1883.

VICTORIA.

REPORTS OF RESULTS OF IRRIGATION.

RETURN to an Order of the *Legislative Assembly*,
Dated 28th November 1882, *for*—

REPORTS from the Crown Lands Bailiffs or other Officers on the Means, Extent, and Results of Irrigation on the following Properties:—Adelaide Vale, Campaspe, Mr. O'Keefe; Perricoota, Messrs. Robertson; Torumbarry, Mr. Chrystal; Gunbower, Mr. Booth; Cohuna, Mr. Garden; Kerang, Mr. Patchell; Swan Hill, Mr. Officer; Epsom, Mr. Delbridge; Portland, Mr. Smith; and Lara, Geelong, Mr. Fairbairn.

(*Mr. McColl.*)

Ordered by the Legislative Assembly *to be printed*, 11*th April* 1883.

COPY OF LETTER FORWARDED TO THE UNDERMENTIONED OWNERS OF PROPERTIES SPECIFIED IN MR. McCOLL'S MOTION.

Department of Lands and Survey, Victoria,
Melbourne, 12th December 1882.

SIR (or GENTLEMEN),

I have the honor to request, by direction of the Honorable the Minister of Lands, that you will kindly favor him, at your early convenience, with information as to the means, extent, and results of irrigation on the

The particulars requested are desired to enable Mr. Madden to present to the Legislative Assembly Reports on the subject, in pursuance of a Resolution thereof on the 28th ultimo.

I have the honor to be,
Sir (or Gentlemen),
Your most obedient servant,

A. MORRAH,
Secretary for Lands.

Messrs. Robertson and Wagner, Melbourne Club.
D. Chrystal, Esq., Turrumberry, Echuca.
Salathiel Booth, Esq., Gunbower, Echuca.
J. Garden, Esq., J.P., Cohuna.
W. J. W. Patchell, Esq., J.P., Kerang.
S. H. Officer, Esq., Swan Hill.
Fredk. Delbridge, Esq., Huntly road, Epsom.
— Smith, Esq., Strawberry gardens, Portland.
Geo. Fairbairn, Esq., Woodlands, Lara.
A. O'Keefe, Esq., J.P., Adelaide Vale, Barnedown, Campaspe.

REPLIES RECEIVED TO FOREGOING LETTERS.

SIR,

Melbourne, 16th December 1882.

I have the honor to acknowledge the receipt of your letter asking for information as to the irrigation works commenced by me on the Turrumberry estate, and I have much pleasure in forwarding the enclosed, regretting only that your letter only reached me after my leaving Turrumberry for Queensland, so that I am compelled to furnish you with my information wholly from memory.

The irrigation works undertaken by me are situated on the Murray, at a point of the river about eight miles west of Echuca, and known as Dead Horse Point. The land to be irrigated consists of about 1,000 acres of red clayey soil, with small patches of black soil in the low-lying parts; fairly level, with a steady fall in the direction of the course of the river. The country has been hitherto very lightly grassed, and full of bare patches, caused by over-stocking and the continued bad seasons. In fact, during nearly all last season, this land had not a blade of feed of any kind on it, and with nearly 5,000 acres of rented and freehold land, my stock had all to be removed. The place would not carry 500 sheep; in fact, the place was a desert.

[*Approximate Cost of Return.*—Preparation, £1 0s. 0d.; Printing (860 copies), £3 15s. 0d.; Total, £4 15s. 0d.]

C.—No. 1.

Impressed with the value of irrigation, I, some years ago, made up my mind to try irrigation; but, as you are aware, I was unable to purchase the land on which the experiment was to be tried till May last, and therefore could do nothing, although I had all the machinery on the ground.

The plant at present employed is a 20 horse-power horizontal engine, and a 10-inch centrifugal pump; but when the river is higher I propose working a much larger pump. The cost of machinery and pump I put down at about £600; fluming, about 1,100 feet, to carry the water to the highest levels, about 6s. per foot; surface drains, about 2 miles at present constructed, costing 7d. per yard, that cost covering the cutting of the earth and forming of drains.

The cost of working the engine and pumps I cannot at present give, but a rough estimate would be about £10 per week, that cost covering wages:—2 engine-drivers, 2 men at drains, cook, rations, firewood, &c.

The portion at present watered is about 500 acres, and this is all I propose undertaking this year. Where the water has been applied the grass has grown splendidly, and I have no doubt of the good effects of this work; but from the great height the water has to be lifted from the Murray, say from 30 feet to 35 feet, I fear the expense will be heavy, and will, in my opinion, militate against farmers and men of small means going into irrigation to any extent, unless they are situated, as is Mr. Garden, on low-lying lands, with a plentiful supply of water near, that can be raised at a small cost. My intention in regard to my land is to cultivate it for a year or two, sowing it down at first in wheat, and then sowing with lucerne for grazing purposes.

In conclusion, I may say that I do not consider that irrigation from the Murray can be done at a less cost than £1 per acre, and then only where the land is comparatively level and suitable for the work. Regretting that this has to be written so hurriedly,

I am,
Yours obediently,

The Hon. the Minister for Lands, Melbourne. DAVID CHRYSTAL.

Sir, Perricoota, near Moama, 21st December 1882.

In reply to your letter of the 12th instant, requesting information as to the means, extent, and results of irrigation on our property at Perricoota, for the Honorable the Minister of Lands, we beg to say that the experiment we have tried, so far, has been of so limited and primitive a nature as to be hardly worth reporting upon.

The plant was originally erected for the purposes of sheep washing, and not for irrigation. This season, however, we experimented on a small area of about 15 acres stiff clay soil, sown with wheat and prairie grass; but the ploughing of the land was not finished until the end of June, and the sowing being so late, and the weather so very dry, there was little or no hope of these crops being successful. Indeed there would not have been half a ton of hay from the whole area had it not been watered. The land was flooded twice—once in October, and again in November. Prior to cutting of the crop the effect of these two floodings was magical. The yield averaged about a ton and one-half (30 cwt.) per acre of hay, a result we consider, under the circumstances, very satisfactory.

Next year we propose placing 200 acres under wheat in the same locality, having abandoned all other cultivation for that where irrigation can be successfully employed.

Beyond a slight test, we have not tried irrigating the natural grasses, but we think no other grasses will be successful, except in good rich soil.

We have the honor to be, Sir,
Your most obedient servants,

The Secretary for Lands, Melbourne. ROBERTSON AND WAGNER.

Sir, Murray Downs, 23rd December 1882.

I have the honor to acknowledge the receipt of your letter of 12th instant, asking me to furnish you with a report of our irrigation system and its results.

In reply, I beg to apologise for not having answered your letter before; but, in consequence of the New South Wales elections, I have been absent from home, and did not receive it until the 18th instant, and since then have been indisposed with an attack of swamp fever. As soon as I am able I will endeavor to comply with your request.

I have the honor to be, Sir,
Your obedient servant,

The Secretary for Lands, Melbourne. S. H. OFFICER.

Sir, Windermere, Lara, 26th December 1882.

I have the honor to acknowledge the receipt of your letter of the 12th instant, requesting information for Mr. Madden, the Minister of Lands, regarding the means, extent, and results of irrigation on my property here.

In reply, I have to state that my experience of irrigation is only on a very small scale, but showing results of a very encouraging nature.

My water supply is obtained from a dam across a blind creek, covering at present about 60 acres, being about 250 yards wide by 1,200 yards long. When full, it is nearly a mile long; but as the creek does not run every year the supply is only very small for irrigation purposes, the shrinkage from evaporation being one foot per month for quite six months every year.

During the last six years I have irrigated thoroughly a garden, and an acre of lucerne, which is cut six times every summer, yielding sufficient to keep three cows in full milk. I estimate each cutting equal to 1½ ton of hay. This is sown in rows one foot apart, and is slightly stirred with a pronged fork once a year at the beginning of spring, and at the same time a small quantity of stable manure (about a couple of loads) is put on. It is generally cut the first time in October, and the last in April. The water is turned over the lucerne every time it is cut, the ground never allowed to dry. I think from two to three inches of water is used each time, say 15 inches in a season.

The garden is kept constantly soaked all through the summer, and the growth of fruit trees and vegetables very luxuriant. The quality of the fruit is also fine, which I think may partly be owing to a mixture of lime in the soil here. A windmill alone was used for raising the water.

About eighteen months ago I put up a fixed steam engine of 5 horse-power, with the intention of irrigating a crop for hay, the annual rainfall in this district being far too little on such dry limy ground to ensure anything like a crop more than once in three years. Twenty acres of land were ploughed and sown altogether; but as it was nearly the middle of October of this year before I was prepared to use the water for this purpose, the season, which up to that time was intensely dry, was too far advanced to admit of the whole of the twenty acres being irrigated beneficially. I therefore determined to limit the operation to one-third of the crop, and leave the remainder to its fate. The irrigated part got two good soakings within ten days of each other. Soon after the second watering the rain came, and was sufficient to ensure a good crop without any more pumping. Before the rain fell, however, the effect produced by the irrigation was wonderful. In three days the color of the crop changed from a reddish-brown to a rich dark-green, and it was quite evident that a third application of water would have ensured a good crop without rain.

The difference between the portion which was irrigated and that which was not almost exceeds belief. There will be nearly two tons per acre of hay from the former, while from the whole of the latter there has been gathered only about three loads of rubbish, and thrown to the fowls. To a farmer it is just the difference between a beautiful and profitable crop and nothing. Both these crops had, of course, the same fall of rain, but the artificial watering ***at the right time*** made all the difference.

Where, as with me, the supply of water is limited, and has to be raised artificially, the method of distribution becomes important. I use perforated canvas hose, 3½ inches in diameter, the perforations about 3 feet apart, but diminishing as they recede from the end where the water enters, so as to equalize, as nearly as possible, the quantity of water delivered along the whole length of the hose. The length of perforated hose used is 60 yards, which gives a sufficient soaking to six or seven yards in breadth over the crop in about half an hour. A second length of perforated hose is laid six or seven yards behind the first, ready for use when the first has thrown enough water. This saves time, and also saves moving the ***hose which is full of water,*** the connecting hose ***merely*** being shifted from the first perforation, which is full, to the second, which is empty. The first is then allowed to run empty, and so is easily moved back.

When both windmill and steam engine are working, the quantity of water raised is about from 8,000 to 10,000 gallons an hour, the height being from ten to fifteen feet. The canvas hose I imported from England at a cost of 1s. 9d. per yard, the price in Melbourne for a smaller size being 4s. 6d. per yard. If I had been ready to begin irrigating about the 1st of September, instead of the middle of October, I could easily have watered the whole of the 20 acres.

I hope I have made myself intelligible. Should any explanation be required, I will be happy to give it.

I have the honor to be, Sir,
Your most obedient servant,

The Secretary for Lands, Melbourne. GEO. FAIRBAIRN.

SIR, Portland, 8th January 1883.

I beg to acknowledge the receipt of your letter of the 12th December 1882, referring to the means, extent, and results of irrigation on my property in Portland.

Means.—By boring with common boring rods until I reach the limestone, which I find in my garden at from 25 feet to 35 feet from the surface, and immediately I touch the limestone the water comes up the bore. Therefore I put down the bore a 2-inch gas pipe to the limestone, and then I tamp round the pipe at the surface with clay and bagging, so as to stop the water coming up the side of the pipe.

Extent.—The extent of my garden is 3½ acres.

Results.—I can keep everything green in my garden all the summer. Respecting strawberries, on which I depend the most, I can grow one-third more by irrigation.

Yours truly,

The Hon. the Minister of Lands. THOMAS SMITH.

SIR, Gunbower, 16th January 1883.

In reference to your communication of 12th December 1882, asking that the Minister of Lands be informed as to the means, extent, and results of irrigation on the Gunbower property, I have the honor to report:—

1st. As to the means.—In the early part of 1882 I purchased a plant, consisting of two 10-inch centrifugal pumps and one 8 horse-power portable engine.

2nd. Extent.—I commenced pumping operations on the 8th August, on a 70-acre paddock of wheat. By continual pumping, day and night, I succeeded in flooding it all over by the fourth day. I may state this crop was nearly dead when the water was put on, but recovered in a wonderful manner. It was all cut for hay, and I consider went from one to three tons per acre. Without irrigating, it would not have been worth cutting. I then started to flood the grass lands with good results, the pasture flooded remaining green long after all the other grass was withered. I have constructed over eight miles of surface drains, at a cost of about £1,000, varying in height from 2 feet to 4 feet 6 inches.

I have had to discontinue pumping since the 18th November in consequence of there being no water, and through that have had to discharge a large number of men. There has not been any water flowing down this portion of the Gunbower for the last three years, through the erection of weir A, pointed out in "Gordon and Black's scheme," which completely cuts us off, as well as a large number of residents in the district.

According to "Gordon and Black's Report," this portion of the Gunbower Creek, commencing at weir A and extending to Deep Creek, has been overlooked, so that for nine months in the year, as far as irrigation is concerned, we are completely at a standstill.

In conclusion, I consider irrigation will pay well if water is brought within a reasonable distance of the different holdings, although I am not in favor of an elaborate or costly scheme.

I have the honor to be,
Yours truly,

Secretary for Lands. SALATHIEL BOOTH.

REPORT OF MR. CHARLES TATTAM, BAILIFF OF CROWN LANDS.

SIR, Echuca, 28th September 1882.

In compliance with Mr. Levey's memo. of the 27/9/82, I have the honor to report that I was in the parishes of Gunbower and Cohuna on the 11th, 12th, 13th, 14th, and 15th of September. The crops, as a rule, were looking well, especially the early sown ; some of the late crops looked bad.

The caterpillar had made its appearance in the parishes of Murrabit, Kerang, Cohuna, and Gunbower, and had made great havoc. In several places the crops were self-sown. Last year a hurricane passed over this part just as the crops were fit for cutting ; not one bag was harvested ; this fact accounts for the self-sown.

As regards the grass lands, the long and excessive drought and the over-stocking has seriously checked the growth of the grass ; and unless we have heavy rains shortly, I fear it will be a bad season. The hot weather we had last week has seriously checked the growth of the crops—grass and vegetation.

The tanks and dams that have a good catch are full, but a great number have very little water in them.

The Murray River, the Goulburn, the Loddon, the Gunbower and Barr Creeks, have been very high, and a large body of water has run through them. The smaller creeks, such as Bullock, Picaninny, Taylor's, and the Pyramid are not very high.

The Swan Hill Shire deepened the Gunbower Creek at its mouth on the Murray River, and also Taylor's Creek, Gunbower township, with a view to fill the Kow Swamp. Expectations have not been realized ; the water runs very slow into the swamp, and a very small body of it.

As regards irrigation, the plan adopted by Mr. Booth, carried out by his manager, Mr. Leitch, is as follows :—Drains have been cut around the paddocks about 10 feet to 12 feet at top, and probably 3 feet deep. On the bank of the Gunbower Creek, adjoining the Gunbower township, an engine has been erected, with two centrifugal pumps, which lift an immense body of water about twelve feet high into a logged tank or reservoir, from which it runs through the drains above mentioned, and is then distributed over the land. I was examining these works on the 15th September 1882 ; they were not working at the time, but active operations were going on to complete the works. It is intended by Mr. Booth to irrigate his home station paddocks for grass. As far as I could judge, it appeared to me to be a success, as far as they had gone. I did not see these two centrifugal pumps working.

On 14/9/82 I was at Mr. John Garden's, Cohuna. He had commenced operations in irrigating his land, and was without doubt thoroughly successful. This land is on the Barr Creek, adjoining Mr. Andrew Kirwan's. The shire has made a weir over the creek, which dams back the water. At that date the creek was very high, and running fast. Close to this spot, Mr. Garden has placed his engine and centrifugal pump. He has an unlimited supply of water. In the first place he had the levels taken by an authorized surveyor, Mr. Breen. He then had the drains or dykes (about 3½ miles of main drains or dykes) made all around the paddock, about 10 feet or 12 feet wide at top, and about 3 feet 6 inches deep. From these drains or dykes he had sluice-heads or outlets for the water on to the crop, and then on the crop he had plough furrows in all directions. The crop was covered with water several inches deep. He had been working four days, and had covered fully 150 acres with 6 inches of water. This was to my own knowledge an accomplished fact. He expected to irrigate 1,200 acres in fourteen days. This land is nearly level ; the highest part is about 8½ inches from the spot where the pump stands. The machinery consists of a new 10 horse-power engine by Rustin and Procter, and a centrifugal pump, 15 inches diameter, made on a new principle by Robison Brothers, Melbourne. Mr. Garden states this is the first of its kind. It lifts 5,000 gallons of water per minute ; I saw it working. The immense body of water it lifts is like a small cataract. This simple and efficient mode of pumping so large a body of water in so short a time, if properly used, will convert thousands of acres which are now comparatively unproductive into productive land, which will keep cattle and sheep fat at all times, and employ a large amount of labor. As Mr. Garden by his enterprise and perseverance has proved that irrigation can, in favored places, be carried out successfully with these wonderful pumps, it would be well-spent time if those who take an interest in these matters would inspect this pump at Mr. Garden's, and also the pump at Gunbower ; they would be well repaid for their trouble.

I have the honor to be, Sir,
Your obedient servant,

The Secretary for Lands, Melbourne. CHARLES TATTAM.

By Authority: JOHN FERRES, Government Printer, Melbourne.