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MADRAS RECORD OFFICE.

Government of Madras.

Public works DEPARTMENT.

Cons. 2-2-35

G.O. No. 145 Press
Mis.

39-87

Dated 2-2- 19 35

Not to be folded or roughly handled

Fort St. George, Public Works Consultation of 2nd February 1858.

No. 80. Read the following letter from Lieutenant G. V. WINSCOM, Principal of the Civil Engineering College; to H. FORBES, Esq., Acting Secretary to Government, dated 25th January 1858, No. 17.

SIR,

Referring to Extract from Minutes of Consultation No. 2354, under date the 21st December 1857, authorizing me to undertake the construction of a Model of Southern India i. e. from the Nurbudda to Cape Comorin in general accordance with the ideas set-forth in Colonel Cotton's memo, on the subject, I have the honor to submit for the information of Government the following plan of the arrangements I purpose making for carrying the same into effect.

2. The scale of 4 miles to the inch proposed by Colonel Cotton, appears to possess many advantages, but chiefly because it is the scale of the published copies of the Trigonometrical Survey Map. For the model this would give an extreme length of 19½ by a breadth of 17′ an this, as regards breadth would be the extreme that would conveniently go into a moderately sized room. It is a difficult matter so to proportion the scale of height as to give a correct idea to the general observer of the real height of land, and yet to make the model really useful for scientific calculations: and this is particularly notable where the land contracts as in the vicinity of Cape Comorin, whilst yet the Mountains which terminate in the Cape remain as high and precipitous as much further North, say that the Peninsular narrows to 100 miles, the model would be only 25 inches in breadth, whilst the mountains remaining at 4,000 (allowing an average scale of ½ an inch to 100 feet) we should have them 20″ in height which appears exceedingly disproportionate, and yet allowing the highest land on the Neilgherries to be 8,000′ we should only have the greatest height 40″ or 3′-4″ and any thing less would scarcely answer to shew markedly the undulations of ground.

3. I am on the whole inclined to forego attempting to shew in the model itself with extreme accuracy the various levels, preferring to adopt a vertical scale more proportionate to the horizontal, so as to give a truer general idea of the country whilst sections of all the most useful levels and registers of all the minor levels obtainable might be respectively drawn on paper and hung on the walls of the model room or kept in the books of the office. It was in this manner observed the Geological records were kept in England in the Government Museum in Jermyn Street, and I fancy every expedient has there been tried to ensure the most commodious manner of giving the desired information.

4. The model might however be marked with small real figures at all chief towns, mountains and other points of note indicating the height of such places above the sea level, whilst the whole being done on one regular scale, *relative* height would be at once decerned and *absolute* height easily discovered with sufficient accuracy for ordinary purposes.

5. Colonel Cotton proposed a gradually diminishing scale as we ascend, but as extensive plateaux of land lie as in the case of Mysore, Beeder &c., at greater elevations than 2,500 feet, the observer would, comparing such areas of land with the plains of the Carnatic for example, imbibe false notions. A variation of scale above the height of 3,500 feet would be less objectionable as the ascents are sudden, and the elevated ridges of land comparatively narrow, and the mountains in model would look exceedingly steep. This is a question which might be decided on when more experience is obtained, I would therefore recommend to begin with a regular scale of ½ an inch to 100′ for all heights below 3,500 feet. Perhaps ⅜ of an inch might be adopted when land rises above that height. Models of particular districts for Collectors, District Engineers &c., might hereafter be formed on a larger scale both horizontally and vertically so as to be useful for working from. The smallest recognized working scale is 40′ to the inch; this if adopted in the large model would make Bangalore 7¼ high whilst the breadth of the model would be only 6¾ at the latitude of that place.

6. The system of tables running on rails recommended by Colonel Cotton I think would suit admirably.

7. The material I would recommend is Papier Mache; it is easily made and easily worked, but should corrections be found difficult to make in it I would then use Plaster of Paris; this would always allow alterations, and when any part should be even temporarily finished it might

be glazed by what is termed sterio-chromic process used for preserving frescoes which is as simple as effective, consisting merely of whitewashing the surface, and then syringing the same with the silicate of soda when silicate of lime is formed which is a transparent glass effectively preserving the substance beneath. The painting of the rivers, and the coloring to shew the different heights &c., would be done upon the whitewashed surface before glazing.

8. With regard to the establishment, I would not recommend any permanent one, because, the requirements will vary. For the first 9 months, whilst all is new and the levels have to be ascertained from a mass of records &c., an intelligent European under any orders would be a valuable assistance as the labor will be great. After that time I trust I should have things so advanced that I could carry the modelling on myself with inferior help. Four lads whom I find I can obtain from Doctor Hunter's school would answer very well as modellers with a little practice I think; they might be paid 15 Rupees each per month. An approximate estimate of the cost is as follows:

	Rs.
One European Superintendent and Draughtsman for 9 months, at 100 Rupees per month	
Four Modellers for 12 months, at 15 Rupees each per month	900
Two Modellers for 24 months, at 15 Rupees each per month	720
Cost of tables	720
One Lascar for 9 months, at 6 Rupees per month	180
One Draughtsman for 12 months, at 35 Rupees per month	54
	420
Total Rupees...	2,994

say 3,000 Rupees.

9. This sum it will be observed includes drawings of all the chief sections ever taken, (which may, as information arrives exhibit the Geological features likewise) and a duly arranged register of all levels.

10. I request that Government will order me to be supplied with copies of all the sheets of the Trigonometrical survey of Southern India and that the Chief Engineer and Consulting Engineer for Railways may be requested to furnish me with all the levels they may have in their possession of any extended lines of country.

P.S.—I request Government may be pleased to sanction an advance of Rupees 200, for making up the tables &c., at an early date.

No. 81. ORDER THEREON, No. 185; dated 2nd February 1858.

Ordered that the above letter be forwarded to Colonel A. Cotton for any observation he may wish to offer.

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

Madras 25th January 1858.

No 17.

From
The Principal of the Civil Engineering
College

To H. Forbes Esquire
Acting Secretary to Government
Public Works Department
Fort St George

Sir Referring to the Extract from Minutes of Consultation No 2354 under date the 21st December 1857 authorizing me to undertake the construction of a Bridge of Boats across the Cauvery at Grand Anicut in accordance with the ideas set forth in Colonel Cotton's minute on the subject, I have the honor to submit for the information of Government the following plan of the arrangements I purpose making for carrying the same into effect.

2 The scale of 4 Inches to the mile proposed by Colonel Cotton, appears to possess many advantages, but chiefly because it is the scale of the Published copies of the Trigonometrical Survey

map

map.— For the model this would give an Extreme length of 19½ by a Breadth of 14' and this, as regards Breadth would be the Extreme that would conveniently go into a moderately sized room.— and this a difficult matter to so proportion the Scale of Height: as to give a correct idea to the general observer of the real height of lands, and yet to make the model really useful for scientific calculations. and this is particularly available where the lands contracts as in the vicinity of Cape Comorin, or which gets the mountains or rich terminate in the Cape remain as high and precipitous as usual further North.— say that the Peninsular narrows to 100 miles the model would be only 25 inches in breadth whilst the mountains remaining at 4000 ft. (allowing an average Scale of ½ an inch to 100 feet) are should have been 20" in height: which appears exceedingly disproportionate; and yet allowing the highest lands on the Neilgherries to be 8000' are should only have the greatest height 40" or 3'-4" and any thing less would scarcely answer to shew marked by the undulations of ground.—

I

5

I now see the whole inutility of attempting to shew in the model with exactness & accuracy the various levels, preferring to adopt a vertical Scale more proportionate to the horizontal, so as to give a truer general idea of the country on which the outlines of all the most useful levels and registers of all the minor levels obtainable might be rectilinearly drawn on paper pasting on the walls of the model Room or Reception Room of the Office.— I have in this manner observed the Geological trend of more Extensive in England in the Government Emigration Office, Jermyn Street, and of every Exhibition that has been held to ensure the most commodious manner of giving the desired information.—

4 The model might however be marked with small red figures at all chief towns, mountains and other points of note indicating the height of such places above the sea level, which the whole being done on one regular Scale; relative heights would be as in ever determined much absolute height readily discovered with sufficient accuracy for ordinary purposes.—

Colonel

5. Colonel Cotton first noted a gradually diminishing scale as one ascended, such as extensive plateaux should be in the case of Mysore, Bedenoor &c. at greater elevations than 2500 feet, the observer should, comparing such areas of land with the plains of the Carnatic for example, be inclined false notions. A variation of scale above the height of 3500 feet would be less objectionable as the ascents are seldom, and the elevated ridges of land comparatively narrow, and the mountains the model should look steeply rocky. This is a question which might be determined on new more experience is obtained, I should therefore recommend to begin with a regular scale of 1/2 an inch to 100' for all heights below 3500 feet. Perhaps 3/8 of an inch might be adopted when land rises above that height. Models of particular districts for Collectors, District Engineers &c. might hereafter be formed on a larger scale both horizontally and vertically so as to be useful for working from. The smallest recognized working scale is 40' to the inch; this is adopted in the large model now making at Bangalore

7/14

7/14 high or which the breadth of the model should be only 6 3/4 which the latitude of that place.

The dip & strike of stables running on rails recommended by Colonel Cotton & others should be duly observed.

4. The material should be recommended is Papier Maché; it is easily made and easily worked, but should corrections be found difficult to make in it should be new made. Plaster of Paris, this would always allow alterations, and when any part should be seen temporarily finished it might be glazed by or which is termed electrotype process & used for preserving purposes which is as simple as effective, consisting merely of whitewashing the surface, and then depositing the same with the dilicate of soda or new dilicate of lime which is formed a hard transparent glaze effectively preserving the delicateness beneath. The painting of the rivers, and the coloring to show the different heights &c. should be done upon the whitewashed surface before glazing.

5. With regard to the Establishment I should not recommend any permanent one, because the requirements will vary. For the finish & smoothness, which all is

new

now and the levels have to be ascertained from a mass of records &c. an intelligent European under any orders would be of considerable assistance as the labor will be greatly after that time & should be saved by the modelling or any of an Engineer help. Your Lordship knows how & what we can obtain from Dr. Hunter's School models & instruments as well as modellers with a little practice & that they might be paid 15 Rupees each per month. An approximate Estimate of the cost is as follows.

One European Superintendent & Draughtsman for 9 months @ 100 Rs per month	900-0-0
Four Modellers for 12 months @ 15 Rupees each per month	720-0-0
Two Modellers for 24 months @ 15 Rupees each per month	720-0-0
Cash & Tables	180-0-0
One Peon for 9 months @ 6 Rs per mo.	54-0-0
One Draughtsman for 12 months @ 35 Rupees per month	420-0-0
Total Rupees	2994-0-0

say 3000 Rupees.

This sum should include drawings of all the Observations (or which may, as information arrives & exhibit the Geological features likewise) and a duly arranged register of all levels.

10 I request that Government will order me to be supplied with copies of all the sheets of the Trigonometrical survey of Southern India and that the Chief Engineer and Consulting Engineer for Railways may be requested to furnish me with all the levels they may have in their possession of any extended lines of Country

I have the honor to be

Sir

Your most Obedient Servant

Geo. Thos. Walker Lieutenant

Principal Asst. to the Civil Engineer & Collector.

P.S. I request Government may be pleased to sanction an advance of Rs 200. for making up the tables &c. at an early date.

Geo.

Cons: 23d Dec 57 No 55456.

Copy sent to the Chief Engr & Consulting Engr: Jno Rastrick 29 March 58 S. 570.

No 80.781

Works 1858 Dispatches
Cons: 2d February
No 161.

From
The Principal Officer of the
E. I. College.
To
The Secretary to the
Government
P. W. D.

Date 58 25
Rec'd 26 } Jan 1858

From Mall. No. 1 Letter No 2
Madras 58 No 440 inclo 30-58-03
Public Department No 2. Pub
No 2354 of 21 December
1857 submits for the information of Government a plan & arrangements for the construction of a Conduit in Southern India, with an approximate Estimate of the Cost of the Establishment &c &c.

No 186. 2nd February 1858.
Let the order

Fort St George
2d February 1858

2 Copies to Col A. Cotton.
Cond of Engrs

Dis 23.

No 185.

Order. That the above letter be forwarded to Colonel A. Cotton for any observation he may wish to offer.