

ever persistently refused till 1861, when the Messageries Impériales Company appeared as rivals in the field of navigation east of the Gulf, and—French influence being then in the ascendant at Cairo—obtained almost in a month what had been denied to the English for nearly nineteen years. The maritime Canal had been begun, but even in France there were sceptics as to its success, and it was felt that in any event a graving dock at Suez would still be of use to the fleet of steamers with which the new Franco-Chinese mail service was to be carried on. A concession was accordingly obtained by the French Company from Saïd Pasha, for the construction of a dock at a cost of 7,000,000 frs., to be borne by the Egyptian Government, and in 1862 the work was begun by Messrs. Dussaud Frères, a well-known firm of French engineers, who had already executed similar works at Cherbourg and Marseilles, and who subsequently also made the harbour at Port Saïd. The point chosen for the new dock was at the head of the roadstead, about a couple of miles south of the town, where a space was dredged sufficient to give an enclosed area of 410 ft. long, by 90 ft. wide, with a depth of 36 ft.—on an axis WSW., and ENE.—the excavated soil of which, deposited round it, soon hardened into good ground with a surface a metre above high-water mark, for the pumping engine-house and the other necessary buildings. The enclosing walls and entrance piers, 80 ft. apart, are of the most solid masonry, and the length of the dock can be reduced to 390 ft. by means of a massive shifting caisson which forms the outer gate. During the progress of the work the contractors received from the Government a further sum of 1,500,000 frs., in commutation of native forced labour which was to have been supplied by it, to which a few other small amounts were also added,

raising the total cost of the undertaking to about 350,000*l.* The dock was opened in 1866, and it was then intended merely to add to it a line of quays right and left of its entrance, respectively for the use of Government and merchant ships; but in view of a large expected increase in the local trade, the Viceroy decided in constructing a complete artificial harbour large enough to provide for any eventuality. Messrs. Dussaud accordingly designed a port capable of indefinite extension, and, after some delay, the new further works on this were begun in 1870. These comprise a large outer basin (now called Port Ibrahim), divided by a broad and massively-built mole, 1,700 ft. long, into two sections, one for men-of-war and the other for commercial shipping, and quays running north and south—enclosing altogether an area of more than 100 acres of water surface, with a minimum depth of 23 ft., and a total quay frontage of 10,500 ft., alongside which nearly thirty of the largest ships may load or discharge at one time. The rapid success, however, of the Canal having almost destroyed the transit trade of Suez, the works were suspended in 1875, leaving the full scheme incomplete, but with finished accommodation more than sufficient to meet all the probable wants of the port for some years to come. A branch railway, which delivers and takes up passengers and cargo in a covered station close to the moorings of the P. & O. steamers, connects the whole with Suez, running along a raised stone-faced embankment, which also supports a good carriage road. As yet, no harbour dues are charged to vessels using either the basins or the quays, but for the graving-dock, a charge is made of 70*l.* for the first, and half that amount for each subsequent day of its occupation. This covers nothing but the use of the dock, and assistance in placing the ship on the blocks; and, unless her own re-

sources suffice for the repairs needed, both materials and skilled labour must as a rule be brought from Alexandria. The entrances to both the wet and dry docks are clear and easy, the former being accessible at all times of the tide, and, to vessels under steam, in any weather. Considerable inconvenience is occasioned by the retention of the Custom-house up at the town of Suez, to which all cargo for Egyptian use has still to be transported as of old in lighters for examination, only through goods and the mails being discharged into the railway trucks for conveyance to Alexandria, where they are re-shipped under Customs supervision. The total cost of these works, including that of the dry dock, has already exceeded 1,400,000*l*.

LIGHTHOUSES.

In respect of these important aids to navigation Egypt now compares favourably with the best lighted seaboard of Europe. And here again, with one exception, the present reign is to be credited with the whole of the existing admirable system. At the death of Saïd Pasha the lighthouse at Alexandria, which has since received a new lantern and been otherwise improved, was the only structure of its kind on any part of the Egyptian coast, while an inefficient floating-light in the bay of Suez was the sole beacon on the western side of the Red Sea; there are now eight powerful lights on the Mediterranean coast, and seven on the Red Sea. Of the former, four serve the harbour and bay of Alexandria—one, the fine 20-second revolving light on Ras-el-Teen Point, visible for twenty miles; close by, at the end at the breakwater, a red light, visible for six miles; a third on Marabout Island, at the western extremity of the bay; and, beyond that, the fourth, also a fixed first-class light, in the Arab's Gulf. Eastwards, off

Rosetta, is a fine flashing red-and-white light; at Cape Bourlos, a fixed white one; off Damietta, a flashing white light; and at Port Saïd, in addition to the small coloured beacon at the extremity of the two harbour-moles, a first-class electric 20-second light, visible twenty miles off. On the Red Sea, besides the white light at the entrance to the Suez Canal and the floating beacon in the Suez roads, a powerful eighteen-mile light has been erected off that harbour; a second, a fixed white light, visible fourteen miles off, on Zafarana Point, fifty miles south of Suez; the third, a similar but more powerful light, on Ras Gharib, fifty miles still lower down; a fourth, on Jubal Island, at the mouth of the Gulf, is a 60-second revolving light, visible for eighteen miles; a fifth, on the Dædalus reef, nearly in the middle of the Red Sea, in lat. 24° 55' N., is a fixed second-class light, visible fourteen miles off; a sixth, of similar power, at Souakim; and a seventh at Berbera, on the Indian Ocean. On the eastern coast also, below Suez, a new light has been erected at El-Wedge, the quarantine station for vessels arriving from Red Sea ports. The total cost of the fourteen of these lights erected during the present reign is estimated at 187,964*l*. The whole are of the best European construction, and their keepers are for the most part Englishmen. The light-dues—of 2*p*. (4·922*d*.) per ton up to 800 tons (Turkish measurement), and of 1*p*. per ton beyond that capacity—afford, since the great increase in the traffic through the Red Sea consequent on the opening of the Suez Canal, a revenue considerably in excess of the cost of the service, and might therefore be reasonably readjusted in favour of Canal-going ships, which pay this high rate on both their upward and downward voyages, whereas vessels from the southward, which proceed no farther than Suez, and return thence, pay

only once for the double trip. A reduction of 5 per cent is made in favour of regular postal steamers, and men-of-war are wholly exempt, as are also small craft of less than ten tons burthen. Few, however, will grudge the Government a liberal margin of profit, as on perhaps no part of the coasts of Europe is the light service more efficient than on these northern and eastern shores of Egypt—a result which is chiefly due to the energy and intelligence of our countryman, McKillop Pasha, under whose superintendence most of the lights were erected, and who now manages the whole.

TELEGRAPHS.

Like its railways, the telegraphs of Egypt are mainly the creation of the present reign. At the death of Saïd Pasha only six short lines, measuring in all about 350 miles, were in existence. There are now, including three private lines worked under concessions granted by the Government, thirty-six, spanning more than 5,500 miles, with nearly 10,400 miles of wire. It is true that, except in Lower Egypt, this great extension of the system represents rather increased administrative facilities than a proportionate growth in commercial and general correspondence; but even in the Middle and Upper provinces the statistics of the department show an increase of nearly 34 per cent. in the non-Government traffic during 1875 as compared with that of 1869, while below Cairo the development has been much greater. Subjoined is a list of the present network:—

Lower Egypt.

	No. of Wires.	Mileage.
Cairo to Alexandria	7	142
Cairo suburban lines	2	32
Cairo to Helwân	1	18
Cairo to Galioub and the Barrage	2	17

	No. of Wires.	Mileage.
Cairo to Teh-el-Barood	1	71
Cairo to Gaza (Syria) <i>via</i> Benha	2	288
Cairo to Suez	1	154
Cairo to Mansourah, <i>via</i> Galioub	2	96
Aboukebir to Salahieh	2	25
Benha to Mit-birra	2	9
Benha to Zagazig and Suez	2	123
Tanta to Talka and Damietta... ..	2	73
Tanta to Zifta	2	33
Tanta to Dessouk	2	47
Tanta to Shibin-el-Koom	2	19
Nashart to Kafer Sheikh	2	10
Alexandria suburban lines	2	12
Alexandria to Rosetta	2	46
Damanhour to Atfeh and Rosetta	2	50
Port Saïd to Suez (direct)	1	96
Port Saïd to Kantara	1	26

Middle and Upper Egypt.

Cairo to Assiout	3	239
Wasta to the Fayoum	2	25
Bibba to Rhoda	2	91
Assiout to Abou Teck	2	5
Assiout to Assouan	2	300
Kenneh to Cosseir	2	164
Assouan to Khartoum*... ..	2	1,012
Berber to Kassala	1	407
Kassala to Massowah	1	447
Kassala to Souakim	1	300
Khartoum to Kordofan (El Obed)	1	407
Khartoum to Messalamia and Sennaar	1	162

The system thus outlined supplies telegraphic communication to every considerable town, and even to most of the larger villages in Egypt proper, and, southwards, to all the chief Government and trading stations from

* This great line, which through much of its course traverses deserts and forests previously unexplored, was constructed by Mr. Hartley Gisborne and a small assistant staff of English engineers.

Assouan to the countries bordering the Blue and White Niles. The whole network is divided into eight "sections," the first of which includes all stations in Lower Egypt, the second those between Cairo and Assiout, the third between Assiout and Esneh, the fourth between Esneh and Wady-Halfa, the fifth between Wady-Halfa and Dongola, the sixth between Dongola and Berber, the seventh between Berber and Khartoum, and the eighth between Khartoum and Massowah. The tariff charge for a single message of twenty words, including the address, is 10 piastres for each section. Arabic is the language employed on all lines south of Cairo, but in Lower Egypt English, French, Italian, and Turkish are also in common use. Except for the special railway wires, which are worked by the old needle instrument, the Morse ink-recorder is the apparatus generally employed. This service is also under English management, with Mr. George as director and Mr. Gisborne as engineer.

Besides these Government lines, the Eastern Telegraph Company has been allowed to construct and work two lines between Alexandria and Suez for its through Red Sea service, one *viâ* Cairo and the old desert route, and the other *viâ* Benha and Zagazig, both double-wire lines, and respectively 233 and 229 miles in length. The Suez Canal Company also works, for the purposes of its own administration, a line along the Canal 96 miles long. Externally Egypt is in telegraphic communication with Europe by the land line through Syria and Asia Minor to Constantinople, and by the Eastern Company's cables—(1) from Alexandria to Constantinople *viâ* Candia, Rhodes, and Smyrna; (2) from Alexandria *viâ* Candia and Zante to Otranto; (3) from Alexandria to Italy *viâ* Malta and Sicily; (4) from Alexandria to England *viâ* Malta, Gibraltar, Lisbon, and Porthcurno (Cornwall);

and (5) from Alexandria to France *viâ* Malta, Bona, and Marseilles; and with India, China, the Straits, Australia, and New Zealand, by the same Company's Red Sea and extreme eastern cables. Another submarine line to Europe is also projected—from Alexandria *viâ* Candia and the Piræus.

BRIDGES.

Besides nearly 500 smaller works of this class built over various canals, six or eight large ones have also been constructed during the present reign. The most important of these is the monumental iron structure over the Nile at Cairo, which has replaced the old rickety ferry that a dozen years ago contributed so much to the picturesque and the inconvenience of an excursion to the Pyramids. This splendid bridge spans the river from Kasr-en-Nil to Gizereh with a level macadamised roadway, 40 metres wide and 406 in length. Its first section on the Cairo side opens on a central pivot, and twice in the twenty-four hours affords a double up and down waterway 32 metres wide, with an average depth of 10 metres; the remainder of the bridge consists of seven spans, the first and last of which are 46 metres, and the intermediate five 50 metres long, the whole resting on massive circular piles, foundationed on concrete. This fine work was completed in February, 1872, by the French company of Fives-Lille, at a cost of 108,000*l.*

Gizereh, as its name imports, was formerly an island, but some years ago the passage between it and Ghizeh, on the Libyan bank of the river, was closed by a broad embankment, and the entire stream turned into the eastern channel. But the great volume of water thus forced against the right bank gradually so encroached upon it as to threaten to undermine the river front of

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.