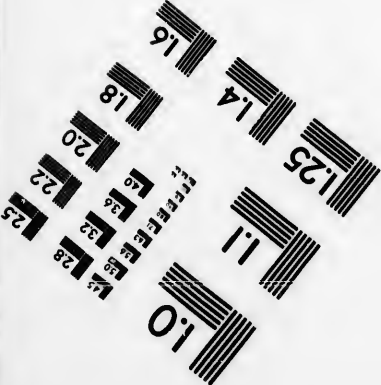
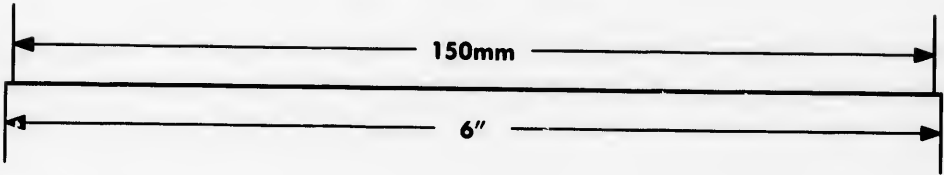
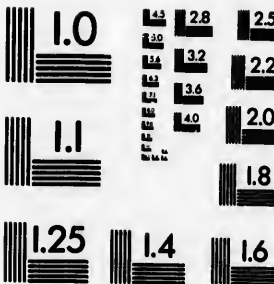
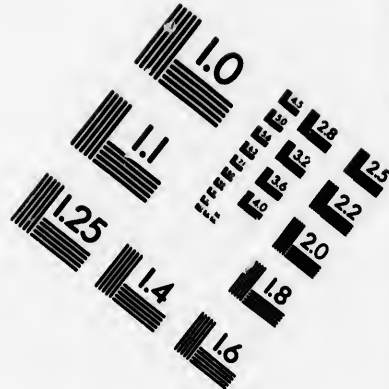
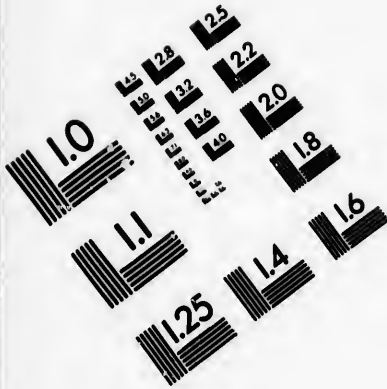


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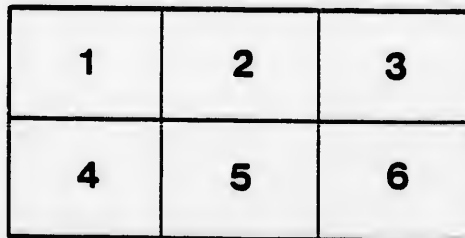
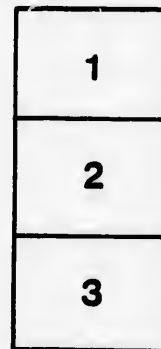
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REPORT OF INVESTIGATIONS IN MANITOBA AND BRITISH COLUMBIA,
AS ENTOMOLOGIST AND BOTANIST.

(MR. JAS. FLETCHER.)

OTTAWA, 1st September, 1895.

SIR,—I have the honour to report that, in accordance with instructions, I left Ottawa on June 22nd, and proceeded westward through Manitoba, the Northwest Territories and British Columbia to the Pacific coast. The object of my mission was primarily to investigate the occurrence or otherwise in British Columbia of the Codling Moth and San José Scale. With regard to the former, it was claimed by the officers of the Department of Agriculture in British Columbia that it did not occur in that province; but as it is extremely abundant and injurious in the Pacific States of the American Union, this immunity of British Columbia was a problem of great scientific interest, and one concerning which the observation and report of a scientific expert were deemed advisable.

Of the San José Scale undoubted specimens had been received at Ottawa for identification, with the statement that they had been collected in the Okanagan Valley. There was, however, room for doubt as to whether the insect still existed in British Columbian orchards. Owing to the extremely pernicious character of this pest, as shown by its injuries in the United States, definite information was much required, so that British Columbian fruit growers might be apprised of the danger of neglecting so serious an enemy, and advised as to the best steps to pursue should its presence be detected.

It is gratifying to be able to report favourably with regard to both of these subjects of my investigation. The keenest search possible in the time at my disposal, and much inquiry from those thought to be best informed, failed to detect either by their presence or by injuries committed that either the Codling Moth or the San José Scale existed in a living state in British Columbia. It cannot be denied with regard to the Codling Moth that this is a matter of much surprise and is quite inexplicable to me. As, however, it is apparently the case, it is a matter of much congratulation to the fruit growers of British Columbia, and shows the wisdom of the strict measures which are being enforced by the Provincial Board of Horticulture to prevent if possible the introduction of the pest from outside sources. There is little doubt that, with the increasing traffic with the United States and the other provinces of Canada, many of the pests of agriculture will in the course of time be introduced. Already many weeds not indigenous to the province have appeared in cultivated land, and have developed into aggressive enemies.

During the past season, I received specimens from the Fraser River country of the Eye-spotted Bud Moth; and during my expedition heard many complaints of the ravages of this insect, which before this year had not been reported from British Columbia.

Leaving Ottawa on June 22nd, I reached Nepigon at 7.40 p.m. the next day. I remained two days at this point examining the farm crops of the Hudson Bay Company and collecting specimens of insects and plants.

The hay crop was an excellent one, owing to the favourable season, and all garden produce was exceptionally abundant and of good quality. The only injurious insect of which the presence was particularly noticeable was what is known as the "Silver-top of Hay"; this was chiefly in meadows which had not been broken up for many years.

Leaving Nipigon on 25th June, I arrived at Winnipeg the following afternoon. The next day was spent with Mr. H. McKellar, the Deputy Minister of Agriculture, and I was pleased to be able to accept an invitation to accompany that gentleman the next day down the Northern Pacific Railway as far as Wawanosa, where I had an opportunity of being present and delivering an address at a Farmers' Institute meeting. The subject of burning interest at the time was noxious weeds. Mr. McKellar, who is a clear and forcible speaker, laid before the meeting what was the exact state of the provincial laws bearing upon this subject, the duties of weed inspectors and path masters, and also what was being done by the Manitoba Government to prevent the spread of the Russian Thistle and other weeds. On invitation of the chairman, I delivered an address on the different classes of weeds, their injuries and the best means of fighting them. The usefulness of this address was much increased by my being able to show specimens of many kind of weeds treated of, a large number of these having been brought in by farmers anxious to know their names and characters. Too much cannot be said of the energetic policy now being carried out by the provincial Department of Agriculture of Manitoba with regard to the subject of noxious weeds; it is probably to-day of more importance than any other agricultural question which the Manitoba farmer has to consider. This was evidenced by the close attention paid to Mr. McKellar's address at Wawanosa. On the return journey, we had the good fortune of travelling with Mr. J. F. Riley, the roadmaster of the Northern Pacific Railway, who has taken a keen and practical interest in this matter, as is shown by the remarkably clean condition of the track. If the farmers of Manitoba would do the work of fighting weeds only half as well as this railway, it would be a great advantage to the province. Mr. Vanderslice, the division superintendent, is also displaying much interest in this subject. He gave us every facility possible in making our investigation and asked us to let him know of anything further that could be done.

Before leaving Wawanosa, we had an opportunity of seeing some of the grand farming country in the neighbourhood of that town. Early on the morning of the 29th of June we were met by Mr. R. Parks, the weed inspector of that district, with a team of fast horses and driven for three hours to various localities where weeds had been observed. In this drive of about 17 miles we were able to see that the farms in this district were exceptionally clean of weeds, a fact which was an evidence not only of the wisdom of the farmers, but also of Mr. Parks's energy. One spot of particular interest was the exact locality on the Northern Pacific Railway where the so-called "Russian Thistle" had been detected last year. Several young seedlings were found on the railway bank, but the patch was being carefully watched by the railway authorities. It had already once been hoed over, and this operation was to be repeated every week as long as any plants appeared.

One of the most important results of this journey was the detection in alarming abundance of the Tumbling Mustard (*Sisymbrium Dinapistrum*) in Manitoba, in the district lying between Morris and Myrtle. Immediately on our return, a bulletin on the subject was prepared and issued by the Honourable Minister of Agriculture for Manitoba.

Monday, the 1st of July, was spent collecting specimens and examining farms in the direction of Silver Heights. Many weeds were observed, those aggressively abundant being without exception introduced species, chiefly belonging to the Cress family, and from Europe. The following day I left for Brandon. July 3rd was spent at the Experimental Farm, examining the crops and collecting.

Finding that it was necessary for me to return to Brandon to attend a joint meeting of the Central Farmers' Institute, and Provincial Teachers' Association, to be held at that place on the 9th, 10th and 11th of July, I proceeded to Indian Head on the 3rd. The 4th, 5th and 6th were spent with Mr. Mackay in examining the

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Experimental Farm and driving through the district, making observations on the occurrence of noxious weeds and insects. A pleasant visit was paid to the Indian Industrial School near Fort Qu'Appelle on the 4th. The most noticeable weeds in this district were the Tumbling Mustard and the Hare's-Ear Mustard (*Erysimum orientale*), two most aggressive members of the Cross family which have been introduced into this district and have been allowed to spread to a most alarming extent. Every effort was made to draw the attention of settlers to the danger of neglecting these plants. It must be acknowledged that for some reason there has been in the past great negligence on the part of many in this respect. This may be partly due to the fact that the Tumbling Mustard had been generally spoken of in the district under the name of Tumbling Weed, an appellation which really belongs to a member of the Amaranth Family, which is not nearly of so pernicious a nature as the Tumbling Mustard, so that many, when hearing the Tumbling Mustard spoken of as simply Tumbling Weed, had supposed that it was merely the ordinary Tumble Weed of the West, and had neglected to fight it whilst it occurred only in small numbers. Hare's-Ear Mustard was also attracting much attention, and specimens had been sent in to Mr. Mackay from many farms for identification, some of these at points more than twenty miles from the railway.

I returned to Brandon on the 7th of July. On the 8th, I visited the Experimental Farm, and in the afternoon was driven by Mr. Bedford to see some of the farms in the neighbourhood. The following morning, upon invitation of the reeve, I went with Mr. Bedford to the City Hall and delivered an address before the municipal council upon noxious weeds, which was listened to with interest. The next three days were taken up in attending meetings of the Farmers' Institute. This convention was most successful and was largely attended by the best farmers of the province. I delivered two addresses, one on the evening of the 10th in the City Hall, and another at a large out-of-door meeting held on the Experimental Farm on the 11th. This latter meeting was attended probably by seven or eight hundred people, and, besides my own address, excellent speeches were made by the President of the Institute and the Hon. Clifford Sifton, Attorney General for Manitoba. The convention closed on the 11th and I continued my journey westward.

Beautiful flower gardens were noticed along the route, particularly at Indian Head, Moose Jaw and Regina, many common garden annuals, such as petunias, stocks, Portulaca, sweet peas, marigolds and phlox, flourishing with great luxuriance. Owing to the late and copious rains, the prairies this year from Manitoba to the Rocky Mountains presented one continuous expanse of beautiful verdure. A constantly changing panorama passed before the eyes of one looking out from the railway train. The soft green of the waving grasses which clothed the immense plains and rolling hills, was varied by a succession of charming prairie flowers of every hue, sometimes in single specimens, at others spreading out into gorgeous patches of acres in extent. Everywhere wild prairie roses, only a few inches in height, but a mass of blossoms shading from pure white to deep red, patches of Painted Cups (*Castilleja*) flaming scarlet or rose pink. On islands and on clay banks rose purple masses of Spider Plant (*Cleome integrifolia*) were seen, and here and there spikes of White and Yellow Evening Primroses, myriads of Orange Lilies (*Lilium philadelphicum*), or sturdy spikes of Blazing Star (*Liatris scariosa*) among these the slender prairie clovers *Petalostemon violaceum* and *P. candidum* threw up their bright heads of crimson or white flowers beset with golden anthers. Clumps of purple or yellow *Astragal* and tufts of the pink flower spikes of *Hedysarum boreale*, standing up above the tops of the prairie grasses. Following the course of a trail or of a dried up slough were bands of bright yellow "Rosin weed" (*Grindelia squarrosa*). Large patches of the silver-leaved Sweet Sage (*Artemisia frigida*) showed where land had been broken and then neglected; in similar places could be seen rank Chenopods standing high up above the surrounding vegetation. Where alkali patches occurred, the snow-white deposit was frequently circled with a ring of blood red samphire (*Salicornia*) or one of the many western species of Orache (*Atriplex*). Objects of great beauty were large beds of the troublesome Skunk-tail grass (*Hordeum jubatum*) of which the pale green silky heads now fully expanded and touched by late frosts

bad taken on a ruddy purplish tinge. Around gopher and badger holes the attractive terracottared flowers of the Badger Plant (*Malvastrum coccineum*) were frequently seen, and also the less showy but pretty *Gaura coccinea*, of which the flowers vary from crimson to white in different patches. In places, grand dark-eyed *Gaillardias* stood up in every direction, across the prairie, vying with the golden-eyed *Chrysopsis*, wild sunflowers, Arnicas and early Golden Rods in turning the plains into a veritable Field of the Cloth of Gold. Naturally, in travelling so great a distance the vegetation seen was not always of the same description, and the nature of the soil could be easily detected by the different kinds of plants growing on it.

Leaving Brandon on the morning of the 12th, my next stopping point was Calgary, where collections were made of insects and plants. On Monday, the 15th, I made a most interesting expedition to Olds, about 60 miles north of Calgary, where the forests of the north come down and touch the great prairies. Here, through the kindness of Mr. T. N. Willing, I was able to see some of the farms and make valuable collections of plants and insects. I was particularly struck with the abundance and luxuriance in this district of many kinds of grasses and especially of the Western Brome Grass (*Bromus Pumpellianus*), an excellent grass, both for hay and pasture, and closely allied to the now celebrated Awnless Brome Grass, introduced from Europe, which has given so much satisfaction wherever tried in Canada. I returned to Calgary on the night of the 16th. It rained hard all day on the 17th, so that outdoor observations were impossible.

The 18th was spent at Banff, where, thanks to the kindness of Col. Herchmer and Mr. Harper, of the North-west Mounted Police, I was driven to the chief points of interest. Many rare plants were collected here and despatched to Ottawa. The following day, the 19th, was spent at Laggan, a most prolific locality for the naturalist, where several species of alpine plants and insects were collected. One mountain, St. Brien, over 9,000 feet in height, but of very easy ascent, gave a good opportunity for examining the different plants characteristic of varying altitudes. I left Laggan on the morning of the 20th and reached Glacier at 1.40 p.m. on the same day. The afternoon was spent in visiting the great glacier, where most interesting observations were made on the flora of the sides and moraine of the glacier and of the woods and mountain sides adjacent. Some of the more remarkable plants which may be mentioned, are *Rubus Pedatus*, an alpine raspberry of which the graceful procumbent vines form thick beds running over the moss covered rocks and prostrate tree trunks lying in the damp ravines. The most striking plant, however, is the beautiful white-flowered Rhododendron (*Rhododendron albiflorum*), a large bush which grows abundantly on the wooded mountain sides, and at the time of my visit, had all its branches heavily laden with a profusion of the delicate greenish-white bell-shaped flowers over half an inch in diameter. At the foot of the glacier were large beds of *Veratrum viride*, the plant from the root of which the White Hellebore of commerce is made. The large handsome oval and strongly ribbed leaves which are borne on stems from two to five feet high surmounted by a panicle of green flowers give it almost a tropical aspect, a great contrast to most of the surrounding vegetation. Mention must also be made of the beautiful "Selkirk Lily," as it has been styled (*Erythronium grandiflorum*), which bears large, golden yellow, lily-shaped flowers, one or two at the top of a single stem six to ten inches high thrown up from between two handsome green leaves. This plant is by no means confined to the Selkirk Mountains but occurs right through to the coast range. Living roots were also obtained of the rose-coloured variety of the Birch-leaved Spiræa. Two conspicuous and beautiful flowering plants were in profusion growing among the gravel close to the glacier. These were *Mimulus Lewistii*, with large, crimson flowers over an inch in length, and the Wide-leaved Willow-herb (*Epilobium latifolium*). All of the above are well worthy of cultivation as garden plants.

On the 21st, I reached Sicamous on Great Shuswap Lake and remained there over night ready to take the early morning train to the Okanagan Valley. Starting the next morning by the Shuswap and Okanagan railway, which runs along Mara Lake and the picturesque Spallumcheen River, we entered the fertile Okanagan

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district. Wherever water occurs or can be applied, crops of all kinds flourish with the greatest luxuriance. Grain cutting had just begun and enormous crops of wheat, barley and oats were being reaped. Vegetables of excellent quality were seen near Enderby, Armstrong and Vernon. At Enderby I had the good fortune to meet Mr. R. M. Palmer, inspector of fruit pests for British Columbia, and Mr. T. G. Earl, of Lytton, a member of the Provincial Board of Horticulture. These gentlemen were on a tour of inspection and allowed me to accompany them. They furnished me with a great deal of useful information, particularly with regard to the farms and localities which it would repay me best to visit. Being well acquainted with the district, they were also of great use to me in many other ways. About noon we reached the terminus on Okanagan Lake and took the steamer for Penticton. An opportunity was afforded for visiting the Salvation Army mission on the west side of the lake by the steamer stopping for half an hour to take wood. At Kelowna, Messrs. Palmer and Earl left me and I went on to Penticton, which place was reached about 6 p.m. Here I was met by Mr. C. DeBlois Green, a surveyor and enthusiastic naturalist, and later in the evening we rode out 15 miles to his camp at Okanagan Falls on Dog Lake. The next two days were spent in collecting plants and insects. The country around Penticton is a bunch grass country, and, although hot and dry, the soil is excellent and, where water is available, magnificent crops of the best quality can be raised. Quite close to Penticton, in the garden of Mr. T. Ellis, plums, apples and cherries of the finest quality were seen, and a heavy crop of hay was being carried as we passed. The bunch grass of the district, which covers all the rolling hills and runs high up on to the mountain sides, is the Western Rye grass (*Agropyrum tenerum*), a most nutritious and valuable species. In some low spots we saw slight traces of alkali and there were remarkable tufts of the coarse grass, *Elymus condensatus*, forming a jungle of bunches of stiff leafy stems two and three feet through by ten to twelve feet high. Among these occurred patches of the Western Bull thistle (*Onicus undulatus*), the flowers of which attracted numerous specimens of the handsome butterflies *Argynnis Leto*, *Papilio Oregonia*, and *P. Daraus*. The sides of the hills all through the district are curiously lined and marked with horizontal benches about a foot apart made by cattle grazing there. Among the wild plants of interest were a small cactus with very sharp barbed spines *Opuntia fragilis*, and a large composite *Balsamorhiza Sagittata*, called like almost every other yellow-flowered plant in West, "Wild Sunflower." Upon the dead, dry leaves of this plant the ponies feed ravenously seeming indeed to prefer it to grass, even when the leaves are so dry as to rattle with a metallic cling when kicked or touched in passing. Around Okanagan Falls both of these plants were plentiful and also, as was to be seen by the dried up flowers, called *Spaethum* by the Indians and used as an article of food, *Lewisia rediviva*, a beautiful and interesting plant allied to the Portulaca of our gardens. On the hill sides were many members of the Vetch family, and the slopes of the mountains were made picturesque by grand specimens of the Bull Pine (*Pinus ponderosa*). Along Dog Lake a remarkable sight presented itself of these trees being surrounded with myriads of specimens of a beautiful white butterfly voided with black, *Neophasia Menapia*, the caterpillar of which in the interior of British Columbia and in the States immediately to the South, feeds on the foliage of *Pinus ponderosa*, but, as I observed later, on Vancouver Island, is equally abundant and much more injurious apparently, to the Douglas Fir, *Pseudotsuga Douglasii*.

All through this district, game is most abundant; Big-horn, Rocky Mountain goats and deer are frequently obtained by hunters; grouse, wild ducks and other water fowl abound. A remarkable fact was brought to my notice by Mr. Green and vouched for by many others, that in this valley wild geese frequently lay their eggs in the nests of the osprey which are perched high up on the tops of trees. To account for this exceptional location, the suggestion has been made that it is to avoid the rattle snakes, which are common throughout the valley.

On the 23rd, I visited, with Mr. Green, a farm two or three miles to the south and saw excellent crops of peas, oats and hay.

I returned to Penticton on the evening of 24th July, where I again met Mr. Palmer. Leaving by steamer the next morning, we were joined a few miles after we started by Mr. Earl, who brought with him some ripe peaches of fair quality which had been grown in the neighbourhood. We reached Kelwona or Okanagan Mission about mid-day and at once drove out to Guisachan, the extensive fruit farm of His Excellency the Governor General, over which we were kindly shown by Mr. Morrison, the manager. We visited the large and well kept orchards and small fruit plantations; the raspberries were fully ripe, in great profusion and of excellent quality. The hop plantations were examined and specimens taken of a peculiar disease which attacks the roots. This ailment shows itself in the shape of large, swollen galls on the roots and a weakening of the vine. No insect or fungus could be detected as the cause, and the matter is still under investigation. It was found to occur more or less in all the hop grounds of the district. Red Clover and orchard grass were noticed growing well on the Guisachan estate.

Part of the afternoon was spent in visiting the fruit farms of Messrs. Creighton Bro., Rose Bros., Pridham, Crozier and some others; special examination was made for traces of the San José Scale, but none were found. In the evening a public meeting was held in the town of Kelowna. This was well attended by the leading fruit growers of the district. Addresses were delivered by Mr. Palmer, Mr. Earl and myself. Many questions were asked with regard to insects, weeds and fodder grasses. The Eye-spotted Bud Moth was complained of and its habits were explained and the best remedy was given. The only insect noticed by me to be abundant was a gray aphid on the young growth of plums. Particular mention was made of one weed, the Prickly Lettuce (*Lactuca Scariola*), which had been introduced into the valley and was now a conspicuous object on some farms.

The following morning we left Kelowna and drove to Vernon, 36 miles, by the Dry Valley and Long Lake road. This gave me a good opportunity of seeing some more farms of the district, those of Messrs. Postill, showing what good results could be obtained by progressive farmers. The thriving town of Vernon was reached at 4 o'clock, and we accepted an invitation from Mr. Edward Kelly, the chief manager of Lord Aberdeen's estates in British Columbia, to visit the Coldstream Ranch a few miles from the town. This ranch consists of about 10,000 acres, much of it of excellent land suitable for any kind of agriculture. The experiments in fruit growing have been most successful, plums, pears, apples and all kinds of small fruits growing with great luxuriance. The hop grounds were undoubtedly in the best condition of any of those seen by me in British Columbia.

There are also on the ranch excellent ranges for both cattle and horses; and, at the time of our visit, a magnificent crop of barley, wheat and oats was being harvested.

We remained at Vernon three days, during which time many of the farms and fruit gardens in the district were visited, all of which showed the great fertility and the suitability of this region as a prosperous agricultural centre.

On the 29th of July, a visit was paid to the "B. X. Ranch" belonging to Mr. Frank Barnard, M.P., who has a large orchard in good condition under the management of Mr. Isaac E. Haun.

As a general report on this fertile region it may be said that all crops are remarkably exempt from the attacks of injurious insects and fungous diseases, and the fruit growers and farmers appear to be very progressive, as is shown by the ready way in which they have adopted the new methods of farming and protecting their crops against the well known agricultural pests.

Leaving Vernon on the afternoon of the 29th, we reached Lytton the next morning and spent the day most profitably at Mr. T. G. Earl's home on the west bank of the Fraser River. Mr. Earl is one of the most successful fruit growers in British Columbia, which is due to his long experience and many patient experiments. He has over 2,000 trees in his orchard, including many varieties of apples, pears, plums, prunes, cherries and some Russian apricots, which were ripe at the time of our visit. All of these are grown under irrigation, and Mr. Earl attributes much of his success in growing fruit trees to a heavy crop of clover which he grows in his

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orchard beneath the trees and which acts as a mulch. In addition to the above, Mr Earl has over 500 grape vines, upon which there was a fine show of fruit.

On the 31st of July we reached Agassiz, where three days were most profitably spent in examining the work and crops on the Experimental Farm, and in attending the meetings of a joint convention of the Fruit Growers', Farmers' and Hop Growers' Associations of British Columbia. At this meeting, which was presided over by His Honour the Lieutenant Governor, and attended by the Acting Minister of Agriculture, Col. Baker; the Deputy Minister of Agriculture, Mr. J. R. Anderson; and most of the leading fruit growers of the province, I had an opportunity of gaining much useful information from the discussions at the convention and by private conversation. I had the pleasure also of meeting many of my own correspondents, and made a point of inquiring particularly as to the occurrence of the Codling Moth and the San José Scale. My own observations were here confirmed and no trace of either of these pests could be heard of. I delivered two addresses at the convention; one upon injurious insects and the best methods of preventing their injuries; the other, on agricultural grasses, a subject of much interest in British Columbia. On the afternoon of the second day, at the request of some of the fruit growers, and at the suggestion of Mr. Saunders, who also was present at this convention, I gave an exhibition of some of the best spraying nozzles.

The wonderful crops of all fruits on the Experimental Farm were admired by the visitors. Some varieties of plums, apples and peaches, which were ripe at the time, were distributed among the visitors by Mr. Sharpe, and a chance was thus afforded of testing their excellent quality. The flowers and ornamental shrubs also were objects of great interest. An expedition was made up the mountain at the back of the farm on the afternoon of the last day to inspect an important experiment, which has been carried out by Mr. Sharpe, of planting fruit trees on upland benches and mountain ledges. He has four orchards of various fruit trees, planted at different elevations approximately as follows 50, 150 feet, 500, 600 feet, 800, 850 feet and 1,000 and 1,050 feet. If this experiment should prove a success, as present appearances seem to indicate, it will make available for the remunerative husbandry of fruit growing thousands of acres of most valuable land in British Columbia which up to the present have been entirely neglected.

On the morning of Saturday, the 3rd of August, I left Agassiz and reached Victoria the same night. Monday, the 5th, was spent in the Department of Agriculture with the Deputy Minister and Mr. Palmer. On the morning of the 6th I went to Nanaimo, where I remained until the morning of the 8th, and delivered a public address on the morning of the 7th. Friday, the 9th, was spent in visiting the orchards and farms around Victoria, through the kindness of Mr. Lamberton, who saved me much time by driving me to the chief points of interest. His own extensive fruit orchards were visited at Mount Tolmie, as well as the long established and thriving nursery of Mr. G. Knight, the farms of Mr. Edward King and several others. Most interesting investigations were made at Mr. John Tolmie's, Cloverdale. A remarkable sight was seen on Mr. Tolmie's estate; the fine oak groves for many acres were almost defoliated by the black and white caterpillars of the Vancouver Island oak-looper (*Ellopija somnaria*). Upon tapping a bough of a tree hundreds of these caterpillars would drop from such remnants of leaves as were left and hang in the air on silken threads. The injuries of this insect are very great and have for many years recurred at short intervals in the oak groves around Victoria. When they reach their culminating point of abundance, they are suddenly brought down to their normal degree of occurrence by two or three species of parasite insects and by a disease due to a fungus *sporotrichum globuliferum*, a parasite which has been used economically with great effect in controlling the Chinch-bug, so injurious to crops in the Western States.

Before leaving Victoria, through the kindness of Mr. B. Williams I was also enabled to visit the nursery of Mr. Leyritz, who has a nice collection of ornamental trees.

On Saturday, the 10th, I accompanied Mr. Anderson and his assistant, Mr. E. Carew-Gibson, to Shawnigan Lake about thirty miles distant from Victoria. The

day was spent in collecting plants and insects. Here again the white butterfly (*N. Menapia*) which had been observed in such large numbers around the Bull pines in the Okanagan Valley, was seen in countless numbers flying around the Douglas firs. The trees had been perceptibly injured by the caterpillars which had transformed into the butterflies now seen, but of which there were still some feeding on the foliage, or letting themselves down from the tops of the tall trees by means of silken threads; in some instances these threads must have been of the remarkable length of 100 feet or more. The green and white chrysalids were found on the undergrowth, ferns, shrubs, etc., in large numbers. Many caterpillars also doubtless pupated in the trees without descending. I was pleased to detect here specimens of a parasitic Ichneumon fly (*Theronia fulvescens*), which was by far the more numerous of three parasites I had observed depreeding on this insect in the upper country, and of which I had bred many specimens from the pupæ of the butterfly. Many rare ferns and other plants were secured at this interesting locality. In a small swamp numerous specimens were found of the rare *Gentiana septem*, and the sweet scented orchid *Habenaria leucostachys*, called locally "wild hyacinth." In the woods tall bushes of the beautiful scarlet-berry "wine berry," *Vaccinium parvifolium*, covered with fruit, presented a striking appearance. No less noticeable were heavily loaded bushes of the Salal berry (*Gaultheria shallon*) and the Oregon grape (*Berberis aquifolium*).

The beauty and charm of the deep luxuriant woods on Vancouver Island cannot be described in words; they must be seen to be appreciated. Towering above are gigantic conifers, cedars, firs, spruces, pines and hemlocks raising their heads 200 and 300 feet in the air, with trunks many of them from 6 to 8 feet in diameter, and in exceptional specimens of cedar, more than double that size. Beneath these giants smaller trees and bushes flourish. Of the smaller trees, perhaps the most remarkable is the graceful and useful western flowering dogwood (*Cornus Nuttallii*), which forms a stately, slender tree from 40 to 60 feet in height, and spreads out its many long branches with the tip of each little branchlet surmounted by one large involucre flower cluster, in shape not unlike an enormous white daisy; the showy white petuloid involucre are sometimes 6 inches in diameter, and when fully mature are of a snowy whiteness. In the dim light beneath the tall conifers these flowers gleam like stars of silver. The bark of this dogwood furnishes a valuable remedy for ague, which is well known and has been often used by travellers as a substitute for quinine. Another tree of which specimens were collected in Vancouver Island was *Rhamnus Purshiana*, valuable for its ornamental foliage and even more so for medicinal qualities, for from this tree is produced the drug *Cascara Sagrada*, or sacred bark. Many flowering shrubs highly esteemed in gardens are found growing wild in the woods and on the mountain sides in Vancouver Island. *Philadelphus Lewisii*, familiar under the horticultural name of *Syringa*, grows in the greatest profusion, mingled with the flowering currant (*Ribes sanguineum*), the salmon berry (*Rubus spectabilis*), and the most beautiful of the meadow-sweets *Spiræa discolor* (var) *ariaefolia*, a tall bush covered with feathery masses of white flowers. With the above grow many shrubs and herbaceous plants of great beauty, too numerous to mention, lilies, lupines of several species, *Delphiniums*, *Asters*, orchids, and last but not least, an almost tropical growth of ferns and mosses, which together give a profusion of vegetation of the greatest interest to botanists and lovers of flowers, not to be surpassed, I believe, in any other part of the world.

I beg here to gratefully acknowledge the valuable assistance and many courtesies received during my short stay in Vancouver Island, from Mr. J. R. Anderson, the Deputy Minister of Agriculture, and Mr. R. M. Palmer, by which I was enabled to save much time and learn far more about matters of use to me in my official duties, than would otherwise have been possible.

On the evening of the 11th of August, I reluctantly left this land of beauty and turned my steps homeward. Owing to the peculiar arrangements of the steamship service, I did not arrive in New Westminster until 7 o'clock the following evening, instead of at the same hour in the morning. I thus missed my train and was

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deprived of the pleasure of joining a party in what would have been a most useful and instructive trip up to the summit of Mount Cheam at Agassiz. The delay, however, gave me an opportunity of a few hours collecting at Plumper's Pass, and a view of the salmon fishing fleet, as well as the salmon canneries in full operation at the mouth of the Fraser River. I left New Westminster on the 13th, reaching Agassiz the same evening. The following day the Harrison Hot Springs were visited and seeds and roots of many interesting western plants, particularly grasses, were collected and despatched to Ottawa. My next stop was at Calgary, where I spent one day and made further collections of botanical specimens. My attention was here drawn to a very beautiful lawn in front of the Ranchers' Club, showing that with sufficient water the very best lawns can be grown in this district. The grasses employed in making this lawn had evidently been *Poa pratensis*, which is undoubtedly the best grass for this purpose in all temperate climates; a little Meadow Fescue, which would have been far better omitted on account of its tufty growth; and white clover, which also thrives well in the west wherever it can obtain sufficient moisture. Indian Head was reached on the night of Saturday, the 17th. The following day further observations were made on the condition of the crops and noxious weeds, for comparison with notes taken during my former visit in July. I was disappointed to find that little has been done—outside of the Experimental Farm, on the Brassey farm and by Mr. Geo. Lang—in destroying the Tumbling Mustard. No opportunity was lost in again trying to convince everyone I met of the great danger of neglecting this weed. Prof. John Macoun, who happened to be at Indian Head at the same time, also spoke strongly in the same direction. In crossing the plains from Calgary to Indian Head a great change was noticed in the aspect of the prairies. In July the prairies were one vast flower garden; but now the grass that was then green had become brown and sere, and in place of the roses and red and white summer flowers, were wild Sunflowers, Golden Rods and Michaelmas-daisies. Heavy crops of grain just beginning to ripen were in the critical stage of development which justified the universal feeling of intense anxiety which was everywhere to be noticed. As night approached on the 18th, the wind dropped under a cloudless sky and the temperature gradually fell towards the freezing point. Never before in the history of the country had there been such promise of a bountiful harvest in Manitoba and the North-west Territories. If the frost would only keep off for another week, it was felt that a great part of the grain would be safe from injury. Everything depended on the weather; and, when after three or four days of low temperature without any appreciable injury having been done to the crop of the country, warm harvest weather again set in, the universal feeling of relief was almost indescribable.

I arrived at Brandon on the morning of the 19th, the date upon which it has been claimed that injury was done by frost; but, although there was certainly a slight hoar frost visible on the platform of the station at 5 o'clock in the morning, I noticed later in the day, that Indian corn growing close to the railway, was quite uninjured. The harvest was now in full swing at the Experimental Farm and indeed throughout Manitoba. It was a magnificent sight to look out as far as the eye could reach, upon thousands of acres of golden grain, either being cut or standing ready for the reaper.

I may here, perhaps, be permitted to mention the very evident and universal satisfaction which was expressed, both in public and in private, of the work of the Experimental Farms in the west, and of the skill, tact, and courtesy of the superintendents in charge. This was naturally, a very great pleasure to me, and I felt proud of belonging to an institution which, although a government undertaking, was recognized and fully acknowledged by all, whatever their political views might be, as an organization of the greatest value to the country.

I arrived in Winnipeg on the 20th, and spent the afternoon in the Department of Agriculture with Mr. McKellar examining weeds which had been sent in for identification. The following morning, Mr. McKellar kindly drove me down the Red River to Kildonan and Middlechurch, where the Indian Industrial School is situated. Here we crossed the river and returned to Winnipeg by the opposite

bank. The whole of this country was found to be badly infested with weeds of many kinds, the Canada thistle, wild mustard and tall rag-weed being particularly conspicuous on most of the land passed. However, just before reaching the city again, some market gardens were seen in an excellent condition of cleanness, showing what good results could be obtained with hard work and attention.

On the morning of the 22nd, I left Winnipeg for Cartwright in Southern Manitoba in company with the Rev. W. A. Burman and Mr. P. V. Collins, of Minneapolis, the editor of the "North-west Agriculturist" of that city. Both of these gentlemen are keenly interested in the question of noxious weeds, and together we made many useful notes on the occurrence of the species observed. Cartwright was reached the same evening, and Mr. Burman and I drove out to the Hermitage, the residence of Mr. E. Firmstone Heath, about 6 miles to the north of Cartwright. Of the observations made at this point, the most important was the detecting of the Perennial Sow thistle, close to the railway track at Cartwright. Before leaving I drew the attention of some of the leading people to this weed, and advised them to lose no time in eradicating the whole patch. We returned to Winnipeg on the evening of the 23rd, and left for home the following morning.

I have the honour to be, sir,
Your obedient servant,

JAMES FLETCHER.

The Honourable
The Minister of Agriculture,
Ottawa.

