

MADRAS RECORD OFFICE.

Government of Madras.

Revenue DEPARTMENT.

G.O. No. 12/0	<u>Press</u> <u>Mis.</u>
91-92	
Dated	3 — 6 — 18 6's.

Not to be folded or roughly handled

No. 91. Read the following letter from T. CLARKE, Esq., Member of the Board of Revenue, to J. D. SIM, Esq., Secretary to Government, Revenue Department, dated Madras, 10th April 1865.

SIR,

1. With reference to the Orders of Government contained in their Proceedings of the 6th July 1864, No. 1,168, I have the honor to submit a report on the Salt-Weighing Machines, which I found had been considerably altered and improved since I had last met the Mint Master at the Madras Kotar with the other Members of the Board of Revenue, to point out the defects which had been found to exist in the machines first issued from the Mint.

2. Colonel Carpendale has "removed the original beams and cast fresh ones. The beams are now made without a counterbalancing head, and the lever arm for the counterpoise weight is shorter with variable weights instead of a uniform one sliding on the beam in notches, and there are three knife-edges to determine the length of the arms, and two bars to hold the platform steady."

3. "The machines, in their new form, including japanning or painting, can be made for something less than Rupees 85. Re-modelling old machines and turning them out as good as new, will be Rupees 25 each or a little less."

4. "To cover the tare of the baskets Colonel Carpendale has ordered a 'rider' to be placed over the lever, which can be used far more conveniently than a number of weights for this purpose."

5. I found two of the improved machines at the Madras Kotar, and two at Homes' Gardens. One of the machines at each of these stores was not in perfect working order. Those in good order were in exact counterpoise when the maund weight was put on them.

6. On the day I visited the Madras Kotar, I had nine baskets, each containing a little more than half an Indian Maund of Salt, placed on the table of the machine. The whole quantity of Salt in the nine baskets weighed seven Indian Maunds. The first measurement was a unit of seven Indian Maunds. I afterwards changed the baskets; a slight difference was observable, the first time of 2 lbs., the second, of 3½ lbs. less than 7 Indian Maunds; being a difference of from 40 to 70 lbs. in the Garce, or from 4 to 7 per cent.

7. I then had six mercals brought, and the most skilful measurer was desired to fill the two Indian Maund scoop measures with each mercial; the result is given below. It will be seen that it took from seven mercals to seven mercals and two measures to fill the scoop, making a difference between the measurements with the six mercals of from ¾ lbs to 6 lbs., or from 22½ to 360 lbs. in the garce, or from 2 to 3 per cent.

EXPERIMENTS BY MEASUREMENTS.										EXPERIMENTS BY WEIGHMENT.				
Number of Mercal.	At 7 Mercals to 2 L. Mds. of Salt.	Quantity found by measurement.	Decrease.	Increase.	Conversion of columns 4 and 5 into lbs.	Difference per Garce.	Per-centage.	Number of Machine.	Quantity weighed.	Difference found by changing position of baskets.	Decrease.	Differ-ence per Garce.	Per-centage.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1	7	7	0	0	2	45	4							
2	7	6	66	0	11	213	2							
3	7	7	2	0	6	360	3							
4	7	7	0	1	3	22	2							
5	7	7	0	3	1	67	6							
6	7	7	0	0	...	...	...							

8. It is clear that if when every effort is made to secure favorable results, differences in measurement are so great, the difference when the efforts of the measurer are in an opposite direction must be excessive. The weighing machine are therefore more reliable and correct instruments for receiving and selling of Salt, than mercals in the hands of Native measurers.

9. At Homes' Gardens I followed much the same course as I had observed at the Madras Kotar. With Machine No. 65, I weighed six Indian Maunds. I then changed the baskets; there was a difference of 1 1/2 lbs., I then transferred the baskets to the other Machine No. 2, which was not quite in order; there was a difference of 3 lbs., and in altering the position of the baskets on this second machine, there was a difference of 2 1/2 lbs. between the first and second weighing. I then pursued the experiment with mercals; the results are given below. The difference ranged from 1 1/2 lbs. to 6 lbs. —

EXPERIMENTS BY MEASUREMENT.										EXPERIMENTS BY WEIGHMENT.					
Number of Mercal.	At 7 Mercals to 2 L. Mds. of Salt.	Quantity found by measurement.	Decrease.		Increase.	Conversion of columns 4 and 5 into lbs.	Difference per Garce.	Per-cent- age.	Number of Machine.	Quantity weighed.	Difference found by changing posi- tion of baskets.	Decrease.	Increase.	Differ- ence per Garce.	Per-cent- age.
1	2	3	4		5	6	7	8	9	10	11	12	13	14	15
1	7	7	0	0	...	...	...	0	65	6	...	...	...	...	...
2	7	6	0	0	...	6	360	3	2	5	80	3	...	37½	37
3	7	6	0	0	...	3	180	1.8	2	5	77½	0	...	60	6
3	7	6	1	0	...	2½	157½	1.5						52½	5
3	7	6	5	0	...	4½	247½	2.4							
4	7	6	2	0	...	2½	135	1.3							
5	7	6	7	4	...	1½	90	.89							

* This Salt was transferred to Machine No. 2.

10. It is clear, therefore, that as far as regards accuracy of weighing, we have by these improved machines attained as near perfection as it is possible to attain. There would not be a difference of 2 Mercals in a Garce of 424 Mercals in well made machines.

11. On the third day I proceeded to the Madras Kotar to ascertain whether Salt could be stored with greater celerity by weight than by measurement. On this occasion five of the improved machines belonging to the two Kotars of Madras and Homes' Gardens were present. Those which I had on my first visit found out of order had been repaired.

12. I first tested the five machines and found them to be in good working order. When a maund-weight was placed on each, it was in exact equipoise.

13. For each machine nine small baskets and nine men to carry them were employed; five men were employed in cutting the Salt, making in all fifty men. Each machine was set to weigh 6 Indian Maunds.

14. Thirty-six men were employed on another heap to measure the Salt. We commenced our operations of measuring and weighing at 35 minutes past 6 A.M. Ten Garce were measured out in 45 minutes, and weighed out in 55. We then substituted nine large baskets, each containing nearly an Indian Maund, for the nine small ones, and the machines were set at 8 Indian Maunds. Eight Garce and 87 Indian Maunds were measured out in 45 minutes, while 9 Garce and 13 Indian Maunds were weighed out in 1 hour and 12 minutes.

15. It is clear from this experiment that at present measuring is a rather more rapid and cheaper process than weighing. With 14 men less it took 10 minutes less to measure than to weigh 10 Garce.

16. Salt can also be weighed out more quickly with the small baskets holding little more than half an Indian Maund each, than with the large ones holding nearly a Maund each; I doubt not that after further experience greater expertness will be attained in weighing, and that the 10 Garce will be weighed with nine small baskets as quickly, if not more quickly than the same quantity can be measured.

17. In Madras the measuring is done with very great expertness and rapidity; but up-country the process is much slower, and I doubt not that weighing will be a quicker operation than measuring in the Provinces. But to weigh 10 Garce of Salt in an hour is not a bad result.

18. In a day of 10 hours with ten machines 24,000 Indian Maunds might be weighed, a larger quantity than is received into store at Madras in a day.

19. I consider the improved machines a success, and if taken care of as likely to answer admirably for our Salt operations.

20. These new machines are more complicated than the original ones, but they are easily taken to pieces and put together, and the principle of the machines and their structure are not at all intricate. They could be kept in order by a clever smith.

21. I think, too, it would be well if a clever mechanic or Smith were added to the establishment of each Salt Deputy Collector to repair the machines when needed. The machines when not in use should be kept under cover and should be taken care of.

22. I think if all the parts of the machine, except the knife edges and their sockets could be lacquered or painted, it would be an improvement.

23. After finishing my experiment to ascertain the relative rapidity of weighing and measuring, I had 6 Indian Maunds of Salt placed in nine small baskets, and

the whole weighed in a beam scale. These nine baskets were afterwards transferred to each of the five machines which had been used by me. The results are given below:—

No. of machine.	Quantity of Salt weighed.	No. of baskets employed.	Tare of basket on each machine.	Difference shewn by machines from beam scales.		Quantity found on measurement.			Equivalent of one Garce.		
				Decrease.	Increase.						
	I. Mds.		lbs.	lbs.	lbs.	Mer.	Mea.	O.	Mer.	Mea.	O.
No. 1	6	9	31½	...	...	21	6	4	436	2	0
" 2	6	9	27½	...	...						
" 4	6	9	30½	1	...						
" 5	6	9	27½	...	...						
" 84	6	9	27	...	2						

It will be seen that three out of the five machines gave the same result as the beam scales. In one machine the result was 1 lb. less; in another, 2 lbs. more than the beam scales gave.

No. 92. ORDER THEREON, 3rd June 1865, No. 12,10.

Separate Revenue, No. 9.
Salt.

The letter above recorded is Mr. Clarke's reply to paragraph 15 of the Order of Government, dated 6th July 1864, No. 1,168, in which he was requested to submit at the close of his tour a special report on the Weighing Machines lately introduced into the Salt Department.

2. These machines have recently been considerably altered by Colonel Carpendale, the Mint Master, and Mr. Clarke states that such of them as have been so improved and are in good order were in exact counterpoise when the Maund-weight was put on them.

3. After several experiments of both measuring and weighing, at the Madras and Homes' Gardens Kotars, Mr. Clarke is clearly of opinion that the weighing machines furnish the more reliable and correct check in receiving and selling Salt. The Government fully agree with him in this view, and the Board will adopt measures to have these improved machines introduced into all the Districts.

4. The success of these machines will greatly depend upon the condition in which they are kept. Mr. Clarke suggests, therefore, that a clever Mechanic or Smith be added to the Establishment of each Salt Deputy Collector to repair the machines when needed. The Government admit the necessity of employing such a servant, but they are not prepared to recommend a separate establishment after the recent revision of the Salt Department at a large increase in the expenditure. And they consider that the requirement of the case can be met by a saving to be effected in the provision for Measurers. One efficient Smith should be attached to each Salt District as inspector and repairer of the weighing machines, and should itinerate constantly through the Salt Stations under the orders of the Deputy Collector in charge of the Department. The Board of Revenue will be requested to report on this suggestion.

5. The Smiths in the Provinces are not likely to be able at once to repair these machines, and it occurs to the Government that the men might be trained

6 *Proceedings of the Madras Government, Revenue Department.*
3rd June 1865.

at the Madras Mint for the special work for some time, and sent to the Provinces as required. These men will be able afterwards to teach other Smiths in the Districts, and the training proposed need therefore be only a temporary arrangement. The Government will be prepared to sanction any moderate expenditure that may be necessary for paying small salaries to these Apprentices, on condition that they bind themselves to serve in the Salt Department for a certain number of years. The Board of Revenue will communicate with the Mint Master on this suggestion and submit their views on it.

6. The Board will at once attend to the suggestions made in paragraphs 21 and 22 of Mr. Clarke's letter, for keeping the machines under cover and for painting them.

(True Extract.)

(Signed) W. HUDLESTON,

Acting Secretary to Government.

To T. Clarke, Esq.
,, the Board of Revenue.
,, the Mint Master.

Exd. T. O'Connor.

Revenue Department.

No. 1210-

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 3rd ^{June} ~~May~~ 1865.

*Read the following
letter from T. Clarke
Esq., Member of the
Board of Revenue*

*Submitting a
report on the improved
Salt weighing Machines
received from the Mint* } *(Here enter 10 a p 10)*

*The letter above
recorded is Mr. Clarke's
reply to para 15 of
the order of Govern-
ment dated 6 July
1864, 81168 in which
he was requested to
submit at the close*

of

of his tour a special
report on the Weigh-
ing Machines lately
introduced into the
Salt Department.

2 These Machines
have recently
been considerably
altered by Colonel
Carpendale, the
Mint Master, and
Mr. Clarke states
that such of them
as have been so im-
proved, and are in
good order were in
exact counterpoise
when the standard
weight was put on
them.

After

3 After several
experiments of both
measuring and
weighing, at the Mad-
ras and Home's Gar-
dens Stores, Mr.
Clarke is clearly of
opinion that the
weighing machines
furnish ~~the~~ ^{more} reliable
and correct ^{check} ~~results~~
ⁱⁿ ~~weights~~ for receiving
and selling salt. The
Government fully
agree with him in
this view, and the
Board will adopt
measures to have
these improved ma-
chines introduced
into

into all the Districts.

4 The success of these machines will greatly depend upon the conditions in which they are kept. Mr. Clarke suggests, therefore, that a clever mechanic or smith be added to the establishment of each salt Deputy Collector to repair the machines when needed.

Although the Govt. admit fully the necessity of employing of such a servant they are not prepared to recommend a separate establishment after the recent revision of the Salt Department.

Richardson that Govt. make a list of the number of machines in each District.

I very much doubt whether it would be found that a native smith would be able to deal with these machines without throwing them out of adjustment.

Would it not be a proper plan to have a good smith attached to each salt District - let him go about through the salt plains, as a sort of inspector and repairer of the weighing machines? For a rough man of this class, then, when he work brought but if an experienced it were ascertained that a second smith was necessary, he could be instructed. Any smith sent on this duty would receive remuneration in the full measure of the work.

The above seems to me a good idea. The B. & C. might be asked to report upon it as well as upon

at a large increase in the expenditure. ^{And they consider} The last that the requirement of the plan will be to give the case can be met by a saving & a provision in the measure at each station. It is a smith to be on the efficient Smith & on charge of the machines. He is to be attached to each salt District to do the work of a competent repairer of a machine. A number of the weighing machines engaged on the special duty are to be kept in the salt District. The custody of the machines is to be in the hands of the salt District. The salt District is to be in charge of the machines. The Board of Revenue will be requested to report on this proposal.

5 The Smiths in the Provinces are not likely to be able at once to repair these machines.

machines and ^{the course in} ~~it~~ occurs to the ^{to be} ~~in the~~ ^{in the} ~~text~~ ^{of} ~~the~~ ^{the} ~~Government~~ ^{Government} that the

better plan will be
might be trained
to have men at the
Madras Mint for the
special work for some
time, and to send them
to the Provinces as per
quand. These men will
be able afterwards
to teach other Smiths ^{at}
the ~~Spot~~ ^{Districts} and the training
proposed need therefore
be only a temporary
arrangement. The Go-
vernment will be
prepared to sanction
any moderate expenditure
that may be necessary
for paying small sa-
laries to these apprentices,
on condition that they
bind themselves to serve
in the Salt Dept.
for

Under plan 5 - suggestion

for a certain number
of years. The Board
of Revenue will com-
municate with the
Mint Master on this
suggestion ~~proposed~~ and submit
their views on it.

6. The Board will
at once attend to the
suggestions made
in paras 21 and 22 of
Mr. Clarke's letter
for keeping the machines
under cover and for
painting them.

Mr. Clarke Esq. Secy. to Govt.
Bd. of Rev. &
Mint Master.

32

Revenue 1865 Sept.
Proc of Govt for June

No 1210.

Proc of the Madras Govt.
13 June 1865.

Pro. No. 100-101
6-7-1864

Proc of the Board of Rev 19 Sept 1865.
A 2679-

Proc of the Board of Revenue
28 March 1866 A 994-

M^r Clark's report
regarding the improvement
of the salt weighing-ma-
chines, Enimad.

No 91-92