroyed, which is usually done by throwing them into a hole in the ground and pouring boiling water over them. When large fields are to be treated other means must be had recourse to. For them an ingenious machine has been devised by the Americans as a substitute for hand-picking. A thing like a scoop is driven up the drills with an apparatus on each side for knocking the insects into the scoop. All such means of dealing with them, however, are clumsy and inefficient in the view of the great fertility and productiveness of the insects. Hundreds may be destroyed, but tens will remain, and these tens will in six weeks' time make matters as bad as they were before. Some more effective remedy was felt to be necessary, and it was found in the arsenical poison known as Scheele's green, and of which the emerald green of our paint boxes is an improved form, and is the pigment that has often produced deleterious effects in houses whose walls have been covered by bright green papers. It is called Paris green in America. In buying it in this country we had better ask for emerald green. It is an arseniate of copper, and, like all compounds of arsenic, is a deadly poison. The external application of this green has been found to be fatal to the Colorado beetle, especially to the grub, on whose soft and fleshy skin the powder more readily acts. It can be applied either in powder or mixed with water. When so mixed it cannot be called a solution, because it does not dissolve; but being constantly shaken up it remains sufficiently in mechanical combination with the water to allow it to be used as a solution. It is to be observed, however, that whether in powder or liquid, it must be used sparingly, for if used pure and too abundantly it will kill the foliage of the potato as effectually as the bugs would, and much more quickly but when used in powder if mixed with 6 to 12 parts of flour ashes, plaster, or slack lime, it causes no serious injury to the foliage and kills the bugs perfectly well. When applied in liquid it ought to be mixed in the proportion of three tablespoonfuls to 8 galls. of water. An ingenious contrivance has been adopted in America for sprinkling the potatoes with the mixture. It consists of a tin can to hold the liquid, made so as to strap on the back of a man. To the bottom of it are affixed two short gutta percha tubes fastened to holes in the bottom, and fitted at the other end with a rose, the bearer walks up and down between the drills with a rose in each hand, sprinkling the potatoes as he goes along. There is an apparatus inside the can for keeping the mixture stirred, and a lever for shutting off the outflow. It is said that from 5 to 8 acres a day can readily be sprinkled by one man using the can, and from 1 to 3 lb. of emerald green, according to the size of the plants, will be sufficient for each acre.

These are plans for dealing with the insect when it has established itself. Something more stringent must be had recourse to in attempting to stamp it out on its first appearance. The course adopted at Mullheim, near Cologne, on the occasion of its recent introduction there, seems to have been judicious. The vines of the potato field were cut down, and the whole field, vines and all, burnt with a mixture of petroleum and sawdust. Thereafter the field was sprinkled with emerald green.

One would have thought that such heroic treatment would have been successful; but it is a startling evidence of the difficulty of dealing with this insect, that it has not been so. Two subsequent outbreaks in the immediate vicinity of the first have since occurred, and there can be no reasonable doubt that they were either successive or continuous broods of the original importation. By continuous we mean the brood resulting from the protracted oviposition of the mother.

It is difficult to stamp out the insect, even where we can place our hand upon it in all its stages in a potato field, it is still more so to prevent its isolated entrance from abroad. We see that living individuals have reached Liverpool in the fodder of a cattle ship. We fear that it would be easier to find a needle in a bundle of hay than to shut all the doors of access to this most persistent intruder. —A. M.

Speaking of the improbability of the Colorado beetle reaching this country, a correspondent recently put this question, "How could it survive a sea voyage without its natural food?" Replying to this question, Mr. J. B. Doyle writes to the *Times* from Bessbrook, Newry, as follows:—In compliance with my request, a gentleman residing in the Sate of New York sent me, by my son-in-law, who was over at the American Exhibition, eight full-grown specimens which he enclosed alive in a little tin box about the size of a five-shilling piece, in which a single hole was punched. My relative had them in his possession for six weeks before I received them. He generally carried them about in his breast coat-

pocket. When I opened the box they were not only alive, but were so active that I found some difficulty in collecting them to put them into the box again, which I did very carefully, and not without some anxiety lest one should escape. I may add that no kind of food whatever was put into the box, such is the amazing vitality of this insect; so that upon that score we are deprived of the consolation which Mr. McDonald's query would inspire. I lost no time in plunging the living specimens into a bottle of spirits of wine, from which they were removed to my cabinet after 24 hours' immersion."

A REUTER'S telegram from Dresden, dated August 9, says:—The *Official Journal* of to-day announces that the Colorado beetle has appeared in a potato field near Schildau, in the district of Torgau, not far from the frontier of Saxony, the fact having being verified yesterday by an official investigation. The journal adds that all precautionary measures were immediately taken by the authorities.

DESTRUCTIVE INSECTS' BILL.

THE following Bill for preventing the introduction and spreading of insects destructive to crops, has passed the House of Lords, and is now in the House of Commons:

GREAT BRITAIN.

1. The Lords and others of Her Majesty's Most Honourable Privy Council (in this Act referred to as the Privy Council) may from time to time make such Orders as they may think expedient for preventing the introduction into Great Britain of the insect designated as Doryphora decemlineata, and commonly called the Colorado beetle.

Any such Order, if the Privy Council think fit, may prohibit or regulate the landing in Great Britain of potatoes, or of the stalks and leaves of potatoes, or other vegetable substance, or other article brought from any place out of Great Britain, the landing whereof may appear to the Privy Council likely to introduce the said insect into Great Britain, and may direct or authorise the destruction of any such article, if landed.

If any person lands or attempts to land any article in contravention of any Order under this Act, such article shall be liable to be forfeited in like manner as goods the importation whereof is prohibited by the Acts relating to the customs are liable to be forfeited; and the person so offending, shall be liable, according to those acts, to such penalties as are imposed on persons importing or attempting to import goods the importation whereof is prohibited by those Acts.

2. The Privy Council may from time time make such orders as they think expedient for preventing the spreading in Great Britain of the said insect.

Any such order may, if the Privy Council think fit, direct or authorise the removal or destruction of any crop of potatoes or other crop or substance on which the said insect in any stage of existence, is found, or to or by means of which the said insect may appear to the Privy Council likely to spread, and the entering on any lands for the purpose of such removal or destruction, or for the purpose of any examination or inquiry authorised by the order, or for any other purpose of the Order.

Any such Order may, if the Privy Council think fit, prohibit the selling, or exposing or offering for sale, of living specimens of the said insect, in any stage of existence, or the distribution in any other manner of such specimens.

Any such Order may impose penalties for offences against the Order, not exceeding £10 for any offence; and those penalties shall by virtue of this Act be recoverable, with costs on summary conviction before two justices of the peace, and shall be applied as penalties recovered under the Contagious Diseases [Animals] Act, 1869, are applicable.

3. Where by any Order under this Act, the Privy Council direct or authorise the removal or destruction of any crop they may direct or authorise the payment by the Local Authority of compensation for the crop; and the Local Authority shall pay the same, subject and according to the following provisions:

(1). In the case of a crop on which the said insect, in any stage of existence, is found, the compensation shall not exceed one-half of the value of the crop.

(2). In every other case the compensation shall not exceed three-fourths of the value of the crop.

(3). The value of the crop shall in each case be taken to be the value which, in ordinary circumstances, the crop would have had at the time of its removal or destruction.

(4). The Local Authority may, if they think fit, require the value of the crop to be ascertained by their officers or by arbitration.

(5). The Local Authority may, if they think fit, withhold compensation if, in relation to the crop, the owner or the person having charge thereof, has, in their judgment, done anything in contravention of, or failed to do anything in compliance with, any Order under this Act.

4. The Local Authorities under the Contagious Diseases [Animals] Act, 1869, with their respective districts, local rates, clerks, and committees, shall be, in like manner, Local Authorities for the purposes of this Act.

The Privy Council may, if they think fit, require a Local Authority to carry into effect any Order of the Privy Council under this Act.

The expenses incurred and compensation paid by a Local Authority in pursuance of any Order under this Act shall be paid by them out of the local rate.

Every local Authority shall keep, in such manner and form as the Privy Council from to time by Order direct, a record relative to proceedings in pursuance of any Order under this Act, stating the date of the removal or destruction of any crop or substance, and other proper particulars, which record shall be admitted in evidence.

5. Every Order of the Privy Council under this Act shall be published, if it relates to England, in the "London Gazette," and if it relates to Scotland, in the "Edinburgh Gazette;" save that, where the Order affects only specified lands, the insertion in the "London" or "Edinburgh Gazette" (as the case may require) of a notice of the making of the Order shall be sufficient.

Any Order of the Privy Council under this Act shall be published by any Local Authority, to whom it is sent by the Privy Council for publication, in such manner as the Privy Council direct, and subject to, or in the absence of, any such direction, in such manner as the Local Authority think sufficient and proper to insure publicity.

6. The powers by this Act conferred on the Privy Council may be exercised by any two or more of the Lords and others of the Privy Council, and, as regards the making of Orders affecting only specified lands, may be exercised by the Lord President or one of Her Majesty's Principal Secretaries of State.

IRELAND.

7. The foregoing provisions of this Act shall apply to Ireland, as if Ireland were named therein instead of Great Britain, but subject to the provisions of this section:

(1). The powers conferred on the Privy Council shall be vested in the Lord-Lieutenant, or other chief governor or governors, of Ireland, acting by the advice of Her Majesty's Privy Council in Ireland.

(2). The Local Authorities shall be the boards of guardians of the several poor-law unions.

(3). The expenses incurred and compensation paid by a Local Authority shall be paid by the treasurer of the union out of union funds; that is to say, out of any money in his hands to the credit of the guardians of the Union, and if there is not sufficient money in his hands, then out of the money next received by him and placed to their credit.

(4). Penalties (other than penalties recoverable under the Acts relating to the Customs) shall be recovered in a summary manner, and shall be applied according to the provisions of the Fines Act (Ireland), 1851, and any Act amending the same.

(5). Orders shall be published in the "Dublin Gazette."

GENERAL.

8. Every Order under this Act shall be laid before both Houses of Parliament within 10 days after the making thereof, if Parliament is then sitting, and if not, then within 10 days after the next meeting of Parliament.

9. The expenses of the execution of this Act, other than expenses and compensation paid by Local Authorities, shall be paid out of money to be provided by Parliament.

10. This Act may be cited as the Destructive Insects Act, 1877.

ALEXANDER ANDERSON, ESQ., has sold to Peter Jack, Esq., a beautiful thoroughbred Ayrshire heifer, out of Belle of Avondale by the Scotch bull Colonel, whose sire was Bismarck (the Scotch Bismarck), dam Maggie.

A CLUMP of the yellow-flowered weed known in Pictou County as "Stinking Willie" *(Senecio Jacobæa)*, was recently found in Upper Stewiacke.

AN Ayrshire Herd Book is about to be established in Scotland,—not before it is wanted. Instead of tracing back to "importations," we shall now have to trace to the. *Scottish Herd Book.*

BEARS are abundant about Milford, and the inhabitants are willing to give every facility to sportsmen to bag a few.

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