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Major-General FREDERIC COTTON to Under Secretary of State for India.

Wrexham, North Wales,
11th November 1871.

Sir,

I beg to acknowledge the receipt of your letter (5309) forwarding two reports on the management of the Sydapett Farm, Madras, and to express my thanks for the opportunity afforded me of reading and remarking upon these interesting papers.

Though constantly reading papers on farming affairs from all parts of the world, I have rarely met with any of so great interest as Mr. Robertson's reports on the Madras Government Farms for the years 1869-70 and 1870-71.

Mr. Robertson has indeed turned to the best account the means placed at his disposal, and all that he is doing will not only be of extreme value in India, but of high interest to those engaged in farming everywhere.

No question arises that is not at once tested by experiment, and as each trial is kept distinctly to the one point under investigation, its results are clear and unquestionable, and, if they are not decisive, it is either because the experiments were of necessity made on too small a scale, or are such as require confirmation from repetition, which we may rest assured they will have.

In three years Mr. Robertson has not only brought his farm into order, but he has already shown what important results may be obtained from it, small as it is.

By proving the practicability of raising green crops at all seasons of the year, by the introduction of some new plants well suited to that purpose, and by showing clearly the profit to be derived from them, a most important service has been rendered to the country.

His practice of economizing cattle manure, and his successes with mineral manures, are of incalculable value, and will eventually lead to the restoration of that vast area of land in India which exhaustive cropping has reduced to a minimum of fertility.

The trials, which seem to have established the fact that it is only necessary to steep the gram, which hitherto has always been boiled, and is the food of every horse in the south of India, ought to lead at once to the economy of a great amount of fuel, as well as a saving of a very considerable portion of the nutriment in the food. It is extraordinary that this should have escaped detection before, as the other pulse used (Benga gram) has always been steeped only. This point is of so much importance to the Cavalry that it will, of course, be thoroughly tested on a large scale. One important result of this change would be the saving of a great deal of good manure, which is now burnt to aid in the boiling of the gram.

The introduction of a new breed of sheep will be, no doubt, a success, as with sheep it does not require many generations to establish a new type. This will be a great advantage in the Carnatic, where both mutton and wool are of an inferior quality. And although it is not probable that there will ever be a heavy fleece on any sheep where there is no winter, still the wool may be found to have some useful quality. And I would recommend that, however coarse it may seem, it should be sent from time to time, as it changes its character, to England, for examination, as no one but the manufacturer can determine the value of any material, or can point out what change would improve it.

Indeed, in all efforts to effect a change in both animal and vegetable products, the guidance of the consumer should be constantly sought for, as it has frequently been found that the production of a finer appearance has been gained by the sacrifice of some useful quality. Fortunately, in Dr. Forbes Watson, the Government has an able and energetic man, always ready to communicate with the manufacturers, and interest them in a new introduction, so there need be no difficulty now in obtaining their advice.

Mr. Robertson's remarks upon the effects of good and deep cultivation are of great interest, and he is right in pointing out the advisability of manuring, not

the surface only, but the whole of the soil stirred by the plough. Indeed, he might have gone further, and said that the best position for the chief part of the manure is as far below the surface as the roots can reach, for where the soil is richest, there the roots will be most abundant.

Manure near the surface is not only wasted by its volatile ingredient being carried off, but its effect on the crops is insecure, where they can only be saved from withering by a constant succession of rainfalls. In the reports under review, it has been shown that there may have been an abundant, even an excessive, fall of rain, and yet the crops lost by drought. No plant can exist long in its growing season without moisture at its roots, and as the soil dries from the surface downwards, the number of days or weeks, or months a crop can live without rain depends on the depth at which it has its roots.

Even in the tropics the soil does not dry to a great extent very rapidly, so that each additional inch in the cultivation adds materially to the security of the harvest; and as that is the most important object that the Agricultural Department will have to work for, Mr. Robertson's experiments on deep cultivation are of extreme value.

It was with a view to the trial of deep cultivation over large areas that the steam plough was sent out, and either by its means, or by some common subsoil plough, I hope its good effect may yet be shown on a scale that shall leave no doubt of its efficacy to reduce materially the risk of scarcity and famine; and as in land under ordinary good tillage the yield is almost in proportion to the depth of cultivation, and an acre ploughed to a double depth will save the farmer nearly a whole acre's rent, the profit will be so immediate, that even the poorest ryot may afford to purchase this better security without reducing the acreage of his farm.

Interesting as all Mr. Robertson's experiments are, I will not be tempted to comment upon them further. If my observations can be of any value, it will be by pointing out what I consider the deficiencies of the farm, and the means I would adopt to supply them.

I must, however, while congratulating the Government on the present hopeful state of agricultural affairs in Madras, remind those writers on the subject who are inclined to underrate every effort made before the appointment of Mr. Robertson, that the most important step was taken by Sir William Denison when he established the farm; and, judging from the pace at which agricultural improvements move in England, the Government has gained as much advantage by the very small sum of money spent from first to last, as could under the circumstances be anticipated.

I have before warned the Government that, although the Sydapett Farm was doing such good service, it is not fit for its purpose either in area or position, and I must reiterate my advice that another site should at once be selected.

The extent of the farm is even now insufficient for the trial of the preliminary experiments in progress. Farming on the scale of gardening, however interesting and suggestive, is altogether delusive when made the basis from which to calculate farm profits.

No one with any experience in farming would be satisfied when told that a little plot of land had produced 60 lbs. of cotton, and therefore he might reckon on 1,000 lbs. on every acre. The weights and measures of arithmetic may be ever so carefully treated, but the multiplication of a slight error has too often led to disappointment for any practical farmer to consider a small experiment trustworthy.

The Government trials must be on a scale large enough to be conspicuous and convincing, and the list of subjects touched upon in their account of the infant farm at Sydapett, can hardly give the faintest idea of the multitude of questions that will have to be investigated.

The Farm Committee have declared, that the Sydapett soil is too light for it ever to become a good seed farm, which is rather a serious fault; and they give up all hope of breeding cattle from the want of suitable land for the purpose. In short it must be admitted, that there is not extent of land or variety of soil that fits it to become the central farm for the Presidency.

Nor is the want of space the only defect of the present site. The absence of a stream of water for irrigation is a still more radical fault, as it prohibits entirely the examination of the most important of all questions,—the value of water, and how it can best be economized.

I have seen lately, in the estimates for completing the great irrigation works, that every calculation is based on the supposition that rice, and rice only, is to be grown on all the land that can be watered. Is this advisable?

I have, in a former paper, pointed out that irrigated rice is only grown where land is taxed, and the water is given by Government in unlimited quantity. But where water is raised from wells, at the expense of the cultivator, it is rarely or never grown, other crops being cultivated which yield a better return for the cost of the water.

In India the water is the property of the Government, and on it depends not only the prosperity of the country, but the lives of its inhabitants, it behoves the Government therefore to guard it as its most precious treasure. It will no doubt be the first object of the new Agricultural Department to determine how this invaluable gift can be best economized, and to ascertain this, its actual value on every crop must be tested by experiment. In these all-important investigations, the Sydapett Farm, with its able Superintendent, can give no help whatever. Nor can the pupils educated there carry into the provinces any knowledge of the treatment of land under irrigation.

I cannot but think that the Government will agree with me as to the advisability of correcting this; and that permission will be given for a farm being begun where there will be land enough, and water enough, to make their experimental farm and place of agricultural tuition complete.

I am glad that His Grace the Secretary of State has given me an opportunity of calling attention to this subject now, while the Sydapett Farm is in a condition to be disposed of, without probably any loss to the Government. That it is in that condition is due to the good management of the Committee, and the rigid economy of their Superintendent, who, if I read the accounts rightly, has built a very considerable homestead and a residence for himself for less than 500*l.*, about one-seventh of the estimated cost of the smallest station, or shed, as it might have been, on the projected narrow gauge railway in the Valley of the Indus. I must be allowed to express a hope that this cheap engineering may not be lost sight of by the Agricultural Department,—a warning, as it appears, not unnecessary in the present day.

I have always considered the Sydapett Farm well placed in being near the seat of Government; and I would not that the farm I propose should be far from Madras.

In the Carnatic, it is true, it cannot have the advantage of the most certain irrigation, because that can only be had under the influence of one of the great rivers that rise in the Western Ghats, and receive their supply from the southwest monsoon.

The next source of supply within moderate distance of the Presidency will be found under a large tank supplied by the Palaur river; and Caverypauk, which is about 60 miles from Madras, is the finest of these works. If a channel could be led from this on a high level to command a strip of land on the edge of the present irrigation, it would have every advantage of position, being within moderate distance of the railway, and having any extent of dry land available for unirrigated cropping, or for cattle and sheep breeding.

If the farm were in such a position as this, the Superintendent would have so good an opportunity of gaining information as to the results of the Native mode of working the wet land, that he need not himself go largely into rice cultivation. And working with the ryots as his immediate neighbours, he would be able to give them advice; and there would be a far better chance of having his improvements in agriculture adopted than he could hope for in Sydapett.

Now that the Government has taken under its supervision the agriculture of the country, I hope an effort will be made to convince the Native cultivators that it will be well for them to break through their present system of doing everything in their own houses, and leave all that can be done better and more cheaply for them to those who make it a special business. It was with a view to this that many of the implements supplied at Sir William Denison's request were sent by me to Madras. If these could be brought into use, as it was my hope they would, for the benefit of a whole village, the ryots would all have the advantage of aid from machinery, although their capital was insufficient for the purchase of it.

I can remember when the travelling threshing machine, worked by cattle, first came into use in England, and the system has now been extended, till not only is all the threshing of the small farms done by itinerant machines, but the steam

plough, the cider-mill, the corn-d and other implements, are all to be hired when wanted.

As there has hitherto been no machinery sent out by me and of idle has always been attributed to which it was never supposed they could move in this matter, much of the seems to have been unused, and its lying poor ryots not being able to purchase it,

The Fa n Committee has had no power of doing anything in this matter, it was out of their province; but I hope something now may be done, and I would repeat a suggestion made when I first sent out the chaff-cutters, that one or more, with a horse or bullock gear to work them, should be set up at one of the halting places near Madras, where straw is purchased every night for some hundreds,—it may be thousands,—of bullocks; and it would be a great saving to the consumer if he could purchase it cut by the machine. I should imagine that some one could be found to undertake this, if the apparatus were given to him for the trial; and if he succeeded, the value of the machinery would be money well spent by the Government.

I have no knowledge of some of the machinery still in store, as it was not sent out by me; but I can hardly imagine any English agricultural apparatus not being applicable to some good purpose in India, where the rudest mills, worked by cattle, are employed to advantage.

And I strongly recommend, instead of abandoning it, that every effort be made to bring it into use in such a way that it could be employed on hire. As for the Government loss, if the implements were given to those who would make the first attempt to introduce the system, the whole sum spent from first to last is so small compared with the object to be gained, that it need not be taken into consideration.

Before closing my remarks, I would express a hope that this farm, transferred, as I propose, to a better site and developed to the utmost, may become a place of instruction for agricultural teachers of every class, and I would endorse the suggestion of Mr. William Robinson, in his admirable Minute on the agricultural scheme for the Madras Presidency, that agriculture should not only be taught on the Government farm, but that it should be recognized as a science worthy of a Professorship in the Madras University.

I have the honour to remain,

Sir,

Your obedient Servant,

FREDK. COTTON.

No 39 of 187

It seems to me
lying near the district
to be loan to the Chief.

Far - at a distance
of 60 miles, where
the Society would have
no society in history
to be determined to
medical aid - then
to the Chief.

to be determined to
medical aid - then
to the Chief.

He may ask
the Com. in Chief
to ask Thompson to
try taking from
instead of buying it.

The Chaff Cutter
have been tried at
the old Chaff. The
which in Madras. The

Answers.

(2)

As Gen. Cotton's remarks
on the Lydelpat Farm
reports. were extreme!
with the recent dispatch
forwarding them. I
now do. circulate the
dispatch with the
enclosure. in the
ship that the Members
of the Society wish to see
in Gen. Cotton's paper
to be specially noticed
as to the suggested
change of site -
- Experiment on Channel
in the river under the
bank.
- Trial of steeping instead
of boiling from in
country.
- Trial of Chaff. cutter

Dear Mr. Pitts.

L.R.

P. Jan. 72.

The despatch of
Colton's paper
of course to the
Ad. of Rec. I was po-
sition for their ob-
jections.

Genl. Colton when
he wrote was not
aware of our scheme
for District Farms. These
are the places where
the irrigation - experi-
ments be commenced
can be tried. I doubt
the probability of finding
a purchaser for the
Farms - which has
cost him some of
the 5000 Rs. now turned
by Genl. C. - Ad. of Rec.

Wd. sends with
this

L. O.

I would trust the
dispatch of Genl.
(this letter to the
Board & to the
Admission for this
purpose. In the
mean time I reserve
my opinion.

A. P.
L.R.

General Cotton's observations
- on Sydapet Farm
Reports for 1869/70 & 1870/71

Revenue
No. 39.

To His Excellency
in Council

Honourable The Governor
St. George.

My Lord,

Para. 1. I have in Council the Despatch from your
Excellency in Council, dated the 25th of July, with
which you forwarded the report on the Sydapet Farm for 1869-70 and
1870-71, together with your observations thereon.

Dated 11th
Nov. 1871.

2. I have thought it desirable to obtain the opinion of Major-General
F. C. Cotton on these reports. I transmit herewith 25 printed copies
of the observations which have been so obliging as to make upon
them.

3. You will observe that I concur with your Excellency in Council
as to the valuable character of Mr. Robertson's experiments, and the mode
in which he has recorded them. I agree in this view. The complete-
ness of the reports, the large and varied nature of the information col-
lected, and the practical manner in which they are detailed, are very
creditable to Mr. Robertson and cannot fail of being productive of
benefit to the country. I need with satisfaction that Native gentlemen
and zemindars are making use of the farm to have their servants taught
the use of improved implements, and that Mr. Robertson is stated to
possess the faculty of managing his Native labourers in a remarkable
degree.

4. You will observe that General Cotton points out that the larger
and more expensive implements of machinery and husbandry, which
were sent out at the request of your Excellency in Council, were sent
out to exemplify the advantages of division of labour, and the general
use and economy of efficient instruments when used in common, which
would be out of the reach of individuals.

5. His opinion also on the limited scope of the present farm from the
various disadvantages it labours under with respect to position, want of
natural streams, and poverty of soil, and the expediency of removing the
site to a more favourable spot for agricultural operations, will doubtless
be fully considered by you. Whether your Excellency in Council
agrees in this view or not I feel little doubt that, under the able
management of Mr. Robb, and with the interest taken in the
matter by your Government Mr. William Robinson, and the other
members of the Farm Committee, this experiment may exercise an im-
portant influence, by example as well as by direct instruction of the
Natives, on the agriculture of our Presidency.

I have the honour to be,

My Lord,

Your Majesty's most obedient humble Servant,

74981/24

Received
20th Decr 1871

Letter to Fort St George
No 39.

Received 14th Jan 1872.

Via

Brindisi & Bombay.

Enc. N. 6. 24.

551
#561.

Advised that the
despatch to the
enclosure be comm
to the H. of the. &
the H. of W. Robt.
for any remarks to
may wish to offer.

L. H.
5th Oct 1872

14. Bond Street, Deptford.

Des

Transmitting 25 Copies
of Major Genl. Cotton's observations
on Sydapet Farm Reports for 1869
& 1870-71.

14th Oct 1872
Capt. G. A. Turton

Exd. G. A. Turton.