PUBLIC WORKS REFORM IN INDIA

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FREDERICK TYRRELL

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Trieste

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IN

INDIA.

BY

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FORMERLY EXECUTIVE ENGINEER PUBLIC WORKS DEPARTMENT.

Si quid novisti rectius istis,
Candidus imperti; si non, his utere mecum.

LONDON:
EDWARD BUMPUS, HOLBORN BARS.

1873.

T. RICHARDS, PRINTER, 37, GREAT QUEEN STREET, LONDON, W.C.

PREFACE.

THE Author has ventured to publish this small volume in the hope that it may contain some idea that may be found useful in promoting the efficiency of the Public Works Department in India. He is aware that it is very superficial and entirely incommensurate with the importance of the subject. The magnitude of the interests at stake, and the dependence of so many millions on the efficient working of that department in India, have induced the Author to snatch what time he could from extensive farming operations, in order to contribute his mite towards so important a subject. He trusts that it may induce others with more knowledge and more skill to ventilate the subject further.

CONTENTS.

CONCLUSION.

APPENDIX.

Note to Page 13.

Vide *Public Works and the Public Service in India*, by Major Evans Bell and Lieut.-Col. F. Tyrrell.

PUBLIC WORKS REFORM IN INDIA.

It is, I believe, too common an idea in England, that the natives of India are without an engineering history, that there are no works extant of their engineering skill, and that they owe to us all that they possess in that department: such is not the case. India *has* an engineering history; not written in splendid palaces and lofty structures, yet still marked by works whose usefulness may vie with works of any other nation—works on which her life depends.

Some parts of India, particularly the south, are covered by a network of tanks; they are found, however, all over India, and the ruins of some bear witness to their immense size. Their number, and extent, and presence all over India, prove the general idea that was felt of their necessity. In order to give some notion of their size, I give the dimensions of four large tanks now in existence; there are, however, larger ones, but I have not any statistics of them by me.

District.	Name of Tank.	Height of Band.	Length of Band.	No. of Villages Watered.	Annual Average Revenue to Govern't.
		Feet.	Miles.		Rs.
Mellore ...	Cunnigherry tank	20	2	23	78,000
North Arcot	Cauvenpaukum tank ...	45	4	23	43,000
Chungleput	Chumbrumpaukum tank	25	3½	58	49,000
South Arcot	Veeraunum tank.....	21	9	149	114,500

In the Nagpoor and Hyderabad country of the Deccan, the ruins of extremely large tanks exist, now in the midst

of jungles, formerly the sites of a rich cultivation and a busy population. To the east of Hyderabad in the Deccan, and of Nagpoor, and even as far east as the Boad Country in Orissa, these remains are numerous—showing that at one time, even in those wild tracts (where at present there is little besides jungle) there was a thriving people.

The ancient engineering works of India in the south are, with the exception of tanks, neither very numerous nor well executed. The ancient Hindoo buildings are, in fact, more curious than works of engineering skill; they are, in many instances, extremely solid and strong, but the arch is seldom met with. Huge stones cover their temples, as in Humpee or Beejanuggur, founded by Virjza Ragu, A.D. 1119, on the banks of the Toongabudra; some of these measure twenty-four feet long by four feet wide, by one and a half thick. The chief attraction of the ancient Hindoo temple is, however, generally the elaborate carvings of figures, etc. The old bridges met with in India are not built on very scientific principles. These generally rise very high in the centre, with a gradient often of 1 in 6 to 1 in 10; there is generally a great want of waterway, and the approaches are often covered with water during floods. The old annicuts on the Coleroon and Toongabudra and other rivers are not neat constructions; they, however, gave us the idea, and are the foundation of our most successful irrigation works. The chief works executed by the old Hindoo rulers were tanks, of which there are thousands; many silted up, many in ruins, many dry by destruction of the supply channels. The investigation of the tank system of India, and the repairs and construction of tanks, is a matter that was brought to notice of Government strongly, vehemently, and repeatedly, by Captain A. Cotton (now Sir A. Cotton) in 1837, and constantly since by that eminent officer; it was backed by the Report of the Commission on the Public Works Departments in 1851, and all experience has tended to prove the soundness of those views, yet up to this time nothing has been done commensurate with the importance of the subject. I could myself point out

more than a hundred tanks that are in ruins; tanks that must have originally irrigated many hundred acres of land, and would probably in the aggregate water at least three thousand villages.

In Central India, and towards Bombay, we have many curious works, but not very instructive in an engineering point of view; such are the tombs of the Ghond Kings at Chanda, the forts of Gawilghur and Narnulla on the Satpoora range of hills, about three thousand feet above the sea, built extremely massively of black basalt, quarried on the spot; the lime must have been all brought up from the plains with great labour on the backs of bullocks. These forts were taken by Lord Wellesley in 1803. We have then the caves of Adjunta and Ellora, near Roza, and the caves of Elephanta in the Harbour of Bombay; the former were doubtless used by the Brahmins for religious purposes, and at an earlier period by the Buddhists. They have, however, always struck me as being originally of Egyptian origin. The capitals of the most ancient columns have a strong resemblance to the Egyptian form, and the paintings which formerly covered the caves of Adjuntah were painted on a material and with pigments exactly corresponding with those found in Egypt; and, comparing the figures themselves, there is often a striking resemblance; in some instances, one could well imagine the Egyptian idea depicted by an Indian hand. These temples were cut out of the amygdaloidal trap by a pick; the marks of the tools are still visible. The work was doubtless laborious, but required but little skill and no science.

The ancient Mahommedan rulers left us noble examples of architecture, elegance of design, massiveness, and science in construction. The Taj at Agra, and its very inferior copy at Aurungabad, are good examples of masonry. There are also some fine examples of stonework and scientific construction in the Mahommedan remains built by Yoosuf Khan in 1489, around the very ancient Hindoo city of Vijzapùra. They were also aware of the importance of canals, and commenced our present system in the north. Thus the history of native engineering in India as regards