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MADRAS RECORD OFFICE.

Government of Madras.

Public Works DEPARTMENT.

Cons. 2-2-53

G.O. No. <i>115</i>	Press Mis.
<i>83-87</i> Dated <i>2-2-</i> 19 <i>53</i>	

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. WINSOM, 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 Nerbudda 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 $19\frac{1}{2}$ by a breadth of 17' and 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 $\frac{1}{2}$ 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 discerned 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 $\frac{1}{2}$ an inch to 100' for all heights below 3,500 feet. Perhaps $\frac{3}{8}$ 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 if adopted in the large model would make Bangalore $7\frac{1}{4}$ high whilst the breadth of the model would be only $6\frac{1}{4}$ 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

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

be glazed by what is termed steric-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 show 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:

One European Superintendent and Draughtsman for 9 months, at 100 Rupees per month.....	Rs. 900
Four Modellers for 12 months, at 15 Rupees each per month.....	720
Two Modellers for 24 months, at 15 Rupees each per month.....	720
Cost of tables.....	180
One Lascar for 9 months, at 6 Rupees per month.....	54
One Draughtsman for 12 months, at 35 Rupees per month.....	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. 14

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 extract from Minutes of
Consultation No. 2354 under date the
27th December 1857 authorizing me to
undertake the construction of a Model
of Southern India i.e. from the Vaidhar
to Cape Comorin in general accord
ance with the ideas set forth in Colonel
Cotton's memoir on the subject, I have
the honor to submit for the information
of Government the following plan of
the arrangements & purpose making
for carrying the same into effect.

2 The scale of 14 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.

enap. - For the model this would give
an extreme length of $19\frac{1}{2}$ 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 as 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, or hills up the moun-
tains which terminate in the Cape.
remain as high and precipitous as much
further North. - say that the Peninsula
is narrow to 100 miles the model would
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the mountains remaining at 4000 ft.
allowing an average scale of $\frac{1}{12}$ and inch
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proportionate; and yet allowing the
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J

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lieve attempting to show in the model itself
with extreme accuracy the various levels,
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proportional to the horizontal, so as to
give a truer general idea of the country and
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levels and registers of all the minor
levels obtainable might be respectively
drawn on paper hanging on the walls of the
model room or depicted in the books of
the Office. - I have in this manner
observed the Geological records and
depth in England in the Government
Museum in Serpentine Street, and of course
every specimen has there been tried to
ensure the most commodious manner
of giving the clearest information.

4 The model might however be
marked with small red figures at
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the whole being done on one regular
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easily discerned and absolute heights
easily discovered with sufficient accu-
racy for ordinary purposes.

Colonel

5. Colonel Cotton proposed a gradually diminishing scale as we ascend, such as extensive plateaus of land lie as in the case of Mysore. Below 2500 feet, the observer would, comparing such areas of land with the plains of the Carnatic for example, be liable to false notions. A variation of scale above the height of 3500 feet would be less objectionable as the ascents are a 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 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 recognizable working scale is 1/40' to the inch; this if adopted in the large model would make Bangalore

1 1/4

1 1/4 high or half the breadth of the model would be only 6 3/4 at the latitude of that place.

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

4. The material I would recommend is Papier Maché; it is easily made and easily modelled, but should be connected by joints difficult to make in it 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 or has is termed the varnish process used for preserving frescos which is as simple as effective, consisting entirely of whitewashing the surface, and then drying the same with the addition of soda or new dilute oil of turpentine which is a transparent glass effectually preserving the substance beneath. The painting of the rivers, and the coloring to show the different heights &c. might be done upon the whitewashed surface before glazing.

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 riving the modelling on myself or the inferior
 help. Four lads whom I wish I can obtain
 from Dr. 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 es-
 timate of the cost is as follows.

One European Superintendent Draughtsman	
Four of Smiths @ 100 Rs. per month	400-11-11
Four Modellers for 12 months @ 15	
Rupees each per month	720-11-11
Two Modellers for 12 months @ 15	
Rupees each per month	360-11-11
Cash of Tables	180-11-11
One Cassar for 12 months @ 6 Rs. per mo.	72-11-11
One Draughtsman for 12 months	
@ 35 Rupees per month	420-11-11
<u>Total Rupees</u>	<u>1294-11-11</u>

say 3000 Rupees.
 This sum it will be observed
 includes drawings of all the chief sections ever taken,
 (which may, as information arrives exhibit
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I have the honor to be

Sir

Yours most Obedient Servant

C. H. M. Cole. Assistant
 Principal of the Civil Engineering College.

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