M.R.O. 14—13,000—27-9-24.

MADRAS RECORD OFFICE.

Government of Madras.

Revenue **DEPARTMENT.**

G.O. No. 428 — Press Mis.

411 — 412

Dated 27 - 2 - 19 1863

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department, 27th February 1863.

No. 411. Read the following Proceedings of the Madras Government in the Public Department, dated 11th February 1863, No. 156 :—

Passing orders on a letter from Government Astronomer, making certain suggestion in regard to the Rain reports and other Meteorological records made throughout this Presidency. } (Vide Public Proceedings, 11th February 1863, Nos. 46, 47.)

No. 412. ORDER THEREON, 27th February 1863, No. 428.

1. Ordered to be communicated to the Board of Revenue with a request to instruct the Collectors to furnish the Government Astronomer regularly with the return of rain-fall in the form A, and to forward to that Officer at an early date copies of the registers of past years in the form B. The Board will supply to the Collectors, in communication with Mr. Pogson, the half pint graduated glasses proposed by him, and fix the principal stations at which the improved copper gauge should be adopted. Blank forms of the proposed returns will be transmitted to the Board's Office by the Superintendent of the Government Press.

2. The Board will submit a list of the stations in each District at which rain gauges are kept by Revenue Officers, and will state what means Collectors have of ensuring their being properly managed and the results accurately registered.

(Signed.) J. D. SIM,
Secretary to Government.

PUBLIC DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Read the following letter from N. R. POGSON, Esq., Government Astronomer; to A. J. ARBUTHNOT, Esq., Chief Secretary to Government, Fort Saint George, dated Observatory, 23rd December 1862.

I have the honor to address you in reference to the Minute of His Excellency the Governor in Council, dated July 1862, and the Order thereon, 28th July 1862, No. 889, respecting the Rain reports and other Meteorological records made throughout the Madras Presidency.

1. As suggested by Government in the abovenamed order, the various monthly rain reports have been duly supplied to me, in the usual form in which the District Collectors have hitherto been in the habit of submitting them to the Board of Revenue. My time and attention have however been so wholly absorbed by other more pressing duties, that it was impossible for me to give them the consideration the subject required until the present date. Still, from having carefully watched the reports through the past five months, I am now able to state the changes requisite to render them available for whatever inquiries demand an approximate knowledge of the rainfall throughout the Presidency.

District Rain Reports duly supplied to the Government Astronomer, since August 1862.

2. The present form in which the reports are submitted renders them utterly worthless, and I beg leave to suggest the adoption in future of the enclosed form A, as the first step towards transforming them from mere waste of public time and labor into valuable scientific data.

Present form of reports worthless, and new form (A) proposed.

3. As a simple statement of the current rainfall is valueless for present information, unless there exists also the means of comparison with an average of former years, I propose that all past registers from 1853 to 1862, inclusive, for each separate station, may be copied out and supplied to me in the enclosed form B, at the earliest convenience of the respective parties in charge. As speedily as time and opportunity permit, each individual report shall then be examined throughout; and wherever the general character and appearance warrant reliance upon the past measures, bi-monthly and annual means deduced, for present and future comparisons. I am well aware that this will entail no inconsiderable additional task upon me and my few trustworthy and capable Assistants, but it is the only plan by which Government can ever obtain any return for the past outlay of time incurred, and by which future reports can be rendered immediately useful. I therefore strongly urge its adoption forthwith. My own share of the task will be cheerfully rendered, but as there will certainly be no possibility of my accomplishing the whole of the reductions *myself*, and the ordinary duties of the Observatory are as much as any advisable number of permanent Assistants can well get through *in their office hours*, and far more than my present inadequate staff can ever be made to carry out, I should recommend that such reductions should be entrusted only to the best Assistants here, who may be willing to work in overtime, and that a small payment for the complete reduction of the records of each separate rain station should be granted, in all cases in which, after a sufficient inspection, I am able to certify that the computations have been correctly and properly executed.

Complete copies of all past daily records requested in order to deduce averages.

4. As regards the actual truth of the results to be drawn from the numerous reports thus collected, it would be equally dangerous to anticipate too much, and unjust to estimate them too lightly. In all probability some of the registers may merit only summary rejection, as utterly worthless and unreliable. In such instances, the sooner rain measurements are discontinued the better. In others, however, and I would especially distinguish the excellent reports furnished from the Nellore District, the reverse will be the case: while should only a fourth of the whole number prove really worthy of the careful reduction proposed, much will be gained, by realizing, at a most trivial expense, results of the highest importance, alike to the Meteorologist, the Engineer, the Medical Officer or the cultivator,

Probable value of final results. Some reports to be rejected: others well worthy of reduction.

to one and all of whom the rainfall to be looked for in any special locality is frequently an object of anxious inquiry and of deep interest.

Mr. Bayley's gauges considered generally sufficient.

5. The gauges hitherto employed, though extremely rough and unpromising in appearance, are capable—IF HONESTLY AND CAREFULLY USED—of giving the information desired, viz., mean results, within four or five per cent. of the actual truth, as derivable from the highest class of records aided by the best instruments. By way of comparison two such gauges were registered here throughout the seven years 1855 to 1861, and the final means or averages were found to differ only from that of the large old standard gauge, in the one case by 2¼, in the other by 3½ per cent. It is not however to be expected that the country measurements will have been made so carefully or so accurately as those by the regular Observatory Assistants. The most objectionable part of the present arrangement is undoubtedly the little tin ounce measure for one-tenth of an inch—so liable to be miscounted after heavy rain—so certain to be frequently overrun, and almost impossible to sub-divide accurately. The ordinary half pint glass measures, containing eight ounces of water, and graduated to half ounces, *i. e.*, 0·05 inch of one of Mr. Bayley's gauges—easily sub-divided by estimation to fifths of a division or 0·01 of an inch, should have been used throughout, and would have saved numerous errors which now doubtless vitiate, more or less, most of the returns. It is no plea to urge that glass measures would inevitably be broken: if so they should be replaced immediately at the cost of the user, whenever negligence is discoverable. I strongly urge the immediate supply to every station at which a Bayley's gauge is in use of a half pint glass measure graduated to ounces and half ounces such as those issued by the Medical Store Department of this Presidency.

The small tin measures condemned and glass graduated measures to be substituted for them.

Standard gauges desirable at a few principal stations.

6. To one or two principal stations in each District I would say, by all means let a superior class of gauge be furnished. A very neat, strong, and complete form of copper gauge, one of which I have just substituted, after careful testing, as the future Observatory standard can be had from the Stores of the Department Public Works, price on indent Rupees 18-13-7. The circular rims of these gauges are eight inches in diameter; the copper vessel will hold upwards of sixteen inches of rain, and a distinctly graduated glass measure is provided, in the use of which nothing but the grossest carelessness could introduce any uncertainty or error.

Full descriptions of all old gauges desired; and no new ones to be issued until tested and registered at the Observatory.

7. Wherever Mr. Bayley's gauges now in use are retained, the most complete and satisfactory replies to the queries appended to Form B should be given. Also, no fresh gauges of any description should be issued, until after being duly tested, numbered, and registered at the Observatory.

Other Meteorological records not received; but co-operation on certain points desirable.

8. No copies of Barometrical or other records have yet reached me from any of the Zillah Surgeons; and unless authentic details in regard to instrumental corrections, as obtained by comparison with reputed standards can accompany such observations, their discussion would be mere waste of time. On the other hand, if a few such gentlemen, interested in Meteorology and provided with really good instruments, would undertake to co-operate with me, most especially as regards temperature, humidity, velocity and direction of wind, and amount of ozone, their results would possess great interest, and would be most acceptable aids to our yet limited acquaintance with the health affecting elements of Meteorology in this Presidency.

Printed uniform Forms issued to each District will greatly facilitate the labor of reduction.

9. Should my humble suggestions be honored by the approbation and adoption of Government, I beg to remark, that it would greatly facilitate our endeavours in the arrangement of the records supplied, if the two blank

Forms A and B were printed *on foolscap paper*, and distributed through each Collectorate, so as to ensure that uniformity so desirable for ready reference in dealing with a mass of figures, such as we may expect to accumulate in the course of a short time.

No additional assistance desired beyond payment to present Assistants for their work done out of office hours at a fair remuneration per report.

10. In conclusion, I have only to add, that as a change of staff, calculated it is hoped to render this establishment better suited to the demands of modern science is already under the consideration of Government, the desired reductions would be more economically effected by the Assistants of the Observatory, in their over time, at reasonable remuneration, as proposed in paragraph 3, than by any temporary engagement of an inexperienced hand. The impossibility of procuring a proper substitute when an Assistant is absent on leave, long since convinced me of the inutility of seeking casual aid worth having in Madras; while the plan suggested would not only ensure accuracy and despatch, but would further have the beneficial effect of encouraging men, able and willing to assist in the manner required.

FORM A.

Daily Rain report of the District for 186 .

Day of month.	Stations at which Rain Reports are kept.							
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
First half.....								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								
31								
Second half.....								
Total of month.....								
Total since Jan. 1..... ...								
Percentage of average.....								

FORM B.

Daily Rainfall as registered throughout the year 18 at
in the District

Approximate North Latitude. ....
Ditto East Longitude.....
Usual hour of measurement.....
Kind of gauge used.....

Height of receiver of Rain gauge.
Above Sea Level Above surrounding ground.
feet feet.
Direct distance from Sea Coast, miles.

It is particularly requested that the general nature of the soil for some miles around; the distance from and bearing of any considerable hill or mountain range, with its approximate height; or the same particulars relative to any river in the vicinity, stating roughly its average width; or any other peculiarities of position may be communicated to the Government Astronomer at Madras for his information and guidance.

Day.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
First half.....													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													
26													
27													
28													
29													
30													
31													
Second half.....													
Total of month..													

Total rainfall during the year inches; being per cent. of the average of years
greatest fall inches, on Rain fell on days

ORDER THEREON, 11th February 1863, No. 156.

In this letter the Astronomer makes certain suggestions in regard to the register of rainf and other Meteorological records, with a view to their being turned to practical account by accurate digestion and compilation of the results obtained in different parts of the Presidency.

2. As regards the rain reports the measures recommended are the adoption of a new for (A) for recording the rainfall in future; the preparation in a prescribed form (B) of comple copies of all registers hitherto kept at each separate station; the improvement of the gauges no in use by the substitution of a half pint graduated glass for the common tin ounce measures; t adoption at a few principal stations of an improved copper gauge of the same standard as is e ployed at the Observatory; all gauges being in future issued through the Observatory, where th will be duly tested, numbered and registered. The necessary orders for carrying out these su gestions will be passed in the Revenue Department. A number of forms, A and B, printed foolscap paper, will be supplied to the same Department for distribution to the Collectors.

3. In respect of Meteorological Observations, Mr. Pogson reports that, as yet, no Baron trical or other records have been communicated to him by any Officers of the Medical Depa ment, and he suggests certain points, as, for instance, temperature, humidity, velocity and dire tion of wind, and amount of ozone, on which the co-operation of such gentlemen would be m acceptable. These remarks will be referred to the Principal Inspector General Medical Depa ment, who is requested to state what assistance may be looked for from the Zillah Surgeons. M Cole will, at the same time, explain why no copies of the Meteorological registers, received fr the Zillah Surgeons, have, as directed by Government in their Order of the 28th July la No. 889, paragraph 2, been yet furnished to Mr. Pogson.

4. In lieu of employing extra hands to examine and reduce the various old records, t Astronomer recommends, as a preferable and more economical arrangement, that some of t best Assistants on his establishment should be entrusted with the duty, and that for such ad tional labour, which can only be undertaken after office hours, they should be proportionat remunerated. This suggestion is generally approved, but Mr. Pogson will submit the amou of the remuneration which he may deem proper for each case for the special sanction of Gove ment.

(True Extract.)

Chief Secretary

To the Government Astronomer.
" Revenue Department,
(with Order No. 889.)—
" Principal Inspector General Medical Department.
" Department Public Works.
" Superintendent Government Press.

Exd. T. McMootry.

Proceedings of the Madras Government, Public Department, 28th July 1862.

Read the following:—

No. 147. MINUTE BY THE HONORABLE THE PRESIDENT, dated——July 1862.

In many Districts of the Presidency, I believe, some kinds of Meteorological observations are made and recorded, but so far as I can ascertain, no attempt has as yet been made to arrange these, to compare the results of one year with those of another, or in fact to deduce from them results which might have any practical tendency or which might lead to a knowledge of the Laws which regulate the succession of Phenomena, if indeed there be such Laws.

I think it would be of great use both to the community and the Government, if the records of the observations already made were placed in the hands of the Astronomer, with a request that he would examine and report upon them in their existing form, and would make such suggestions as to the mode of keeping such records from henceforward as would simplify the comparisons to be made by establishing uniformity in the observations. I hear constantly remarks as to the deterioration of the climate, the want of rain, the consequent falling off in the crops, &c., and these complaints are often accompanied by suggestions as to the cause of this change—for my own part, I doubt the fact of any change, but whether I am right, or those who complain of the change, it would be very desirable that we should by some reliable series of observations establish or contradict the statement.

The Astronomer should be asked to state what additions to, or changes in, his Establishment would be required to enable him to carry out fully the reduction and comparison of the observations sent to him from the different Districts, and, as I am aware, that he is desirous to remodel his Establishment he might be told to avail himself of the opportunity to do so.

(Signed) W. T. DENISON.

No. 148. ORDER THEREON, 28th July 1862, No. 889.

With the view of carrying out the suggestions made in the foregoing Minute, the Governor in Council requests that the Board of Revenue will furnish the Government Astronomer with copies of the monthly reports submitted by the Collectors, showing the fall of rain in their respective Districts.

2. The Principal Inspector General, Medical Department, will also supply Mr. Pogson with copies of the Registers received from the Zillah Surgeons showing the indications of the Barometer and Thermometer.

3. The Astronomer will report what additions to, or changes in, his present Establishment will be required to enable him to carry out fully the reduction and comparison of the observations to be sent to him from the different Districts.

(Signed) A. J. ARBUTHNOT,
Acting Chief Secretary.

Exd. F. Cartledge.

No 428.

Ordered to be communicated to the Board of Revenue with a request to instruct the Collectors to furnish the Govt Astronomer regularly with the return of rain-fall in the form A and to forward to that Officer at an early date copies of the registers of past years in the form B. The Board will supply to the Collectors in communication with Mr Pogson the half pint graduated glasses proposed by him and fix the principal stations at which the improved copper gauge should be adopted. Blank forms of

of the proposed returns will be
transmitted to the Boards Office
by the Superintendent of the Govt
Press-

The Board will submit
a list of the stations in each District
at which Rain gauges are kept by
Revenue Officers and will state what
means Collectors have of ensuring
their being properly
managed and the results accu-
-rately registered.

Govt Gauges 3
27 Rain Gauges
14 Board of Revenue Gauges 28
5 Public Depts
1 Supt Govt Presses

Recd 1863 Oct.br
Pro: of Govt for Febr.
No. 420.

Proceedings of the
Madras Govt. in
the Public Dept.

Dated 11th July
Recd 17th July
1863.

No

Pro-of the Bd of Revenue dated 4th July
1863 - No. 1361
Letter do - 8 Sept 63 Rec.d
2190 ditto

Passing orders on a
letter from Govt. Astronomer
making certain suggestions
in regard to the Rain reports
and other Meteorological reports
made throughout the Presid.

No 428 - 27 Feby

No 411 & 412