M.R.O. 14—13,000—27-9-24.

# MADRAS RECORD OFFICE.

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## Government of Madras.

Revenue **DEPARTMENT.**

G.O. No. 309 Press ~~Mis.~~

253. 294

Dated 20. 2. — ~~19~~ 1864

***Not to be folded or roughly handled***

No. 203. Read the following letter from Captain W. H. HESSEY, Acting Superintendent of Revenue Survey, to J. D. SIM, Esq., Secretary to Government, Revenue Department, Fort Saint George, dated Chepauk, 9th February 1864, No. 82/5:—

SIR,

1. In accordance with direction contained in G. O. 21st December 1863, No. 2,352, I have had the Theodolites of Barrow's make carefully examined by the Mathematical Instrument Maker, Mr. Doderet.

2. He reports them faulty and in their present state useless. They may be made serviceable by an expenditure of from 15 to 20 Rupees on each instrument.

3. As instruments indented for are generally received about two years after the date of the indent, it is probable that the Superintendent of Survey will be in want of instruments before a fresh supply in lieu of these can be obtained.

4. I beg therefore to be permitted to have these instruments repaired in the manner suggested by Mr. Doderet.

No. From Mr. F. DODERET, Mathematical Instrument Maker, to Major J. H. M. SHAW STEWART, Deputy Secretary to Government, Public Works Department, dated Chepauk, 1st February 1864.

SIR,

1. In obedience to your instructions conveyed in your Memorandum of 6th January 1864, No. 624, I beg respectfully to submit the following report on nine Theodolites received from the Superintendent, Revenue Survey, for examination. There are four instruments, Everett's pattern, of the lot now received, three of which have been examined and reported on, on a former occasion, in a report of mine respecting Everett's instruments. I then remarked that those instruments were too slightly made for the Department which require to use them, as they often come into the hands of careless persons who treat them very roughly; but I have no doubt if used by experienced gentlemen they would answer, as there are few instruments of the same size and pattern by other makers which are stronger and thicker in metal, desirable as it is to have them so especially in the Y and axes for this country, and for this Department. I repeat that the object glasses of the four Telescopes of the four instruments are quite spoilt, as the second crown glass is oxided, and has the appearance of a glass before it is polished. If instructions were given at home to have the glasses (as some of the German and French Opticians have them) cemented together with Canada Balsam or Turpentine of Venice, the damp could not then settle between the crown and flint glasses during the transmission through different climates. I have lately re-placed twenty-three crown glasses, spoilt by the same cause, and belonging to levelling instruments partly by Elliot Brothers and partly by Barrow. Relative to the general workmanship I beg again to refer to my former report. I have directed my closest attention to try and detect the cause of the incorrect readings of the divided circles, as I was firmly impressed that no maker could think so little of his reputation and of the supply to Government of instruments as to send badly divided instruments, nor do I believe that the examining parties at the East India Office would pass badly divided instruments, and I can trace it only to the following causes:—

*First.*—The lower circle being of cast brass and the vernier plate of rolled (sheet) brass, the expansion and contraction of metal of different imperforations would be so unequal as to cause such errors. I found that the divisions of the vernier were too large to the circle of the divisions they describe, but if by some means the verniers were brought further out so as to fit in the divisions of the lower circle they will read as correct as is wanted for the purpose required; the difference of expansion in cast and sheet (rolled) brass is to the inch from freezing point to 212 Fah. by the former ′/533 and the latter ′/517.

*Second.*—Supposing that the instrument has been divided in the winter time at home under a temperature of 3 to 4 below freezing point, and sent out and set up under a tropical sun of 120 to 125, it will be found that the expansion is very considerable.

## *Proceedings of the Madras Government, Revenue Department, 20th February 1864.*

2. Taking into consideration that the circle is about eighteen times heavier than the vernier plate, the expansion will be much larger on the circle than on the vernier plate, and the circle by larger expansion leaves the vernier plate behind, and the divisions of the same will be too large to the circle divisions.

3. By the kind permission and advice of Captain Hessey, Acting Superintendent Revenue Survey, I have according to his verbal instructions hammered out the vernier plate of instrument No. 1,090, so that the vernier describes a larger radius and the vernier will fit to the divisions. I have also re-placed the spoilt crown glass, and I believe the instrument will now answer. In conclusion, respecting these instruments, I have to add that in the details they are not as good as those of Troughton and Sims or Elliot. I have also examined the five transit instruments and I find that all the object glasses of the Telescopes are spoilt from the same causes above alluded to. I have likewise re-placed the crown glass of instrument No. 1,086, as I wanted to examine the divisions and could not look through the Telescope from the above, mentioned causes. I find those instruments as good as of other makers, the axis are correct, and it keeps very good in level by turning of either vernier or lower circle; the upper vernier belonging to the transit circle did not fit the divisions, were too large, most likely from the same causes before alluded to; I have corrected this by hammering out the arms of the vernier plate. I find there is no reflecting eye-piece to the Transit instrument, and as it is incovenient to take the altitude of the sun without one, I have by instruction of Captain Hessey added one, and those two instruments so corrected and adjusted have been sent to the Superintendent Revenue Survey, and if approved of by him I am able to undertake the necessary repairs, corrections and adjustments. In conclusion I beg to say that to put those instruments sent to me in proper working order it will entail a cost for each instrument of 15 to 20 Rupees.

Waiting for orders to do so.

(True Copy.)

*Chepauk,*
*9th February* 1864.

(Signed) W. H. HESSEY, Captain,
*Acting Superintendent Revenue Survey.*

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No. 294. ORDER THEREON, 20th February 1864, No. 309.

The Secretary of State having been informed that the defective Theodolites will be retained, in Store pending his orders, the Government do not deem it advisable to repair and use them as proposed, unless this be absolutely necessary. This letter and its enclosure will, however, be sent to the Secretary of State in continuation of the papers already forwarded to him.

(True Extract.)

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

To the Superintendent of Revenue Survey.
„ Public Works Department.

Exd. S. T. Augustin.

Rev. Survey Office
Chepauk
9th February 1864

No. 82
5

From

Captain W. H. Hessey,
Actg. Superintendent Revenue Survey

To

J. D. Sim Esquire
Secretary to Govt. P.W.D.

Sir

In accordance with direction contained in G.O. 21st December 1863. No. 2352 I have had the Theodolites of Banows made carefully examined by the Mathematical instrument maker Mr. Doddered.

2. He reports them faulty and in their present state useless they may be made serviceable by an expenditure of from 15 to 20 Rupees on each instrument.

3. By instruments indented for are generally received about 2 years after the date of the indent, it is probable that the Superintendent of Survey will be in want of instruments before a fresh supply in lieu of these can be obtained.

4. I beg therefore to be permitted to have these instruments repaired in the manner suggested by Mr. Doddered.

I have the honor to be
Sir
Your most Obedt Servant

W. H. Hessey Captain
Actg Superintendent Rev. Survey

Rec: 21 Feby/64 Nos 373-374

Copy to a Letter to England
of 20th February 1864 R: 10

From the Supt of Revenue
Survey of 18 March 64.
& No. 423. via Pko.

No. 294.

15 Feby/64 R 18th

Revenue 1864 Dept
Supt of Survey for February
No. 369.

The Secretary to Government Punjab

The Secretary to Government Punjab

Dated 9th
Received 23rd February 1864

No. 42/5

Enclosure one

Subject
No 309 20 Feby

Forwards copy of a report from the Mathematical Instrument Repairer attached to H.M. Mission requests permission to have the theodolites now in hand of Mr Brown made repaired —

Lieut Colonel

No. 309.

The Secretary of
having been informed that
defective Theodolites, will be
-tained in store pending the
orders, the Govt do not deem
-visable to repair and use th
as proposed unless this be
-solutely necessary - This lette
its enclosure will, however, b
to the Secretary of State in con
-ation of the papers already
-warded to him —

From Lt Genl
20th Feby 1864
To The Supt Rawl Survey
Dept 23rd Feby
Public Works Dept

10
21 " "