

trees; live specimens of coniferous or hardwood trees, and shrubs of new or recent introduction, suited to the climate of Scotland; fossil and geological collections; specimens and diagrams illustrative of the different formations and altitudes best adapted to the growths of various kinds of trees; samples of the commercial products of the woods, such as extracts, gums, oils, varnishes, resins, dyo substances, drugs, pulp, bark, foods, etc.; specimens of prepared and decorative woods, and any other objects pertaining to Forestry generally.

The importance of so interesting an Exhibition, in view of the establishment of a National School of Forestry in Scotland,—the necessity for which is universally admitted,—will be at once apparent, and, as it is essential to its success that there should be a large and influential body of Patrons, as well as an active local Executive Committee, we venture to hope that you will allow us to add your name to the list of Patrons, and favor us with your co-operation and support.

The Highland and Agricultural Society of Scotland, and the Scottish Arboricultural Society, have both appointed Committees of their Directors and Council to aid in promoting the objects of the Exhibition, and it is expected that other public bodies interested in the welfare of the country will also join in assisting to make so important a project a national success.

We have the honour to be,

Your obedient servants,

LOTHIAN, President.

ROBERT HUTCHINSON, Hon. Sec'y.

of Carlisle,

W. KINNAIRD ROSE,

Advocate,

JAMES JUNNER,

S.S. C.

JOHN McLAREN, JR.,

Sec. Scot. Arb. Soc.,

Acting
Secretaries.

THE Quarterly Meeting of the "Dartmouth Agricultural Society" was held on the evening of 6th June last. The Exhibition of last year having proved so successful, it was resolved that another one be held this Autumn in Dartmouth, under the auspices of this Society. The sum of two hundred dollars was voted for a Prize List, and a Committee appointed to solicit "Special Prizes," by which they expect to realize another hundred dollars. The Officers and Directors of the Society were appointed a Committee to make all the necessary arrangements for carrying out the undertaking. The exhibits of last year were very fine, and some of the members took prizes both at the Truro and Lunenburg Exhibitions, and no doubt, if they were to compete, they would receive prizes at the Dominion Exhibition to be held in St. John this year. It is to be hoped some of them will make the attempt.

EXPERIMENTS ON THE COLORADO POTATO BEETLE.

BY W. BRODIE, TORONTO.

The following interesting paper, giving details of experiments on the Potato Beetle, was read at a meeting of the Toronto Entomological Society:—

Gentlemen,—I herewith submit for your consideration a synopsis of a series of experiments, conducted by myself, intended to determine certain facts in the life history of *Doryphora 10 lineata*, about which there is a good deal of popular misconception.

The experiments were made in cages, where the natural conditions of temperature, light, and moisture were maintained as nearly as possible; the same cages in which I had successfully reared larvae of *Papilio troilus* and other delicate lepidoptera.

To secure greater accuracy, nearly every experiment was repeated, or two or more conducted simultaneously, and the results carefully compared and recorded.

The more important propositions supported by these experiments are:

First.—The potato is the only plant in Ontario on which the beetle can feed so as to become very numerous.

Second.—Food is necessary to the imago, in order to develop the reproductive functions.

Third.—If not supplied with food the imago will die in a short time—perhaps never exceeding two weeks.

Fourth.—The advent in Toronto of *Lydella doryphora*, by far the most reliable and valuable of all the enemies of *D. 10 lineata*.

It is so generally conceded that *D. 10 lineata* will not feed on the leaves of any of our forest trees, neither on any of our grasses nor cyperaceous plants that proofs of this need not be submitted nor discussed. The plants experimented upon, you will see, are mainly those which have been named as food plants by newspaper men, farmers and others.

Experiment 1.—Thirty mature beetles, after being kept without food for twenty-four hours, were supplied with leaves of carrot, parsnip, beet, pumpkin, lettuce, sunflower, sage, *Panicum crus galli*, and cabbage, for eight hours; none eaten; when supplied with potato leaves, all ate freely.

Experiment 2.—Thirty mature beetles, after being kept without food for thirty-two hours, were supplied for sixteen hours,—in addition to the plants named in experiment 1.—with red root, (*Amarantus hybridus*), sheephur, (*Cynoglossum officinale*), burdock, (*Lappa officinalis*), small bur, (*Echinospermum lappula*), sour dock, (*Rumex crispus*), *Lobelia syphilitica* and *L. inflata*, lambs quarter,

(*Chenopodium album*), mullein, (*Verbascum thapsus*); none eaten; when supplied with potato leaves all ate freely. This experiment was also repeated three times, with uniform result.

Experiment 3.—Thirty mature beetles, after being kept eleven days without food, were, in addition to the plants used in the second experiment, supplied with leaves of milk weed (*Asclepias Cornuti*), arrow head, (*Sagittaria variabilis*), Canada thistle, (*Cirsium arvense*), water parsnip (*Sium lineare*), golden rod (*Solidago nemoralis*), fleabane (*Erigeron Canadense*), cat mint (*Nepeta Cataria*), common plantain, (*Plantago major*), *Apocynum androsæmifolium*. None were eaten. When supplied with potato leaves, all ate freely. This experiment was repeated three times with unvarying results.

The solanaceous plants found in Ontario, outside of cultivation, on which it is generally admitted *Doryphora* will feed are the *Hyoscyamus niger*, *Physalis viscosa*, *Nicandra physaloides*, *Solanum nigrum*, *Solanum dulcamara*, *Datura stramonium*. It is very doubtful if *Doryphora*, either in the larvæ or imago state, will feed on the last two named. They are, however, all late plants, and would afford no food in the spring season, and so scarce that they would not feed the July brood for one hour.

Experiment 4.—Aug. 8. Took in fifty mature *D. 10 lineata* larvæ, forty-five of which had changed to beetles on August 26, while five had died in the pupating stage. These forty-five beetles were left without food; four died on the fourth day, thirty-seven were dead on the fifth day, thirty-nine on the eighth day, forty-two on the tenth day, forty-five on the eleventh day. Over 75 per cent. died within five days, the males dying first. No pairing took place, no ova were deposited, and no disposition to hibernate was evinced. This is the average of three cases conducted simultaneously, and which varied but little.

Experiment 5.—Aug. 8. Took in thirty mature beetles, all of which had partaken of food, and kept them without food. Two were dead in fourteen days; eight in nineteen days; thirteen in twenty-three days; sixteen in twenty-seven days; twenty-four in forty-seven days. Twenty per cent. survived forty-seven days' fasting; pairing occurred, and ova were deposited to a small extent during the first ten days. This is the average of three cases conducted simultaneously.

There is a very marked difference between this result and that of Experiment 4, where the beetles had never partaken of food.

Experiment 6.—August 15. Twenty pairs *Doryphora*, after being well fed,