

Boulak, and to prevent this the Khedive decided on re-opening the whole passage. With this view, another bridge has been constructed over its dry bed, which is to be cleared out and the river re-admitted. This, which is also of iron, is 180 metres long, and, like the larger one, is planned to open for the passage of river craft, but, whether owing to the subsidence of the foundations or some defect in the construction, this part of its intended use is not likely to be realised, as the swing section is already so dislocated as to be practically locked. The work, which was constructed by an English firm, cost 40,000*l.*, and was also completed in 1872. Two other handsome but smaller bridges, which also open, have been built over the Ismailieh canal—one not far from the point in which it taps the Nile, and the other near the railway station—a fifth at Abbassieh, another at Foueh nearly opposite Atfeh, where the Mahmoudieh canal joins the Rosetta branch, and two over the latter canal itself at Alexandria. These are all substantial if not imposing structures, and would compare not unfavorably with similar works of their class in Europe.

There remains to be noticed the SUEZ CANAL, but its surpassing importance entitles it to a separate chapter.

## CHAPTER XII.

### THE SUEZ CANAL.

This Work a Source of Permanent Loss to Egypt—Its Political Compensations—Ancient History and Variations of the Scheme—Contemplated by Bonaparte—Conflicting Surveys—Opposed by Stephenson—Cairo-Suez Railway Constructed as Substitute—M. de Lesseps—First Concession from Saïd Pasha—English Opposition—Formation of Company—Commencement of Work—Fresh-Water Canal—Withdrawal of *Corvée* Labour—Reference to Emperor Napoleon—His Excessive Award—Further Financial Incidents—Description of the Canal—Economy of Distance—Seven Years' Traffic—Proportion of Flags—Dispute as to Dues—Its Settlement—Capital Account—Cost to Egypt—Compensations—Report of Directors for 1876.

THIS greatest of modern Egyptian public works not merely transcends all the rest in magnitude and cost, but differs from the whole in that, while the others are or will be reproductive and profitable to the country, it represents a distinct and more or less permanent loss. Not only has it cost the Treasury, in all, more than 17,000,000*l.*\* in money outlay, but it has diverted from the Egyptian ports and railways a large and increasing transit traffic of great revenue value, against which nothing but some trivial Customs dues will be received until the net earnings of the enterprise, after payment of debenture charges and statutory interest on shares, leave a surplus of profit, out of which, only, the Government is entitled to a fractional royalty of 15 per cent. It has, indeed, some political compensations in the closer *rappor*t with Europe into which it has brought the

\* Less the 4,000,000*l.* recouped by the sale of the shares to the British Government.



country and its ruler, and as an enterprise of cosmopolitan importance and value, it will historically illustrate the reign of the Prince to whose munificence its success is mainly due; but so far as Egypt itself is concerned it may be doubted if these acknowledged advantages have not been dearly bought.

The idea of the great scheme which has thus benefited the trade of the world at the expense of Egypt is as old as the Pharaohs. According to Strabo, water communication between the two seas was first opened by Sethi, a king of the nineteenth dynasty (*circ.* B.C. 1400), who cut a canal fifty-seven miles long from Bubastis, near the modern Zagazig, on the Pelusiac branch of the Nile, to Heröopolis, at the head of the Bitter Lakes, which then formed the northern extremity of the Gulf of Suez. Herodotus, on the other hand, post-dates the attempt by nearly eight centuries, and credits it to Necho II., whose channel followed the same line, which is also nearly that of the modern fresh-water canal. Fears, however, that the higher level of the Red Sea would result in a general inundation, led to the abandonment of this work after—if the historian does not exaggerate—120,000 men had perished in its construction. A century later, Darius, the son of Hystaspes, completed what Necho had begun, and added a further link of ten miles, by clearing a navigable passage through the low sandy isthmus which had in the interval formed between the Heröopolite Gulf and the Red Sea. Traces of this latter section are still distinguishable in the neighbourhood of Shaloof, near the southern end of the Bitter Lakes, and the fresh-water canal follows its course for some distance between that point and Suez. But the communication thus established involved the transshipment of cargo at Heröopolis, and to remedy this inconvenience Ptolemy Philadelphus (B.C.

285) joined the Nile canal with the Heröopolite Gulf by means of a lock and sluices, and where the short canal from the latter entered the Red Sea, founded Arisnöe, near the site of the modern Suez. History is silent as to the fortunes of the channel during the next two centuries; but the failure of Cleopatra's ships to escape through it into the Red Sea (B.C. 31), shows that it had then again become unnavigable, and it is doubtful whether Trajan or Adrian (A.D. 98–138) was the next who endeavoured to restore the line of communication. In the long historic interval thus spanned, the Nile had almost deserted its Pelusiac branch, and the Roman engineers therefore tapped the river above the Delta at Babylon (Old Cairo), and carried a new cutting thence down into the old Bubastite canal, which they also cleared out and restored. But the extent of what may be called the Upper Nile trade with the Red Sea through Berenice and Myos Hormos seems to prove that this canal transit was never very efficient during the Roman occupation; and the inference is supported by the unnavigable state in which Amrou, the Arab conqueror, found the Babylon section in A.D. 622. This he re-opened, and for a time he managed to maintain communication with the Red Sea; but in less than a century and a half the unconquerable sand had reasserted its dominion, and thence on, for more than a thousand years, water-way between the two seas was closed.

Next in the historic order of its promoters comes Bonaparte, who during the French occupation of 1798–1801 ordered a survey of the Isthmus, with a view to the construction of a direct ship-canal from sea to sea. His engineers, however, declared the Mediterranean to be thirty feet below the level of the Red Sea, and recommended instead a complicated fresh-and-salt-water scheme



which the forced evacuation of the country, shortly after, happily prevented any attempt to carry out. During the next thirty years the question continued to be agitated at intervals; but nothing definite was done till 1830, when Lieut. Waghorn, then engaged in the establishment of his overland route, again surveyed the Isthmus and found the level of the two seas to be very nearly identical. The announcement of this fact called the attention of Mehemet Ali to an enterprise pregnant with such political advantages to Egypt, and he accordingly commissioned Linant Bey, the French engineer of the Barrage, to prepare the plan of a great ship-canal across the Isthmus at its narrowest point, from Tilreh (Pelusium) to Suez. This was done, but as M. Linant accepted the survey of Bonaparte's engineers in preference to that of Lieut. Waghorn, his scheme failed to secure the confidence of the Viceroy, and nothing further was done till 1846, when at the request of his Highness, England, France, and Austria appointed a Commission to solve, once for all, the problem of the sea levels. This Commission—on which Mr. Robert Stephenson represented our own Government—confirmed Waghorn's report, with the sole variance of finding a difference of five feet in the tidal levels of the two seas at the proposed termini of the canal. Another examination leading to similar results was made five years later; but Mr. Stephenson nevertheless pronounced against the feasibility of the canal, and his opinion—though at variance with that of M. Talabot, the French member of the Commission—being accepted by the Government and public of England, the railway from Cairo to Suez, which he recommended instead, was the result.

In the meantime, another mind had been occupied with the scheme for nearly a quarter of a century. When Waghorn was advocating his own peculiar enterprise of

an overland route, young Ferdinand de Lesseps was an *élève* in the French Consulate at Cairo, and, interested in our countrymen's settlement of the sea levels, he conceived the idea of accomplishing the great work which Napoleon had abandoned. For four-and-twenty years of active official life the idea kept firm hold of his imagination, until, being again in Egypt in 1854, he developed his plan to the then Viceroy, Saïd Pasha, and obtained from him a preliminary concession for a ship-canal across the Isthmus from a point near Pelusium to Suez. In the following year this project was submitted to another international Commission, which advised that, instead of striking the Mediterranean at Pelusium, the Canal should be carried through Lake Menzaleh, and enter the sea some seventeen miles farther west, where a deeper approach would be available. This and some other modifications having been accepted, the final concession for the work was signed by the Viceroy on January 5, 1856. Of the opposition which had already begun on the part of Lord Palmerston and the English press it is needless to speak, for is it not all written in Blue Books and journals innumerable? This, however, rather stimulated than discouraged M. de Lesseps, while it also stirred up the national feeling of France, and with its help enabled him, in 1858, to launch his "Compagnie Universelle du Canal Maritime de Suez," with a capital of 8,000,000*l.* in 20*l.* shares, on nearly every Bourse in Europe. Rather more than half this amount was subscribed for—the greater part in France—and eventually, in 1860, Saïd Pasha was induced to take up the remainder, amounting to 3,500,000*l.* Thus encouraged, and disregarding the withheld consent of the Porte—which was not finally given till 1866—M. de Lesseps and his little band commenced their historic work on April 25, 1859, by cutting a small trench in the narrow



belt of sand on the northern shore between Lake Menzaleh and the sea, where now stands Port Saïd. This was followed soon after by the establishment of working encampments at various points across the Isthmus, and by the restoration of the Wady canal from Zagazig to Lake Timsah, to provide a fresh-water supply for the thousands who were to be employed on the work. The initial difficulties were, however, so great, that by the end of 1862 only a narrow channel had been made from the Mediterranean to Lake Timsah—less than half-way across—and the fresh-water canal extended from Ras-el-Wady to the same point, whence it was carried, closely parallel to the ship-canal, on to Suez in the following year, when the Government also began the canal from Boulak, which, by joining the Wady canal at Ter-el-Kibeer, now completes the fresh-water communication between Cairo and Suez.

At this point arose a difficulty which for a time threatened to suspend, if not altogether to stop, the works. By the terms of the concession Saïd Pasha had engaged to furnish by *corvée* four-fifths of the workmen required, the Company agreeing to pay them at the rate of about two-thirds the price of such labour in Europe, besides providing them with rations and shelter. The objectionableness of this stipulation had from the first been urged on the Porte by the English Government, and soon after the death of Saïd Pasha, in January, 1863, Sir Henry Bulwer, then ambassador to the Porte, during a visit to Egypt, pressed it strongly on the present Khedive. The impolicy of thus drafting off 20,000 fellahs monthly from their proper work at home was made clear to Ismaïl Pasha, and accordingly, in the beginning of 1864, this large contingent of forced labour was refused. The political inexpediency of a foreign Company being allowed to hold, with almost sovereign rights, the wide belt of land along the

Canal conceded by Saïd to Lesseps, and of its owning absolutely the fresh-water canal, was at the same time recognized by his Highness. By consent of the parties, the difficulties arising on these various points were, in length, in 1864, submitted to the arbitration of the Emperor Napoleon, whose award in July of that year gave the Company the enormous indemnity of 3,360,000*l.*—being 1,520,000*l.* for the withdrawal of the fellah labour, 1,200,000*l.* for the resumption of the land along the Canal, except two hundred metres on each bank, and 640,000*l.* for the fresh-water canal from Ras-el-Wady to Suez—the whole to be paid in sixteen instalments of 12 per cent. Treasury bonds falling due between 1864 and 1879. To this was added, in 1866, a cash payment of 400,000*l.* for the re-purchase of the Wady domain, which the Company had bought five years before from Saïd Pasha for 74,000*l.* By a subsequent convention, the term for the payment of the indemnity awarded by the Emperor Napoleon was shortened by ten years, and it was agreed that the whole sum should be paid by 1869, which has since been done.

Thus financially reinforced, the Company was enabled to replace by machinery the hand labour taken from it by the stoppage of the *corvée*. Powerful steam dredges excavated more quickly, and in the end more cheaply, than the previous army of fellahs; and with the help of a still large force of European labourers and such native volunteers as could be procured, the work proceeded without interruption till the end of 1864, when financial difficulties again for a while checked its progress. These were, however, got over by a debenture loan for 6,666,660*l.*, issued at 60 per cent., and redeemable at par in fifty years by lottery drawings, with prizes amounting to 40,000*l.* a year. To this was added another issue for 1,200,000*l.* in 1869—



secured on twenty-five years' coupons of the Government shares, from January, 1870—when an arrangement was come to with the Government by which, for the further sums of 800,000*l.* and 400,000*l.*, the Company surrendered its remaining rights and privileges in connection with the fresh-water canal, and the riverain desert still belonging to it, and sold to the Government all its establishments on the Isthmus, its quarry and harbour at Mex, near Alexandria, and its workshops at Damietta and Boulak. The Government being unable at the time to pay this amount, it renounced for twenty-five years the coupons of its shares,\* and on the security of these the money was raised by a loan which is now being redeemed by the interest accruing upon them. The net capital of the Company had thus swelled from its original amount of 8,000,000*l.* to, in round figures, 17,000,000*l.*, which other various payments received during the progress of the work further raised to a total of nearly 19,000,000*l.*, the approximate final cost of the works, including payment of interest during construction. A glance at the details of the scheme will show that its difficulty and magnitude were fully commensurate with this great expenditure.

The total length of the Canal from sea to sea is eighty-six miles, with a varying width at the water-line of 328 feet where the banks are low, and of 190 feet in deep cuttings where they are high, depth twenty-six feet, width at the bottom seventy-two feet, with a slope of bank near the water-line of one in five, and near the base of one in two. With reference to the width of water-line and nature of the soil traversed, the whole channel may be divided into nine sections—(1) The low marshy plain extending for ten miles from the roadstead of Suez

\* These had originally been 177,642, but had at this date been reduced to 176,602.

to the plateau of Shaloof; in this section the water-line is of the full width, and much of the soil towards the bottom of the channel is of a mixed stiff clay and half-formed stone, which proved very difficult of excavation when worked through in 1868 and 1869. (2) The deep Shaloof cutting of five miles, in which the water-line is of the reduced width, and the soil sandy at top, but like that of the previous section strong and tenacious below; a deep layer of rock was encountered here in 1866, of which no less than 52,000 cubic yards had to be blasted and cleared away. (3) The Bitter Lakes, supposed to have anciently formed the Heröopolite Gulf, the waters of which, after being gradually cut off from the Red Sea, evaporated and left two large depressions of varying depth, but both much below the old sea-level. It is hereabouts that modern criticism places the scene of Pharaoh's overthrow during his pursuit of the Israelites. The only excavation done in this long section of twenty-five miles was a cutting through the narrow neck of soil between the two basins, and short entrances north and south; but the work of filling the vast expanse with water was one of considerable time and labour. This was begun in March, 1869, by letting in the waters of the Mediterranean, which had already filled Lake Timsah, eight miles north, and advanced through the Canal to the foot of the enormous weir destined to regulate their flow in these southern basins. A stream of nearly 5,000,000 cubic metres was then poured in daily, and three months later a still larger weir near Shaloof admitted the waters of the Red Sea into the southern portion of the lake at the rate of more than 10,000,000 cubic metres a day. Altogether, about 1,900 million cubic metres of water from the two seas were required to fill these Bitter Lakes. The course of the Canal through this great sheet