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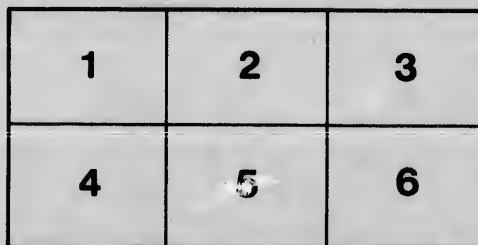
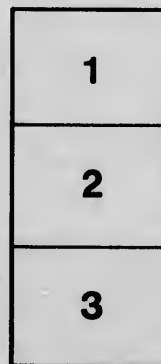
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HOP GROWING ON VANCOUVER ISLAND,  
BY CHARLES ST. BARBE

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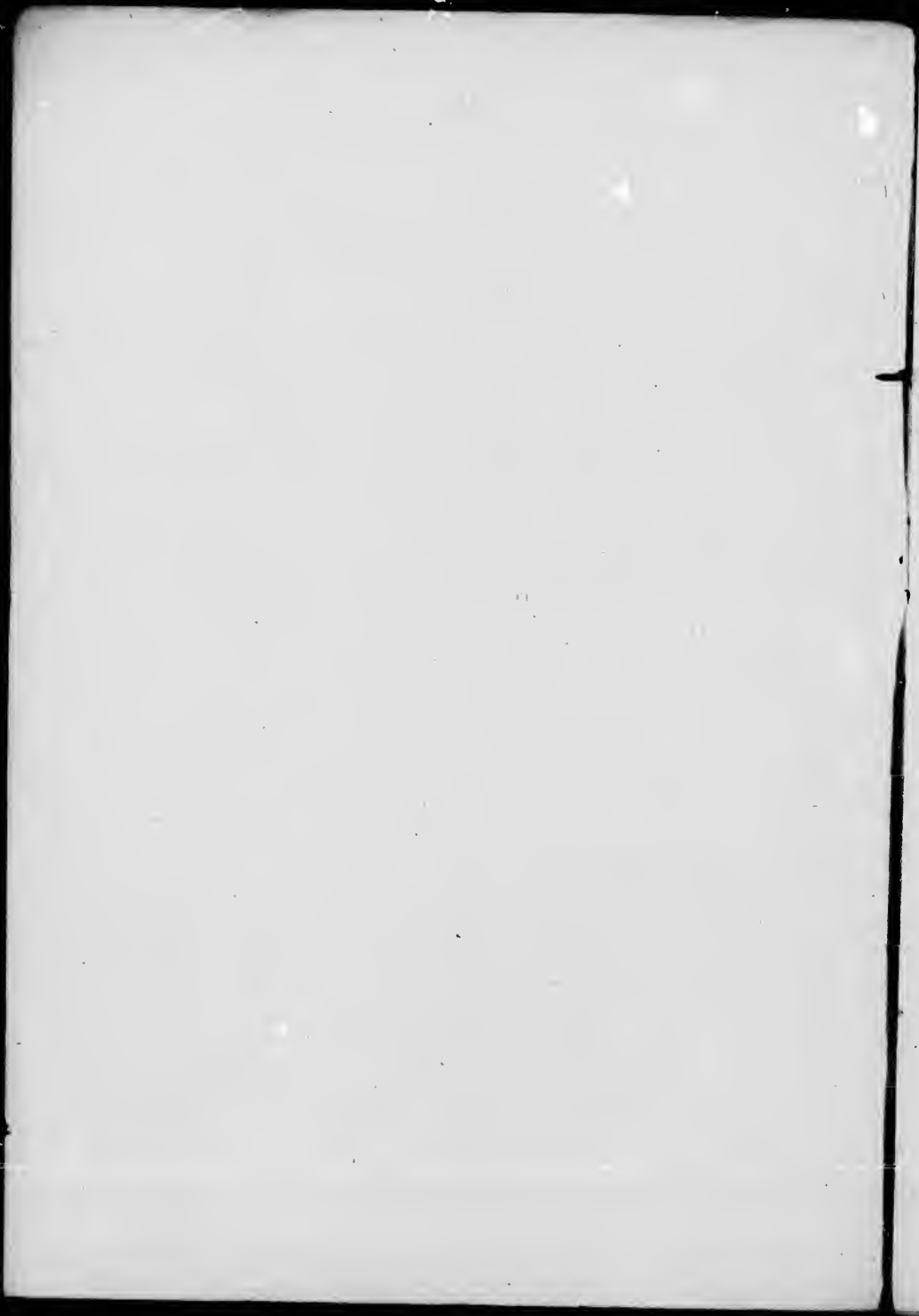
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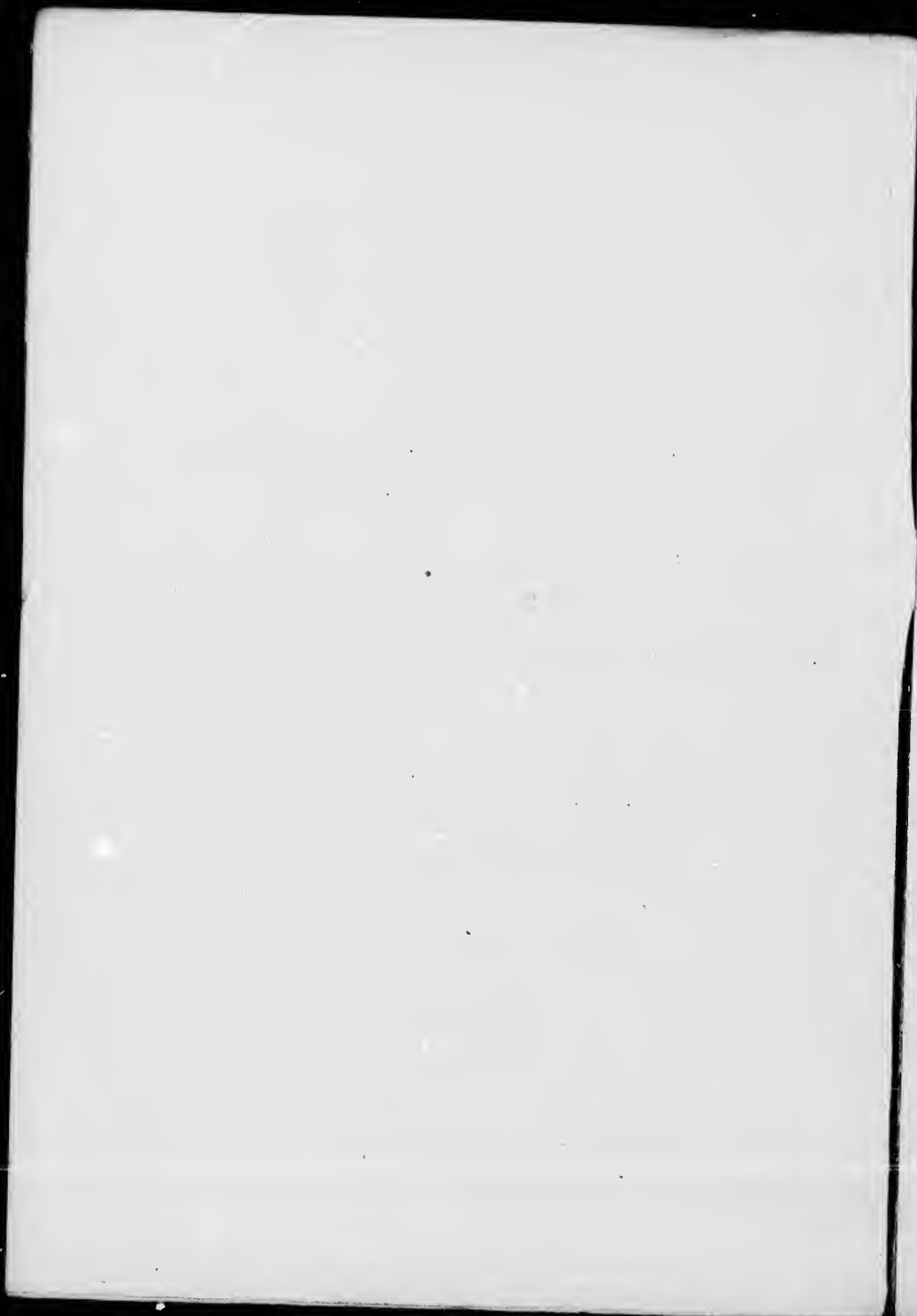
SIR,—I have the honour to transmit herewith, for your approval, the first Bulletin of the Department of Agriculture of British Columbia on the culture of hops, prepared by Charles St. Barbe, Esquire, of North Saanich.

J. R. ANDERSON,

*Statistician.*

*The Honourable J. H. Turner,*

*Minister of Agriculture.*



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## HOP GROWING ON VANCOUVER ISLAND.

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### The Establishment of a Garden.

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**T**HERE is a growing tendency at the present day among farmers, and especially among those immigrants possessed of a little capital, who come to the Colonies to find a use for that capital which will bring in a more bountiful return than the more antiquated methods of the Old Country, to plant crops which, by great care and skill, can be made to extract from a few acres almost as great a profit as ten times their number will produce under the ordinary rotation of grass, cereals, and roots. Of such nature are hops, and it is the object of this paper to show how they may be beneficially cultivated in the neighbourhood of Victoria. In a short sentence this may be summed up by saying that the great natural fertility of the soil, combined with other features which will be mentioned, go far to compensate for the cost at which the produce can be conveyed to the markets of London. At present there is a small local demand, but the neighbouring Pacific States of Oregon, Washington, and California have so immensely outgrown their own local requirements in the production of hops that it is not necessary to think of any market but that of England. This paper is not intended to be a full treatise on hop culture, but is merely a description of what is necessary to be done in order to establish a garden. Some English readers will perhaps excuse the mention of the fact that a dollar is practically four shillings—five go to the pound sterling.

#### Land.

Hops have been cultivated at Saanich, some eighteen miles from Victoria, successfully for a number of years, and from the samples that have been turned out, there is no doubt that hops equal to, if not surpassing, the best "Pacifics" can be and are grown in this district. Long before the Canadian Pacific Railway connected British Columbia with the rest of the world, hops were grown at Saanich, but either from the extreme sobriety of the people

of Victoria (then the only market), or from their insatiable desire for more ardent potatoes than are afforded by John Barleycorn and the golden hop, the growers were unable to sell their hops, and many gardens went out of cultivation. Of those few that are left, the owners do not seem to have reaped the benefit they should have done, and this may be accounted for by their delay in acquiring modern improvements in machinery and implements necessary to ensure the best kind of success, and by their failing to avail themselves of the best markets. At present it is not easy to acquire suitable cleared land in Saanich in small quantities, twenty-five to fifty acres being ample for a hop grower of moderate capital. Most of the farms are about three hundred acres in extent, and contain much bush and often useless land. Suitable land can, however, be now and then obtained, and with the growth of the industry, and the increased demand for small lots, holders will probably see the advisability of cutting up their property. As regards the price, cleared land can now be obtained at from \$100 to \$150 per acre. In all probability, suitable land can be found at such places as Cowichan and Comox, where the price is much less. In fact there is every reason to believe that hops may be grown on any rich, well-drained bottom land in this Island.

### Soil and Aspect.

As pointed out in the concluding lines of the last paragraph, probably any rich soil here will grow hops. It should, however, be absolutely clear of weeds, rocks, and roots, so that there may be nothing to interfere with its complete cultivation. A soil which experience has shown to be excellent is a fine, friable, aluminous loam, of an average depth of twenty-two inches, lying on a bed of stiff, yellow clay, and with a gentle slope towards the north. It is absolutely necessary either that the soil drains itself quickly or that it lies in such manner that any water it may retain can be easily drawn off by drainage. The authorities differ on the question of aspect, but the south-east is generally admitted to be the best. And there seems to be a sufficient reason for this from the fact that the morning sun brings more health and strength to plant life than the sun of any other time in the day. It may seem at first sight that as long as there are no trees or other obstructions to its rays, the sun will shine just as much upon one piece of land as upon another, but it is not so. It is difficult to explain the reason of this without a diagram, but it is as follows:—Take a board one foot square, and place it in such a position that its plane is at right angles to the

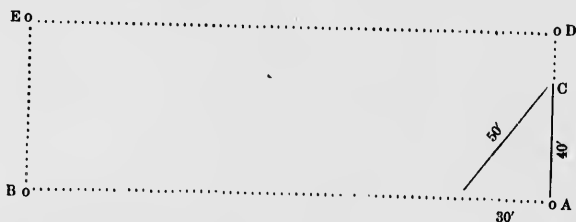
rays of the sun. It is now obvious that the board receives all the rays of the sun that there are in one square foot. Now incline the board backwards until it is at an angle of forty-five degrees with the rays and it will be seen that only half the rays that there are in one square foot fall upon the board. The more inclination given to the board the less amount of rays fall upon it, and if the motion is continued until the side of the board nearest the sun is elevated above the side furthest off, actually no *direct* rays of the sun will reach it, only *reflected* rays, and they are absolutely useless for hops. A considerable amount of water is used in spraying, and it is convenient to have the supply adjacent to the field. The garden should be rectangular, square if possible, and must be securely fenced.

### Planting.

As soon as possible in the autumn the land should be deeply ploughed, and harrowed several times in different directions, until the soil is brought into good tilth. Any weeds that may be torn out by this process should be raked into heaps and burnt, and if any rocks or large stones or roots are found they should be removed, as from this time forward all the operations of cultivation are necessarily hampered by the presence of the plants themselves. If the surface of the ground is very uneven it should be graded, that is to say, hillocks or hummocks should be removed and hollows filled up. The future cultivation of the garden can be carried on with much greater ease and success on an even surface than on a rough one, in fact some of the implements used, such as the spraying machine, cannot be worked on very rough ground. In all probability any piece of ground that may be selected will require to be drained, in fact it may be said that drainage in a greater or less degree is a necessity, and this work may now be carried out, but it is better to wait until the plants are in, for two reasons, first because it is better to plant the hops before the winter rains set in, and secondly because after they are in the drains themselves can be carried between the rows, which permits of any repairs that may be required in the future being effected without disturbing a root. It may be added that during the winter it is more easily seen where the drains are required. The method of draining will therefore be explained in its proper place.

Having finished the work of ploughing and harrowing, the next process is marking out the ground, and this requires to be done with great care, because it will be found much more easy to work the garden if the lines are absolutely true and straight. Nor can mistakes be rectified afterwards, for

a root once planted remains where it is practically for all time. There are gardens in England now that were planted more than 300 years ago. We will suppose that the field is rectangular, or nearly so, and that one at least of its sides is straight. The necessities for marking out are, first a piece of thin wire equal in length to the shortest side of the field, that is to say long enough to stretch across it, but if the field is say more than 150 yards in every direction, it would be better to mark it in two lengths. Anyhow, provide first a piece of wire of not less than 100 yards in length and attach a round piece of wood at each end for a handle. On the wire at distances of seven feet apart attach tags of string or rag, secured in their places by white lead. Secondly, provide short sticks about a foot long to the number of about 900 to the acre. These may be readily split out of any old pieces of rails or other cedar wood. Opposite one end of the longest straight fence and at 14 feet from it put a peg in the ground. This peg, which may be called A, should also be 14 feet from the fence at right angles to the first. Then at the other end of the longest fence put in another peg 14 feet from it, which may be called B. Now take one end of the wire and hold it at A and let the other end be held at B, or if it is not long enough to reach B, "range" the end in until it is in line with B and put in pegs at every 7 foot mark along between A and B. Then from A set off a right angle perpendicular to A B. This can be done by getting a piece of string 120 feet long and marking it at 30 and 80 feet. Hold both ends at A and lay the mark at 30 feet along the line already pegged out. Then holding the mark at 80 feet draw the loose part out until the other two sides are tight and put in a peg where the mark at 80 feet comes, and call it C. C A will then be at right angles to A.B., thus—



Now holding one end of the wire at A stretch it along A C so that its farther end, D, is in a line with C and put in pegs at every mark. Then take the wire and, holding one end at B, stretch it along at right angles to

B A and put in a peg at the end, E. Then stretch the wire between E and D and (beginning at D) put in pegs every 7 feet. It is now easy to stretch the wire across the field from the pegs in A B to the pegs in D E and peg off the enclosed ground. The process is easily repeated all over a very large field when once the first rectangle is correctly laid down. The lines of pegs will serve as guides. Fourteen feet at least must be left as a "headland" on every side of the field.

Hop cuttings can be obtained from Messrs. E. Meeker & Co., of Puyallup, Washington, at five dollars per thousand, which are quite as good as bedded sets. To the first cost must of course be added freight and duty. Two cuttings at least are put to every hill, so that not less than 1,800 or say 2,000 per acre must be got. Before planting, any long, straggling roots, and the ends of old bines, if there are any, must be cut off. Here it may be said that planting may be carried out in the spring if cuttings cannot be obtained in the autumn. Two men can plant from 1,000 to 1,500 hills per day, according to the condition of the ground. One man carries a spade, and at every peg makes out a square "spit" about six or eight inches deep, and loosens the soil at the bottom; the other man, with the cuttings in a basket, carefully plants two (or three, if they are not large) with their heads inclining towards each other, and replaces the peg a few inches from the plants, always on the same side of them, as a guide when poling. Nothing more is now to be done to the plants until the young bines appear in the spring, and in the meantime the farmer's attention must be turned to draining.

### Draining.

It is almost impossible in a short paper to explain a system of drainage that may suit all lands, but the first thing to do is to make a drain along the highest side of the land to catch all water that may flow on to it from other higher places. A drain must also be constructed along the lowest side of the field to receive and carry off all the water from the other drains. This and the first should be connected by another drain running across the field in any natural hollow that there may be, or along one side. This set of three drains may be called "main" drains. Into them are led other drains, cut across the general slope, and at sufficient angle to ensure a fall. The number and distance apart of these subsidiary drains depend entirely upon local necessities, but their effect will be seen almost as soon as they are cut, and their number can then be determined. Remember a drain receives the

water from the up-hill side, and prevents it soaking into the ground below it, where its effect may be looked for. Probably, drains will require to be from fifty to one hundred feet apart, and any specially wet hollows may require several little branches to completely dry them. The drains should be of sufficient depth to reach the clay subsoil, and also to allow about a foot of soil above them; they should be about ten inches broad at the bottom. Earthenware pipes are of course the best, and where they are used much narrower drains may be cut to receive them; but they are costly, and efficient substitutes may be made of cedar slabs. A slab of about six inches broad by two inches thick is laid on its edge on one side of the drain, and another slab of the same thickness and about ten or twelve inches broad is laid against it, the water running in the triangular space below. Fir boughs, fern, or straw should be laid on them before replacing the earth. The main drains, which must be open or constructed in such manner that they will carry off a large amount of water, should be about six inches deeper than the others, so that their mouths may not be silted up. Drain cutting costs from one dollar to a dollar and seventy-five cents a chain (four rods), according to size and depth, and cedar slabs ten feet long could be got at ten dollars a thousand. If there is a saw-mill in the neighbourhood, the outside slabs of cedar logs could probably be had for nothing, but it is needless to say that these, being sap wood, will not last as long as those from the centre of the tree. If stones are very plentiful on the land, the drain may be filled with them to the depth of say one foot, making a "rubble drain," which will work excellently and last for ever.

### Poling.

The first year the plants will require short poles, about ten feet long, one to each hill. The second and subsequent years two poles to a hill will be wanted, of from fourteen to sixteen feet long. Cedar poles are the best, but are somewhat difficult to get, and fir are so numerous that it does not much matter if they do not last so long as cedar. Poles should be not *more* than three inches in diameter at the butts, and not *less* than one inch at the top. They must be pointed at the lower end. Their cost is from eight to ten dollars a thousand. There are several other methods of poling hop gardens, being arrangements of wires or string carried from post to post, and though they may have advantages they are mainly devices used in England to avoid the expense of poles, and they involve much extra labour, so that, taking everything into consideration, the old-fashioned system of poling is probably

the best, and is certainly the cheapest in this country. As soon as the young plants begin to shoot, the poles may be put in position, which is done by a "pitcher," a pointed piece of iron about three feet six inches in length, and with a cross handle of wood. With this instrument one man makes the holes in the exact place occupied by the pegs, which he pulls out, another man following and driving the poles firmly into the holes thus made. Great care must be taken to keep the poles true in line. It will be found that many of the plants refuse to climb the pole, and they must be tied with rushes or "bass," a process that has to be kept going in the garden for some time.

These are the operations required to establish a garden. Many works have been written on the subject, but for further information the reader may be referred to "The Journal of the Royal Agricultural Society of England," Third Series, Volume 4, Part II., No. 14, 30th June, 1893, published by John Murray, Albemarle Street, London. Price, three shillings and sixpence. And also to "Hop Culture in the United States," by E. Meeker, published by the author, Puyallup, Washington, U. S. A., price \$1.50.

The following figures may be found useful:—

#### Capital Outlay required for a Hop Garden of 10 Acres.

Land cleared and fenced and in good order for planting, 10 acres @ \$150 .....	\$1,500
Hop cuttings, 20,000 @ \$5 P M. ....	100
Planting same. ....	25
Cutting drains, say 40 chains @ \$1.25 .....	50
Cedar slabs for same .....	40
Poles, 9,000 short (for first year) @ \$8 P M. ....	72
" 18,000 long (for second year) @ \$10 P M. ....	180
*Ploughs, harrows, cultivators, &c. ....	150
Spraying machine and appliances. ....	200
*One pair horses. ....	350
Drying kiln. ....	1,000
	\$3,667

\*N.B.—If the garden formed part of a farm it would not be necessary to charge the full value of these items to it, as perhaps half the time they would be available for other work.

### Working Expenses.

On an average crop of 1,200 lbs. to the acre the annual expense, including everything, such as cultivation, depreciation of poles, picking, drying and baling may be estimated at 12 cents per lb., or in round figures \$150 an acre. If the owner had his own horses and put in his own work as well, a very large portion of this would not be incurred, but taking it as it stands it would represent \$1,500 on a garden of 10 acres.

### Profit.

Again, to take the average crop of 1,200 lbs. and an average price of 25 cents per lb., we get \$300 per acre—\$3,000 for our 10 acres—leaving a net profit of \$1,500, which represents interest at about 42½ per cent. on the capital outlay. It may be added that this estimate of weight per acre, and also of the price, have often been greatly exceeded, and it is certain that with constant attention and careful cultivation a very heavy crop of hops of a quality that would rank higher than those grown in Washington State can be raised in the District of Saanich, in the Island of Vancouver.

CHARLES Sr. BARBE.

*September, 1893.*

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