

EGYPTIAN IRRIGATION.

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BY

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WITH INTRODUCTION

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ANCIENT SYSTEM OF IRRIGATION.

"Thus they do, sir: They take the flow o' the Nile
By certain scales i' the Pyramid; they know,
By the height, the lowness, or the mean, if dearth
Or foizon follow: The higher Nilus swells,
The more it promises: as it ebbs, the seedsman
Upon the slime and ooze scatters his grain,
And shortly comes to harvest."—*Ant. and Cleo.*, ii. 7.

MODERN SYSTEM OF IRRIGATION.

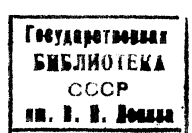
"Naturam furcâ expellas, tamen usque recurrit."



E. & F. N. SPON, 125, STRAND, LONDON.

NEW YORK: 12, CORTLANDT STREET.

1889.



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PREFACE.

THIS work embodies the information collected during four and a half years, of the irrigation systems of Egypt, and a *résumé* of the works carried out by Sir Colin Moncrieff. The author trusts it will be found useful by irrigation engineers generally, as some of the systems of irrigation are peculiar to the country, have been practised with eminent success these 5000 years, and might with advantage be copied in countries where the rainfall is insignificant. From the beginning to the end of the work the author has not hesitated to impress his firm conviction that the modern system of irrigation cannot last in a country where there is no rainfall, unless it is modified by the ancient basin system. Persons desirous of investing money in land reclamation schemes will find a great deal of information, and, the author believes, truthful information, about the lands themselves and the prospects of reclamation. Engineering questions, such as silt-deposits, drainage, irrigation, the Barrages, flood protection, methods of regulation, locks, specifications of works, and prices of work and labour, have been treated in detail. Agricultural questions, such as :—Amount of water needed for irrigation, duty of pumps, cost of rearing and yield of different crops, the cotton-worm, manures, and rotation of crops, are freely discussed. The legal and administrative sides of the irrigation

system have been described, while the whole corvée question has been thoroughly sifted. The Lake Mœris scheme for storing water is considered, as well as other projects for reclaiming land by basin and summer irrigation combined.

The tables, statistics, and appendices have been carefully prepared, and the author takes this opportunity of thanking the officers of the Irrigation and Finance Departments for the willingness with which they have supplied him with information; and of acknowledging having received valuable information from Mr. E. Floyer, Director-General of Telegraphs, Linant Pasha's 'Memoirs,' and Mons. Barois' book on irrigation. From Lieut.-Col. J. C. Ross, R.E., C.M.G., Inspector-General of Irrigation, the author has received the greater part of the information about basin irrigation, and it gives him sincere pleasure to record here that it is principally owing to Colonel Ross's constant aid and advice that he has been able to complete the work at all. The valuable discharge tables in Appendix K have been compiled by Colonel Ross.

W. WILLCOCKS.

Barrage, 30th March, 1888.

INTRODUCTION.

By LIEUT.-COL. JUSTIN C. ROSS, R.E., C.M.G.,

Inspector-General of Irrigation, Egypt.

MR. W. WILLCOCKS, M.I.C.E., one of the Anglo-Indian engineers called from India after the events of 1882 by Sir Colin Scott-Moncrieff, to aid him to carry out the policy of Lord Dufferin, has written this work on Egyptian irrigation after an experience of four and a half years in Egypt. He has had a closer intimacy with the real prop of Egypt—the fellah—than fell to the lot of his predecessors, the French engineers who have directed, since Muhammed Ali's time, the engineering science of Egypt. The real difference between the former system and the present one is, that formerly the European only directed from Cairo, and could not influence the Arab subordinates in the provinces, while under the Anglo-Indian arrangements the inspectors of provinces live and go on tours at will in the provinces, and are constantly among their Arab subordinates, and see the Shekhs daily and not merely in visits of ceremony, or at councils in the larger provincial towns.

While making comparisons with the results obtained from the French guidance up to 1882, and the results already gained and still to be gained by the Anglo-Indian engineer, it must constantly be borne in mind that firstly, the French