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COLORADO BEETLE.

**COPY of the REPORT of the Canadian Minister
of Agriculture on the COLORADO BEETLE; and,
COPIES of EXTRACTS of other PAPERS on the
Subject.**

(Mr. Stewart.)

*Ordered, by The House of Commons, to be Printed,
19 July 1877.*

[Price 8d.]

347.

Under 2 oz.

COLORADO BEETLE.

RETURN to an Address of the Honourable The House of Commons,
dated 29 June 1877;—for,

“ COPY of the REPORT of the Canadian Minister of Agriculture on the
COLORADO BEETLE :”

“ And, for COPIES or EXTRACTS of any other PAPERS on the Subject.”

Council Office. }
18 July 1877. }

C. L. PEEL.

MEMORANDUM of the Canadian Minister of Agriculture upon reference of a
Despatch of the Secretary of State for the Colonies, on the Subject of the
COLORADO BEETLE.

THE undersigned, in accordance with a request of the Secretary of State for
the Colonies, having carefully examined the Despatches of Lord Carnarvon,
respectively bearing date the 3rd of March 1875 and the 28th of August 1876,
has the honour to report as follows :

The occasion of considering measures for the prevention of the introduction
of the Colorado potato beetle into other countries from Canada has not yet pre-
sented itself, and the information from the German authorities, conveyed to Her
Majesty's Minister at Berlin, on the capture of the insect on board ships and at
Bremen, as well as other information given by newspapers relative to its intro-
duction into Sweden, shows that the beetles had come from the United States,
having been shipped at ports the neighbourhoods of which were invaded by
them.

The document furnished to Her Majesty's Minister at Berlin, a copy of which
forms part of the Despatch of the 28th August last, contains the following
remark

“ It may be considered an almost insoluble problem in regard to transatlantic
ships traffic to prevent by more extensive supervisory measures the introduc-
tion of these beetles in Europe.”

The difficulty thus foreseen by the German authorities cannot but be
self-evident when the habits and modes of progression of the insect are
examined ; for not only does it move by flying, and by navigating, so to
speak, smooth water, but also travels on common vehicles, railway carriages, and
platforms, on decks of vessels, &c., especially during the months of August and
September.

In localities fully invaded, the beetles may be seen creeping on side walks,
bridges, and wharves, crawling up buildings, occupying fences, lodging them-
selves in every crevice, penetrating houses and dwellings, ascending and occupy-
ing vehicles of all sorts, finding their way into boats and vessels, placing them-
selves on any and every article, and being found alive after a long sojourn in
situations where there would seem to exist no chance for them to find any sub-
sistence.

Such a short but correct *exposé* of the habits of the beetle as connected with
the possibility of its penetrating almost anywhere, and by almost any means of
transport, renders indeed insoluble the problem of absolutely preventing its in-
road into new fields of devastation, no matter how remote or by what obstacles
they may be separated from the regions already invaded.

It may be remarked in this respect that potatoes and their covering are
neither more nor less apt to harbour the insect than anything else.

But if the absolute repelling of the invader is unfortunately beyond reach, the

extent of the disaster is fortunately in a very great measure under control, involving, of course, care and expense.

The remedies which necessity has taught on this side of the Atlantic are such as to require for their application the joint effort of the community at large, kept alive to its interests and duties by the authorities, and men of devotedness to the common welfare.

These remedies are,—

- 1st. Searching for and crushing every potato beetle wherever found.
- 2nd. Frequent visits to the potato fields, and searching for the eggs deposited on the under side of the leaves of the potato vine, and
3. Watching for the presence of the larvæ on the buds, and on the leaves of the plant in order to destroy them by means of *Paris Green*, the only substance yet discovered to be effectually operative on a large scale for the destruction of the insect in its larva state.

By these means, and by these means only, the invaded American States, and the western part of Canada, have been able to secure potato crops in a measure commensurate with the care and energy bestowed and by similar means only can the invasion be retarded and lessened in its effects.

No measure has been taken in Canada, for reasons given, to prevent the falling or creeping of individual insects on board ships loading in Dominion seaports.

There is, however, almost a certainty that the environs of Montreal will be invaded next year, and with that prospect in view, general orders may be given to public officers and employés of the ports to look for and destroy any beetles which might be observed on the wharves, on sheds, on packages of goods to be embarked, or on board ships. A general appeal might also be made to all persons having to deal with the shipping for assistance in the execution of such preventive measures.

The undersigned respectfully recommends the adoption of such precautions, beyond which he does not see that there is anything within the power of the Canadian Government to do.

The whole respectfully submitted.

Department of Agriculture, Ottawa,
6 October 1874

(signed) *L. Letellier.*

(For Drawing of the Colorado Beetle, see Lithograph opposite.)

LETTER from Dr *J. Macdonald*, of Ontario, to the Secretary of State for the Home Department.

“ Sir,

“ London, Ontario, 24 May 1877.

“ WITH reference to the instructions which have been issued to the Commissioners of Customs on the subject of the Colorado potato beetle, I beg to suggest as a superior means to enable the officers of Customs to ascertain its identity, that they be provided with these insects preserved and enclosed in small glass cases. And, with a view to aid in carrying out this suggestion, should you think favourably of it, I shall, with this communication, enclose a few specimens which I have prepared.

“ I could furnish any number of such preparations. The country around this town is swarming with the beetle in question.

I am, &c.

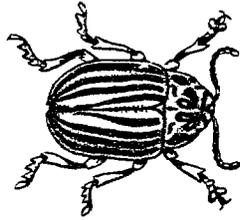
(signed) *J. Macdonald, M.D.,*
Drawer B 35, Post Office, London,
Ontario, Canada.

“ To the Secretary of State,
Home Department.”

“ P.S.— It might be productive of good results were preparations, such as those I have sent, distributed to landlords, holders of land, and to all parties having a direct interest in preventing the Colorado beetle from establishing itself in the United Kingdom. So doing would no doubt facilitate its detection, should it unfortunately be introduced, and, as a matter of course, its prompt destruction. It is a well known fact that this insect increases with extreme rapidity.

“ *J. M.*”

COLORADO BEETLE.



Magnified twice



Life Size

ENGRAVED ILLUSTRATION OF THE BEETLE WITH DESCRIPTION THEREOF
AS PREPARED BY
THE COMMISSIONERS OF CUSTOMS.



The above is an illustration slightly larger than the general size of the Colorado Potato Beetle.

The Color of the insect is Yellow with Black spots on the fore part, and ten Black stripes, five on each of the wing covers.

It is somewhat like a large Ladybird, but is rather longer in shape, and is also striped, which no species of the Ladybird is

The Insect if seen. to be at once crushed.

TELEGRAM from Mr. *H. MacDonell*.

“Berlin, 27 June 1877.

“MINISTRY of AGRICULTURE as yet possess no reliable information respecting appearance of Colorado beetle at Mulheim. They have sent Professor Gerstaker, entomologist, to investigate and report. Papers state Professor Foester of Aachen, has pronounced the insect to be the Colorado beetle. Shall report any further information I obtain.

“*H. MacDonell*.”

TELEGRAM from Her Majesty's Consul General at Düsseldorf, dated 28th June 1877.

“COLORADO beetle was found with larvæ numerous in a potato field near Mulheim. Yesterday, before the authorities, the field was fired with sawdust and petroleum. One beetle was seen on the wing. It is feared the plague may spread.”

LETTER from Her Majesty's Vice Consul at Cologne, dated 27th June 1877, and Translation of Reports from “Cologne Gazette” and “Stadt-Anzeiger,” &c.

“Sir,

“Cologne, 27 June 1877.

“I HASTEN to send you the different reports on the Colorado beetle, which I have found in the different editions of the ‘Cologne Gazette’ and the ‘Stadt-Anzeiger,’ supposing that they will give you a better insight into the present state of the approaching plague than a personal report could do.

“The Government, as well as the public, seem to take the matter seriously enough, so we will hope that their united endeavours will succeed in preventing further devastation.

“It seems to be a fact, that the insect found on a potato field near Mulheim, on the Rhine, belonging to a butcher, who imports American bacon, is the real Colorado beetle. The chrysalis of the insect appears in considerable, but the beetle itself in more confined, quantities till now, on about one-fifth of the field, which measures about 20 acres.

“It was reported that the insect had appeared already on another potato field near Mulheim. This, however, has been strictly contradicted in yesterday's evening paper.

“I shall follow up the progress of this lamentable discovery, and report further what may be of interest to you.

I have, &c.

(signed) *Wam. Hellmers.*

“To J. A. Crowe, Esq.,
Her Britannic Majesty's Consul General,
Dusseldorf.”

Enclosures.

THE COLORADO BEETLE.

“Cologne Gazette,” II. —25th June.

THE Colorado or potato beetle having been found near Mulheim, on the Rhine, as we reported in the first paper to day, it appears appropriate to recall to memory the following communications from an article on this dreaded destroyer of one of our principal means of subsistence, published in No. 45 of this paper in the year 1875.

The State of Missouri has appointed an entomologist, Charles Riley, who is to collect all observations on the subject, and to publish them. This is done in the “annual report on the noxious, beneficial, and other insects of the State of Missouri.” The last report, of the year 1875, gives the most recent information concerning the Colorado beetle. The insect passes the winter in the ground, but as soon as the potato plants are up and the

first leaves developed, the beetle appears. The female then lays her orange-coloured eggs in clusters of 10 to 12 on the underside of the leaves; from these eggs come the larvæ in five to eight days, and they carry on their work of destruction during 14 to 20 days. Then they change into the chrysalis state, and from 10 to 14 days afterwards the beetles come out. The deposit of eggs begins again, and so three generations may be produced in the course of one summer, the last of which hides in the ground and passes the winter there.

To the latest report, a Mr. Henry Gillman, of Detroit, Michigan, appends remarks on the attachment of the beetle to other plants. On the 19th of June 1872, he found it on young grass, upon which, as well as in the neighbouring potato fields, it had laid eggs. A month later he found beetles and larvæ close to a well-nigh ruined potato field, devouring the young blossoms and leaves of *cirsium lanceolatum*, *amaranthus retroflexus*, *sisymerium officinale*, *polygonum hydropiper*, *solanum nigrum*. After two or three weeks the thickest stalks of thistles were eaten away, nearly all the leaves destroyed, and the bloom heads hanging withered. At the same time he observed the insect on *chenopodium hybridum*, and *chenopodium album*, and in August of the same year, both beetles and larvæ greedily feeding on *hyoscyamus niger*, upon which eggs also were to be found. On this, Mr. Gillman observes that it is a significant fact that the insect takes to henbane, which was brought from Europe to America, therefore it does not seek out the native plants only.

These examples show what an extraordinary aptitude the beetle has to accommodate itself to its food, and to this circumstance is to be attributed the difficulty of extirpating it when it has once got a lodgment. The insect lived originally on the wild solanææ of the Rocky Mountains. As cultivation advanced towards the west, the potato fields drew nearer the habitation of the animal, upon these it settled, and, with the extended feeding ground, the insect increased with such inconceivable rapidity as to become a general pest to the country. In the year 1859, its progress towards the east had already begun, and the foremost parts of the swarm have now reached the Atlantic coast, whilst the main body has still some way to make. When this also arrives at the coasts it may be expected that the insect will pass over into Europe, and probably into Ireland first. In 1874 the migration continued without interruption, and in Ohio three or four swarms of this beetle were observed following each other in the course of an hour or two. Impartial observers estimate the number of a swarm at 10,000 insects. Some beetles remained behind as the flights passed on, the work of destruction began, and consternation spread amongst the agriculturists.

The means which have been adopted for the extirpation of the beetles are of three kinds.

1 Promoting the increase of the beetles' enemies. This, however, does not appear to have been successful, although nature comes to the aid of man, for with the insect the feeding ground of its enemy also extends, and thus promotes their increase.

2 Mechanical means. The simplest, and for a long time the only known defensive means was gathering by hand. But this is so expensive that it is only worth while when the price of potatoes is so high as to render them an article of luxury. "The New York Tribune" quotes instances wherein it took 50 days' work in the course of a summer to pick an acre, therefore about 120 would be required for a hectare. This would make picking impossible in Germany, even if school children were employed. The heavy expense has also led to the introduction of machines for gathering, such as tongs for crushing the insects and larvæ, boxes with springs to be fixed on the stems, small barrels with forked joggng apparatus, but none of them have been quite effective.

3 Chemical means. Of all these that have been tried, such as blue vitriol, green vitriol, chloride of lime, carbonate of lime, one has been very much approved of, that is Paris (Schweifunt) green (arsenated oxide of copper). It is used in two forms, dry and mixed with water; in the latter case a tablespoonful of pure green is reckoned for a bucket of water. In both cases it is mixed with flour to make it stick to the plants. The application of the dry powder is most advantageous, as it can be equally distributed over the plants by means of dieldgers, but the danger of poisoning men and animals is greater. Neither can the powdering take place at all times of the day, but chiefly on dewy mornings and in the evening. The application with water has, therefore, been more generally adopted, as it can be done at any time. This also has its disadvantages, which, however, may be decreased by clever operation: 1. Paris green is not soluble in water and therefore soon goes to the bottom, in order to prevent this, the liquid must be continually stirred while the sprinkling is going on. 2. The liquid rests in the hollows of the leaves and deposits the coloured matter too thickly. 3. Therefore much of it falls on the ground and is wasted. 4. It is not easy to mix the green, the flour, and the water, so that the flour shall not form clots. Therefore a special mixing apparatus is required. The success of this means is, however, so great, that the fear of the beetles' devastations has very much decreased, and as experiments have shown that the ground is in no way poisoned by the green, as was at first supposed, this means is now coming more and more into use. The expense is reckoned at about 12 marks per hectare.

We gather from a communication sent to us by Mr. Proff, of Mulheim, to-day, that the potato beetle has already been found in at least two neighbouring fields. Mr. Proff concludes his letter by requesting us to publish the intelligence at once (we had already done

done

done so), so that every exertion may be made by the Agricultural Ministry, as well as the Agricultural Society, to prevent the further spreading of the terrible pest.

The distinguished entomologist, Professor Dr. Forster, of Aix-la-Chapelle, to whom some beetles have been sent, says, with reason, "If the multiplication of the voracious insect goes on here as fast as in America, very soon no field in the Rhine province will be spared. This enemy must be destroyed, and even out-of-the-way means ought to be adopted to effect this." We have to state hereon, that we have already informed the Agricultural Ministry, by telegraph, of the appearance of the beetle here.

The Colorado beetles that have come into our possession we have placed at the disposal of the chief burgomaster. He will have them shown to the market people from the country, and likewise to the pupils of the public schools here, so as to promote the utter annihilation of the foe to our potato fields. A proposition made by an inhabitant here ought to be seriously encouraged, viz., that a good number of eggs, larvæ, and beetles be collected in glass cases, fed there, and then be subjected to experiment by chemists, to ascertain how they can be most easily and quickly destroyed. In addition to this, we would recommend that the collecting and taking away the beetles by officious persons be strictly forbidden, so that the insects may not be spread about through carelessness.

"Cologne News," 25th June.

We have received information from Mulheim, on the Rhine, that larvæ of beetles, and also beetle eggs, which to all appearance come from the Colorado beetle, have been found in a potato field near that place. The field belongs to a butcher who imports bacon from America, and it is, therefore, supposed that the said beetles have come over with the bacon. Further investigation will show how far this sad intelligence is true.

"Cologne Gazette," II.—26th June.

As the Colorado beetle has but just appeared in some places at Mulheim, a correspondent recommends, as a simple and effectual means, to cover the plots of ground in question with sawdust or dry tanner's bark, to pour a couple of casks of petroleum over it, and set it on fire, which would make the ground so hot that no living thing could remain in it. This would cost but very little for a parish or a district in comparison with the damage that would arise from neglect.

(See next communication.)

Cologne, 26th June.

As we have obtained accurate information to-day in our neighbour town of Mulheim, respecting the appearance of the Colorado beetle, we are able to impart the gratifying intelligence that as yet the destructive insect has only spread over a space of five acres in a large potato field containing 20 acres. In order to prevent the dispersion of the beetle, Mr. Landiath V. Reisevand will immediately have the infested plot placed under strict inspection, and on the arrival of the President of the Government, who will be at Mulheim at half-past four this afternoon, will take measures for the radical extirpation of the voracious insects, which for the most part occur in the larvæ shape, with but few specimens of the beetle. Probable the infested field will be covered with straw, hay, and shavings, and these be well saturated with petroleum, then the whole will be set fire to, and the ground afterwards purified by corrosive acids.

After close investigation, it appears that the fields surrounding the one in question have not yet been attacked by the mischief, and a statement that the beetle had been found on a distant potato plot turns out to be quite false.

Town Advertiser of the "Cologne Gazette,"—26th June 1877.

LOCAL NEWS.

On account of the immense importance of the matter, we repeat here the information given in the first issue of our paper yesterday, respecting the discovery of the Colorado beetle in a potato field near Mulheim; unfortunately, as will appear from the close of this notice, the dreaded insect has already appeared in other parts of our province. The owner of the Rhenish Asphalt and Coal Tar Works, at Mulheim on Rhine, Sturmergasse 10, Mr. Bernhard Zimmermann, wrote us yesterday, as follows: "A man came to me to-day with a little box containing several beetle larvæ of a peculiar form; he said he had found them in a potato field near Mulheim, and asked me whether I knew them. I remembered the descriptions of the American potato beetle published in the newspapers, and thought the appearance of the larvæ corresponded with them. I went at once with the man to the said field, and found eggs, larvæ, and full-formed beetles on the potato plants there. The larvæ are shining red, and show two rows of black spots on the two sides. The body of the beetle is likewise red, the wings yellow, with 10 black stripes lengthwise. The size of the beetles is about a centimètre, but I do not know whether they are full grown. Larvæ and beetles devour the potato plant with great voracity. It appears that the field belongs to a butcher who sells American bacon. This circumstance strengthened my opinion that the little voracious animal might be the Colorado beetle, the pest of the American potato fields, because I thought that the eggs of the insect might have come across the ocean in the packing of the meat, and then have got to the field."

Mr. Zimmermann brought with him to us a number of the larvæ that he suspects, and two beetles in a glass, and he has the beetle in all forms of development at his house ready for inspection. That we really have the wretched foe of the potato field before us we can hardly doubt, inasmuch as the beetle shows on its wingcases the 10 lines corresponding with its name of *doryphora decemlineata*. It is, therefore, of the greatest importance to adopt immediate measures for its extirpation. The Colorado beetles which came into our possession we have placed at the disposal of the chief burgomaster; he will have them shown to the market people from the country, and to the pupils of the public schools here, in order to promote a radical extinction of this enemy of our potato fields. A proposition made by an inhabitant here ought to be warmly recommended, viz., to collect a good number of eggs, larvæ, and beetles in glass cases, to feed them there, and then to have experiments made by chemists to ascertain the easiest and quickest way of destroying them. In addition to this, we would recommend that meddling persons be everywhere strictly forbidden to collect and carry away the beetles, lest they be spread about through carelessness.

“Cologne Gazette,” 27th June.

A LETTER from Mulheim tells us that “the state of affairs concerning the Colorado beetle is as follows: the larvæ feed in a restricted spot; they are mostly of a good size already. The pupæ rest in the ground, and send forth, as it appears, the beetles in daily, nay, hourly increasing numbers. These make all the surrounding country unsafe, for they are found beyond the feeding ground of the larvæ. Their dispersion is promoted by the wind, and still more, as well as that of the larvæ, by the numerous collectors, of whom a great many were present to-day, and they are not decreased by the shutting off. This is certainly not a time to rest in confidence; every day the danger increases by the hatching of the beetles, which, it is to be hoped, belong to the first generation. This is a time for energetic measures, such as those against the cattle plague.”

“Cologne Gazette,” 27th June.

As we obtained accurate information yesterday at noon, in our neighbour town of Mulheim, respecting the appearance of the Colorado beetle, we are able to give the satisfactory intelligence that as yet the destructive insect has only spread over a space of five acres in a large potato field containing twenty acres. In order to prevent the dispersion of the beetle, Mr. Landiath von Riese wand has already had the infested spot placed under strict inspection, and, after an arrangement with the President of the Government, will adopt measures for the radical extirpation of the voracious insects, which for the most part occur in the larva state, with only a few specimens of the beetle. Probably the infested field will be covered with straw, hay, and shavings, and these will be well saturated with petroleum, then the whole will be set fire to, and the ground will be afterwards purified by corrosive acids. After close investigation, it appears that the fields surrounding the one in question have not yet been attacked by the pest, and a statement that the beetle had made its appearance in a distant potato plot turns out to be quite false.

DESPATCH from Her Majesty's Consul General at *Düsseldorf*.

My Lord,

Düsseldorf, 29 June 1877.

No discovery has as yet been made as to the manner in which the Colorado beetle was imported into the field in which it was found on the 24th instant near Mulheim. The statement that the owner of the field, being an importer of American bacon, may have had Colorado beetles' eggs in his bacon cases is as yet the only plausible one that has been given. The field, which I visited yesterday, is a large one, but edged on one side by houses; one of them, I believe, the property and residence of the importer above mentioned.

As yet no signs of an extension of the beetle-plague have been discovered; but the authorities are apprehensive that it may spread, and they have issued a notice to the following effect:—

“The potato beetle (*chrysomela decemlineata*), commonly called the Colorado beetle, has undoubtedly been found in a field by Mulheim-am-Rhein. The ravages which this insect is well known to cause induce the issue of the following police order.

“1. Every owner, user, or lessee of fields planted with potatoes is bound to give notice of the appearance of the Colorado beetle, or its brood, to the police of his place of habitation” (Here follows a full description of the beetle and its larvæ and eggs)

“2. Whoever

“ 2. Whoever shall neglect this duty will be fined from 9 to 30 marks, or suffer proportionate imprisonment.

“ Neglect will be held to have been shown whenever, on revision, larvæ shall have been found in any potato field.

“ Koln, 27 June 1877.

(signed) *Guionnean.*”

I have, &c.

(signed) *J. A. Crowe.*

The Right Hon. the Earl of Derby,
&c. &c. &c.

LETTER from Mr. *MacDonell* to the Earl of *Derby*.

My Lord,

Berlin, 30 June 1877.

WITH reference to my telegram to your Lordship, No. 45 Commercial, of the 27th instant, on the subject of the appearance of the Colorado beetle at Mulheim, I have now the honour to report that in answer to my inquiries at the Imperial Sanitary Office, which has been entrusted by Prince Bismarck's order with the investigation of the matter, I have been informed that a report has been received from Dr. Sell, professor of chemistry, who was sent to devise the best means of destroying the insect.

Dr. Sell states that there is no doubt that the insect is really the much dreaded Colorado beetle, but that prompt means have been taken for its destruction in the field where it appeared, which is only of about the extent of one hectare.

The sanitary office have promised to furnish me with a copy of Dr. Sell's report on Monday, when I shall be able to send your Lordship further particulars.

I have, &c.

(signed) *B. G. MacDonell.*

The Earl of Derby,
&c. &c. &c.

LETTER from Mr. *MacDonell* to the Earl of *Derby*.

My Lord,

Berlin, 4 July 1877.

WITH reference to my Despatch, No. 46 Commercial, of the 30th ultimo. I have the honour to enclose herewith a précis of the report made by Dr. Sell to the Imperial German Sanitary Office, on the subject of the appearance of the Colorado beetle, together with a précis from the "Gazette of the Empire" on the same subject.

I have, &c.

(signed) *B. G. MacDonell.*

The Earl of Derby,
&c. &c. &c.

In his Report to Dr. Struck, the director of the Sanitary Office of the Empire, Dr. Sell states that he visited the field where the Colorado beetle was said to have appeared, and that there is no doubt that it is the much dreaded beetle, as Dr. Gerstäcker has also reported.

The field, which is about one hectare in extent, had been burnt with petroleum before Dr. Sell's arrival, and the vegetables in the neighbouring fields cut and burnt by way of precaution. On the day following, a search for traces of the beetle was almost without result, but the next morning from 40 to 50 larvæ and chrysalides were dug out in presence of the reporter and Professor Gerstäcker at a depth not exceeding from 10 to 12 centimètres.

Another burning of the field was to take place at once, and Dr. Sell proposed the application of an alkaline preparation composed of about 100 hectolitres of raw potash and limewash, which should be worked into the ground, and from which he promised a successful result.

In spite of every precaution which could be taken by the authorities there was still a fear that collectors or the curious might spread the evil, and with a view of preventing this a notice has been issued that all persons in possession

of larvæ or chrysalides should hand them over to the authorities, under pain of a fine; the public are also called upon to give any information in their power with regard to the existence of the insect; and all owners of potato fields in the mayoralty have been directed, also under pain of fine, to have them closely inspected at least twice a week.

Dr. Sell concludes by stating that, in his opinion, everything has been done on the part of the local officials which can entail the entire extermination of the plague.

Précis of Account in the "Gazette of the Empire" of the Colorado Beetles' appearance at Mulheim.

ON the 25th of June it became known to the authorities for the first time that a strange insect had appeared in a field close to the town of Mulheim, and that it was feared that it was the Colorado beetle, which turned out to be the case.

The piece of land attacked by the insect is about five hectares in extent, divided among different proprietors, and all planted with potatoes. It is bounded on one side by a road, and on the other three sides by pieces of ground planted with other vegetables.

The point at which the beetle was first found was in the middle of the potato ground, where it existed in great quantity and, with the exception of the chrysalis, in every stage of development.

The deep yellow eggs were on the under side of the leaves, while the larvæ were found on the upper.

These latter were of different sizes, from that of a small vetch, up to the dimensions of a coffee bean; and it was observed at the same time that all larvæ feeding on the same plant were of equal size with one another. Beetles were found in small number, and it appeared that they were not yet able to fly.

The most careful investigation respecting the manner in which the insect was introduced has hitherto been without success, but it is considered that its introduction by American bacon is improbable.

LETTER from Mr. Harris to the Earl of Derby.

My Lord,

The Hague, 5 July 1877.

I HAVE the honour to communicate to your Lordship the following statement, which has been published in the official gazette of the Netherlands by the Minister for the Home Department.

"While the steamboat 'Rotterdam,' with goods from New York, was being unladen at Rotterdam, an insect was discovered on the ground and sent up to the Home Department, where it has been declared to be a living female Colorado beetle, *Doryphora aecemlinata*

"The minister draws the attention of the public to the repeated warnings given by the Government, and to the description and engraving of the insect issued and published by the Home Department, and draws particular attention to the fact of the discovery of the above-mentioned specimen, and requests everybody to assist in preventing the general calamity that would result from the introduction of the Colorado beetle into the potato fields, by making inquiries, and by killing the injurious insect."

I have the honour further to state, from information just received from the Home Department, that the ship, in unloading which the above-mentioned insect was discovered, contained a cargo of general goods, and that the beetle was found on or in the vicinity of a chest of onions, that was subsequently destroyed.

Nothing else is known concerning the Colorado beetle; it has not yet made its appearance in the potato fields of this country.

An engraving, with a description of the insect, is herewith inclosed.

I have, &c.

(signed) E. A. J. Harris.

The Earl of Derby,
&c. &c. &c

DE COLORADO KEVER.



- a Eieren
- b Jonge larven
- c Volwassen larven
- d Kever
- e Vergroot dekschild

(Enclosure.)

(Translation.)

THE COLORADO BEETLE.

THE Colorado beetle (*d*), which has committed such frightful ravages in the potato fields of America, when seen from above, has the shape of our native green brass beetle, but it is a little larger, about 11 to 12 millimètres (7-16ths inch) long. Its colour is a flesh tint, red or ruddy dove colour, with black eyes, 18 small black spots and specks on the thorax, and five curved stripes lengthwise on each wingcase (*e*). The knees and tarses of the legs are black. The stripe along the suture of the wingcases is very narrow, the others are rather broad; the side edges of these stripes are not sharply defined, and between them are seen a good many fine diminutive black or brown speckles on the dove-coloured ground.

The eggs (*a*) are glued fast by the mother beetle to the underside of the leaves, in little clusters of 30, or a few more or less. They are rather more than 2 millimètres (1-13th inch) long, and 0.7 millimètres broad, smooth, deep yellow or orange colour, and of a cylindrical shape, rounded at both ends. Within five or six days the young larvæ (*b*) make their appearance from these eggs. At first they are blood red; this colour subsequently changes to a flesh tint. The full-grown larvæ (*c*) are between 8 and 9 millimètres (7-20ths inch) long, thick and swelling out behind the second ring of the body; projecting like a hump on the back, pointed at the end, bare all over, and without any pimples or warts. The circular shaped head, somewhat indented in front, is of a glossy black, with a whitish upper lip, four small black eyes on each side, protected by little bristly hairs; the upper jaw has five small teeth. The thorax is white at the fore edge, then black whilst the other longest part is flesh coloured, with many small olive brown spots, each separately formed of two specks. The remaining part of the body is flesh coloured or yellowish, with two rows of round black spots, one above another, at the sides. The six legs, of which the hindmost are rather long, have black hips and white thighs, with shanks and tarses black on the upper and white on the under side.

After having ravaged the plants for 19 days, or nearly three weeks, the larvæ, being full grown, creeps into the earth and turns into a chrysalis, from which, in summer, the beetle appears after 10 or 12 days. There are three generations every year, and the last spends the whole of the winter in the pupa state under ground.

If you meet with this formidable enemy of the potato field, in any shape whatever, kill it at once.

Published by the Home department.
