1. Number of pages.
2. Date of repair. 13-
3. Initials of Reference.

M.R.O. 1—82,406—23-11-40

MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

Con. 23. 6. 37

G.O. No.	1214	Press Mis.
14-15 Dated	23. 6	1837.

Not to be folded or roughly handled

13. 7. 37

Fort Saint George, Public Works Consultation of 23rd June 1857.

No. 94. Read the following Extract from the Proceedings of the Chief Engineer ; dated 27th May 1857, No. 738.

Read the following letter from WILLIAM FRASER, Esq., Civil Engineer ; to Colonel FABER, Chief Engineer, dated Ootacamund, 26th April 1857.

SIR,

I have the honor to acknowledge the receipt of your letter No. 11501, which did not reach me until to-day, inconsequence of being sent to Coimbatore my late encampment &c.

The Barometer alluded to by Major Thullier, even though it should be a first class instrument, would not answer for this District, as it reads down to only 24,500.

A. Barometer to be serviceable here should read down to *at least* 22,000.

If new Barometers be ordered, the scale should be graduated from 11 or 12 inches up, so as to make them available for observations at any known height. This involves the additional graduation only.

Whatever description of Instrument may be selected, the following points should be carefully attended to by the maker.

1st. The Bore should be equal throughout and should not be less than $\frac{1}{4}$ of an inch.

2. The Mercury should be absolutely pure and should be boiled at every part of the Tube or, the Tube should be filled under an air Pump as practised by Professor Daniell.

3. To prevent minute particles of air getting, in the course of time into the Barometer Tube, a ring of Platinum, or of some other metal which will be wetted by Mercury, should be so placed as to cut off communication with the external air.

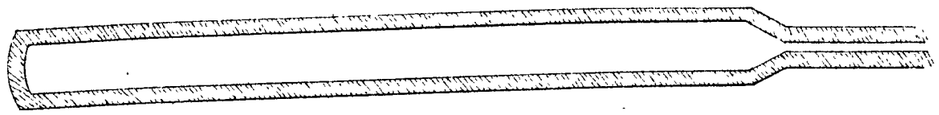
If thus be not done, air will, after some time, get in and render the instrument useless, and make it necessary to take out the Mercury clean the Tube, fill it again, &c., a process which would be scarcely practicable in this country. Platinum is the best metal for this purpose, as it welds with glass, and it is now obtained so plentifully, that probably the whole cistern could be made of it without much addition to the cost.

4. If a cistern Barometer be chosen, the adjustment should be made by *bringing down* the Zero of the scale to the surface of the Mercury in the cistern and not by raising the surface of the Mercury to the Zero *of the* scale.

5. No cement of any kind greased leather, India rubber or any similar substance should be used for stopping any part of the cistern. In short, no materials but metal and glass should be used in any part of the Instrument.

6. The attached Thermometer should have its bull ***not in the Mercury in the cistern*** but in the case close to the Barometer Tube, and its Tube should be as long as possible, and capable of reading up to at least 180° Fahrenheit.

It would be a great improvement if the attached Thermometer, instead of a Bulb, had a considerable length of Tube of the same bore, as the Barometer Tube thus.



This would give great length to the Thermometer, and being placed along the side of the Barometer Tube, equality of temperature of the two Instruments would be almost insured.

7. A dry and wet Bulb Thermometer should accompany each Instrument.

These should be two perfectly similar Thermometers, connected together and should be read by the same scale, which should extend to at least 180° Fahrenheit.

8. The value of a mountain Barometer depends so much on its capability of being made portable, and of being carried about safely without having to resort to extraordinary care, that

the attention of the maker should be drawn especially, to these points. None but a maker of reputation should be chosen, for ordinary makers do not understand the necessity for care in these matters. As an instance of carelessness I may mention that a mountain Barometer lately lent to me had its screw holes pierced right into the cistern, so that when the screws got loose, as screws will, the Mercury escaped.

9. A description of the Instruments mode of making them Portable, mode of preparing them for observing, how they should be carried, &c. &c., should be furnished by the maker.

10. Each instrument should be compared with the standard Barometer of the Royal Society and the index error engraved upon the scale.

11. The case should form a Tripod Stand for the instrument.

12. The maker should deliver them at Madras at his own risk, which will make him pack them carefully.

Resolved to forward a copy of Mr. Fraser's letter, dated 26th April 1857 to Government, and to recommend that a copy of Mr. Fraser's letter be forwarded to the Honorable Court, with the request that six barometers of the required description be sent out to Madras.

2. Resolved also to forward a copy of Mr. Fraser's letter to Major Thullier, and to thank the latter Officer for the information which he has kindly furnished on the subject of the supplies of Barometers obtainable at Calcutta.

(Signed) C. E. FABER, Colonel.
Chief Engineer.

No. 95. ORDER THEREON, No. 1214; dated 23rd June 1857.

It is observed that on the recommendation of the Chief Engineer conveyed in his Proceedings of the 29th January 1857 No. 9864, the Government have already applied to the Honorable the Court of Directors for six of Gay Lussac's Mountain Barometers. They are not aware whether the number of Barometers now indented for are required in addition to, or in substitution for, the above supply, and before again addressing the Honorable Court, they resolve to call upon the Chief Engineer for an explanation on the subject. The Chief Engineer will also be requested to report why he omitted all reference to the previous application.

(Signed) H. FORBES,
Acting Secretary to Government.

No 938

Extract from the Proceedings of the Chief Engineer in the Department of Public Works Fort St. George

Under date the 27th May 1857.

Read the following letter

Civil Engineer's Office
Octacamund
26th April 1857.

From
William Fraser Esqre
AC Supt

To
Colonel Faber
Chf Engr
Fort St. George

Sir,

I have the honor to acknowledge the receipt of your letter No. 11,501, which did not reach me until to-day in consequence of being sent to Coimbatore my late encampment for.—

The Barometer alluded to by Major Thullier, even though it should be a first class instrument, would not answer for this District, as it reads down to only 24,500.—

A Barometer to be serviceable here should read down to at least 22,000.—

If new Barometers be ordered, the

the scale should be graduated from Nor 12 inches up- so as to make them available for observations at any known height- This involves the additional graduation only.-

Whatever description of Instrument may be selected, the following points should be carefully attended to by the maker.-

1st The Bore should be equal throughout and should not be less than ¼ of an inch.-

2 The mercury should be available pure and should be boiled at the top part of the Tube- or, the Tube should be filled under an air pump.- as practised by Professor Daniell.-

3. To prevent minute particles of air getting in the course of time into the Barometer Tube, a ring of Platinum or of some other metal which will be melted by mercury, should be inserted as to cut off communication with the external air.-

If this be not done, air will after some time get in and render the instrument useless, and make it necessary to take out the mercury clean the Tube fill it again up, a process which

would be scarcely practicable in this country- Platinum is the best metal for this purpose, as it melds with glass, and it is now obtained so plentifully, that probably the whole Cistern could be made of it without much addition to the cost.-

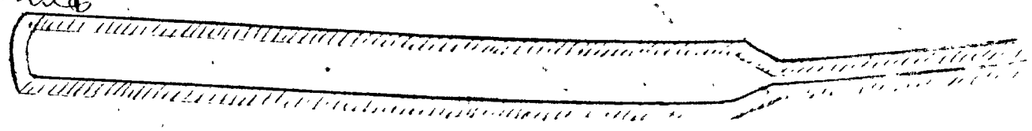
4. If a Cistern Barometer be chosen, the adjustment should be made by bringing down the Zero of the scale to the surface of the mercury in the Cistern and not by raising the surface of the mercury to the Zero of the scale.-

5. No Cement of any kind- grease- leather- India Rubber or any similar substance should be used for stopping any part of the Cistern- in short- no materials but metal and glass should be used in any part of the Instrument.

6. The attached Thermometer should have its Bulb not in the Mercury in the Cistern but in the Case close to the Barometer Tube- and its Tube should be as long as possible- and capable of reading up to at least 30° Fahrenheit.-

It would be a great improvement if the attached Thermometer, instead of a Bulb, had a considerable length of Tube.

Tube of the same bore as the Barometer Tube thus



2. One would give great length to the Thermometer, and being placed along the side of the Barometer Tube, equality of Temperature of the two instruments would be ensured.

3. Any and every Thermometer should accompany each instrument.

4. These should be two particular similar Thermometers Connected together and should be read by the same Scale which should extend at least 180° Fahrenheit.

5. The value of a Mountain Barometer depends so much on its Capability of being made portable and of being Carried about safely without having to Resort to extraordinary Care, that the attention of the maker should be drawn especially to these points. None but a master

of reputation should be chosen - for ordinary makers do not understand the necessity for Care in these matters As an instance of Carelessness I may mention that a Mountain Barometer lately sent to me had its seven holes pierced right into the Cistern, so that when the screws got loose, as screws will, the mercury escaped.

6. A description of the instruments mode of making them Portable mode of preparing them for observing how they should be Carried, & by whom should be furnished by the maker

7. Each instrument should be Compared with the Standard Barometer of the Royal Society and the index error engraved upon the Scale.

8. The case should form a Tripod Stand for the instrument.

9. The maker should deliver them at Madras at his own risk which will make him pack them Carefully.

I have &c
Sd/ R. Fraser
Civil Engr

Resolved

1 Resolved to forward a copy of Mr. Fraser's letter dated 26th April last to Government, and to recommend that a copy of Mr. Traver's letter be forwarded to the Honorable Court, with the request that Sir Barometers of the Required description be sent to Madras.—

2 Resolved also to forward a Copy of Mr. Fraser's letter to Major Sandilands, and to thank the latter Officer for the information which he has kindly furnished on the subject of the supplies of Barometers obtainable at Calcutta.—

To
Prince Regent
Secretary Govt.
Chief Engr.

Do
Secretary to Govt
P.W.D.

Exd. W

Public Works Dept.

No. 1214

Extract from the Minutes of Consultation
Under date the 23rd June 1857.

Read the following

Extract from the Proceedings of the
Chief Engineer.

(Here enter 27th May 1857 No. 788)

It is observed that
on the recommendation of the
Chief Engineer conveyed in
his Proceedings of the 29th January
1857 No. 9864, the Government
have already applied to the
Honorable the Court of Direc-
tors for six of Jay Lefsac's &c
Mountain Barometers. They
are not aware whether the number
of Barometers now indented
for are required in addition
to, or in substitution for, the
above

Public Works Dept.
Consultation 23rd June 1857
No. 1214

Extract from the Proceedings of the
Chief Engineer
to Government
dated 27th May 1857
Rec'd 29th ditto

No. 788 of 1857.

From Major Thomas Oldham R.E.
Chief Engineer
To The Secretary to Government

Dated Simla 27th May 1857

Sir,

I have the honor to forward Captain Waugh's letter No. 1211 of the 23rd instant, with its enclosure, and to request that the Barometers mentioned in the latter may be indented for.

2. I would also request that Captain Waugh may be authorized to purchase a Camera Lucida, and to draw upon me for the amount.

I have &c
(Signed) T. Oldham
Major
Chief Engineer

Copy to Capt. Waugh R.E.
for information.

By Order &c
(Signed) H. Elliot
Secy to Govt

No. 1211 of 1857.

From Captain J. T. Waugh R.E.
Secretary to Government

Dated Camp Kotgurh 23rd May 1857

Sir,

I have the honor to forward the accompanying letter addressed to me by Major Thuillier, stating that he requires 6 Barometers, and requesting that I will make arrangements for procuring them.

2. I would also request that I may be authorized to purchase a Camera Lucida, and to draw upon Government for the amount.

I have &c
(Signed) J. T. Waugh
Captain R.E.

Copy to Major Oldham R.E.
for information.

By Order &c
(Signed) H. Elliot
Secy to Govt

above supply; and before again addressing the Honorable Court, they resolve to call upon the Chief Engineer for an explanation on the subject. The Chief Engineer will also be requested to report why he omitted all reference to the previous application.

J R

J. Copy to the Chief Engr. Dec. 24

Copy sent in a Letter to E. of 17th July 1857. No 10.

Public Works 185 Add. Ctt.
Bus 23d. June.

No 1214.

Extract Minute of Bus:
of 23d June/57.

Extract from the Min: of the Chief Engineers of 27 June/57 No 1300 in

Observing that Govt are not aware whether the number of Barometers now indented for are required in addition to, or in substitution for those of Gay Lussacs mountain Barometers which have been already applied for by this Govt + resolving to call upon the Chief Engr for an explanation on the subject.

No 1214

No 4495.

c/y Dunn 820 4t