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Author(s): Joseph Rabino

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The STATISTICAL STORY of the SUEZ CANAL.

By JOSEPH RABINO, ESQ.

[Read before the Royal Statistical Society, 14th June, 1887.]

SIR RAWSON W. RAWSON, K.C.M.G., C.B., a Past President in the Chair.]

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I.—The Importance of the Canal.

IN studying the economical situation of Egypt, we were¹ met at every stage of our inquiry by the cardinal fact that to Nature's great waterway, the Nile, is due not only the prosperity of the land, but even the very existence of its people.

Shakspeare places the idea vividly before us :—

“ 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 foison 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.”

Antony and Cleopatra, act ii, scene vii.

The external or international importance of Egypt depends at present in a scarcely lesser degree upon that other waterway which we owe to the energy and perseverance of him whom our neighbours with pardonable pride entitle “the great Frenchman.”

How great that importance is to us may be imagined from the circumstance that, with the almost unanimous approval of the country, an administration pledged to peace and retrenchment did not hesitate in confronting the risks and sacrifices of war rather than allow the canal to fall into unfriendly hands.

Indeed the question of the canal touches, or is supposed to touch that of our naval supremacy, a point of our national policy which already three centuries back was put forth by Bacon as an indisputable axiom :—

¹ See paper on the Statistics of Egypt, September, 1884, of this *Journal*.

"But this much is certain," says he; "that he that commands the sea is at great liberty, and may take as much and as little of the war as he will; whereas those that be strongest on land are many times, nevertheless, in great straits. Surely, at this day, with us of Europe the vantage of strength at sea (which is one of the principal dowries of the kingdom of Great Britain) is great; both because most of the kingdoms of Europe are not merely inland, but girt with the sea most part of their compass; and because the wealth of both Indies seems, in great part, but an accessory to the command of the sea."²

Nor do other nations overlook the political importance of the canal, which since its construction has been the subject of arduous diplomatic negotiations and the status of which is a problem in every European chancellerie.

M. Renan in his answer to the Academy speech of M. de Lesseps, thus eloquently points to one possible consequence of the construction of the canal:—

"The great saying: 'I come not to bring peace but a sword,' must often have presented itself to your mind. The isthmus cut becomes a strait, that is, a battlefield. A single Bosphorus had hitherto sufficed for the troubles of the world; you have created a second much more important than the other, for not only does it unite two portions of inland sea, but it serves as a channel of communication with all the great oceans of the globe. In case of naval war it would be the supreme interest, the point for the occupation of which the whole world would struggle to be first. You will thus have marked the field of the great battles of the future."³

Of the commercial importance of the canal I shall speak hereafter, believing that I have sufficiently justified my opinion, that some account from a statistical point of view of this great undertaking may fitly find a place in the annals of our Society.

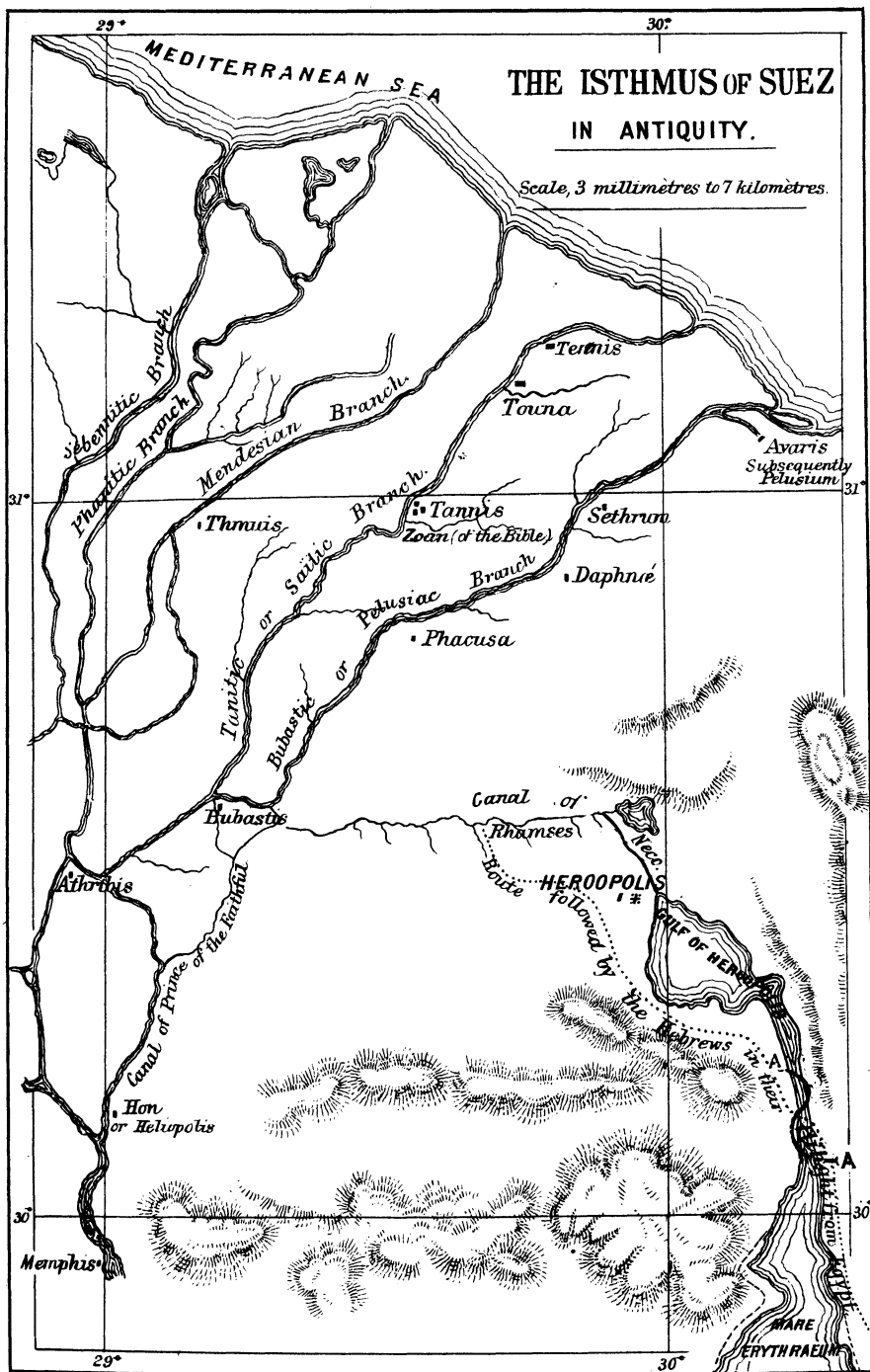
II.—*The Forerunners of the Canal.*

From Suez on the Red Sea to Port Saïd on the Mediterranean the distance as the crow flies is less than 100 miles; about as far as from London to Leicester, and a sharp two hours' run in one of our express trains.⁴ A canal cut through this short distance—rendered shorter by the existence of lagoons and deep depressions throughout its length—brings the Mediterranean countries 12,000 miles nearer by sea to the producing regions of the East, and

² "Of the true greatness of kingdoms and estates."—Bacon's "Essays."

³ "Le Temps," 24th April, 1885.

⁴ King's Cross to Grantham, 105½ miles, 2 h. 4 m. (1883). St. Pancras to Leicester, 99¼ miles, 2 h. 7 m. (1883).—*Statistical Journal*, June, 1884.



AA.—THIS PASSAGE BECAME CHOKED UP IN VERY ANCIENT TIMES, THE GULF OF HEROOPOLIS BEING THUS CONVERTED INTO A LAKE. ARTIFICIAL COMMUNICATION WAS AT VARIOUS TIMES ESTABLISHED BY A CANAL AA (FREQUENTLY DESTROYED BY TIME) CALLED THE CANAL OF DARIUS, OF THE PHARAONS AND OF TRAJAN. THIS FINALLY DISAPPEARED IN THE EIGHTH CENTURY.

Harrison & Sons. Lith. S. Martins Lane. W.C.

gives them access to markets prized and coveted since commerce first began.

The wonder is then, not that a man of genius and enterprise should have been found in this nineteenth century of ours to plan and carry out the canal scheme, but that such a canal should not have been made and maintained centuries since.

And indeed nature first showed the way: the low level of the isthmus, the salt marshes and deposits, the shells and fossils identical with existing species in the Red Sea, clearly point to the conclusion that the belief of the priests of ancient Egypt, in the former union of the Mediterranean and the Red Sea, was either a sound scientific hypothesis, or the half effaced recollections of an historical fact.⁵

Herodotus⁶ tells us that from Mount Casius—identified as a sandy headland on the Mediterranean—to the Gulf of Heroopolis the distance was 1,000 stades. This would bring the Red Sea nearly 40 miles further north than at the present day, and the site now occupied by the bitter lakes, perhaps even by Lake Timsah, must have been its extreme limit.

A glance at the accompanying sketch map will make this clear. It will be seen that between the Gulf of Heroopolis (now bitter lakes) and the Red Sea a narrow channel connected the waters; this channel seems to have been closed by an upheaval of the soil, which at the spot now called Chalouf presents hard rock of the tertiary formation.⁷

The first attempt at a canal is attributed to Neco the son of Psammiticus,⁸ who connected the Gulf of Heroopolis with the Pelusiatic branch of the Nile at Bubastis (Zagazig). At the southern end of the gulf (bitter lakes), the channel being choked up, goods were landed and carried onward to the Red Sea.

Darius is said to have completed Neco's work by digging a canal along the line of the ancient junction of the Gulf of Heroopolis with the Red Sea.

⁵ "There is evidence that the country round the northern end of the Red Sea "has been raised above its former level within the last three thousand years. "Caverns are found in the cliffs of the Red Sea and in those more inland on the "Arabian coast, and the whole desert from Suez to Cairo is covered with "abundance of shells similar to those now living in the Red Sea, which was "probably joined to the Mediterranean at a very recent period."—Somerville's "Physical Geography," chap. vii.

⁶ Book ii, secs. 159 and 160. Cary's translation.

⁷ It is interesting to remark that the caravan track to Mecca crosses the isthmus some miles south of this point, and there seems every probability that it is identical with the route followed by the Israelites in their exodus from Egypt. A strong east wind would have enabled them to cross the sea bed dryshod, whilst a rapidly rising tide would within a short time have covered the passage with 6 feet of water. The report of the Egypt Exploration Fund treats this question.

⁸ Herodotus, book ii, secs. 159 and 160. Cary's translation.

Centuries later these canals having become obstructed and useless, the Romans restored them, giving the whole the name of Trajan's canal. This likewise seems to have been in existence but a short time, and it is a controverted point whether Cleopatra's galleys were able or not to pass through it.

The last attempt at a passage from the Red Sea to the Nile was made by Amru ibn el Aas, the general of the Caliph Omar, who conquered Egypt in the seventh century. A great famine reigning in Mecca, Amru was ordered to take measures for forwarding thenceforth grain from Egypt by the quickest route. "He dug a canal of communication from the Nile to the Red Sea, a distance of 80 miles, by which provisions might be conveyed to the Arabian shores. This canal had been commenced by Trajan the Roman emperor."⁹

The Pelusiatic arm of the Nile being no longer navigable, he however joined his canal to the river at Cairo instead of Bubastis or Zagazig. This occurred in the year of the great mortality A.D. 639, and no later than in 767 the Caliph Abou Giaffar el Mansour, to prevent food being sent to the insurgents of Medina, caused the canal to be destroyed by filling up the junction of Neco's canal and the bitter lakes. The winds and the sands did the rest, and produced the ridge of Serapeum, which probably covers the site of the ancient city of Heropolis.

From this period to the beginning of the present century, save for half hearted projects of the Venetians, and later of the Porte itself, we hear no more of the question till Napoleon invaded Egypt, and ordered an immediate survey of the isthmus with a view to the establishment of a maritime canal.

The chief engineer of the survey, M. Lépère, in his remarkable report on the subject,¹⁰ offers a solution of the problem differing very little from those of the ancients, whose principal objections to a direct canal he frankly adopts. He joins his canal to the Nile, and completes it by a canal from Rahmanieh to Alexandria—almost identical with the present Mahmoudieh Canal, which supplies Egypt's northern seaport with fresh water.

The salient point of the various canals we have mentioned is that they all evade the problem of a direct passage from sea to sea. Putting on one side the fact that the object originally sought was rather a trade between the interior of Egypt and Arabia than a through passage with the north, the real obstacles were the following, which have been proved by experience to be unfounded:—

First, the theory that the Red Sea is at a higher level than the

⁹ Washington Irving's "Successors of Mahomet."

¹⁰ "Memoire sur le Canal des deux Mers." "Description de l'Egypte," vol. xi.

Mediterranean, and to bring its waters inland would be to submerge a great part of the country, and injure the Nile water. This error was perpetuated by Napoleon's engineers, as M. Lépère declared the result of his experiments to be that the Red Sea level was 30 feet above the Mediterranean.¹¹ In 1847 only was the matter set finally at rest by a commission composed of Signor Nigrelli, Mr. Robert Stephenson, and M. Talabot, on the part of the Austrian, English, and French Governments, who reported that there was no difference of level between the two seas.

Second, the fear of the dangers of navigation in the Red Sea, a fear probably born of the primitive means at the disposal of the Arabs during the last few centuries: they had not even the mariner's compass.

Third, the theory that the prevalence of westerly winds on the south Mediterranean coast, and the constantly increasing deposits of the Nile, would render the establishment of a port impracticable.¹² This objection was removed by the observations of the officers of the corvette "Yand Becker," which, by order of the French government, remained at anchor during the winter months of 1857 three miles off the coast.

These objections, which now appear so futile, were sufficiently serious to delay any attempt at a maritime canal till M. de Lesseps took the matter in hand, and settled the difficulty somewhat in the fashion of Columbus with the egg.

Having thus passed in review the different attempts at a waterway through Egypt, we must not omit some mention of our countryman, Lieutenant Waghorn, the real pioneer of our short cut to India.

This remarkable man made it the task of his life to establish and improve the route to India by the isthmus. Undeterred by the scoffs of opponents, and the steady official discouragement of the East Indian and Home authorities, he, by his personal and almost unaided efforts, started steamers from Alexandria to the Nile, established stations and hotels in the desert from Cairo to

¹¹ "It is therefore certain from the examination of these results, that the waters of the Red Sea are susceptible of covering the lands of the Delta, and that the fears of this submersion among the ancients were only too well founded in those remote times when the Delta and the bed itself of the Nile were incon- testably less elevated."—"Description de l'Egypte," vol. xi.

¹² "It is but too certain that a permanent establishment along any part of the sea front of the Delta could with difficulty be made, as this coast is an alluvial soil, which rises and increases constantly through the new deposits of mud accumulated there by the Nile in its rises, and that the access of this shore is always dangerous; the wrecks which are but too frequent there justify sufficiently the fear of shoals not less to be dreaded by sailors than the bogház or mouths of the Nile."—*Idem*.

Suez, and showed the practicability of his theory by taking for a long time personal charge of the mails, till, on the 31st October, 1845, he had the satisfaction of bringing letters into Bombay only thirty days old. In his first attempts, with every circumstance against him, he was nevertheless never beaten in his race against time. So energetic was he that on one occasion, having missed the Bombay steamer, he embarked in an open boat, without chart or compass, to sail along 600 miles of the Red Sea from Suez to Jeddah, and in six days and a half accomplished the feat.

The impression that his wonderful activity made upon his contemporaries is thus humorously hit off by Thackeray: "The bells are ringing prodigiously; and Lieutenant Waghorn is bouncing in and out of the courtyard full of business. He only left Bombay yesterday morning, was seen in the Red Sea on Tuesday, is engaged to dinner this afternoon in the Regent's Park, and (as it is about two minutes since I saw him in the courtyard) I make no doubt he is by this time at Alexandria or at Malta, say, perhaps at both. *Il en est capable*. If any man can be at two places at once (which I don't believe or deny) Waghorn is he."¹³

The Suez Canal Company have gracefully acknowledged their obligations to Lieutenant Waghorn by erecting a bust to his memory on the Peninsular and Oriental quay at Suez, which is named after him.

III.—*The Digging of the Canal.*

Said Pacha ascended the vice-regal throne in 1854, and M. de Lesseps, who was on terms of intimacy with this prince, profited by this circumstance to bring forward his plan for a ship canal across the isthmus. An Act of concession, dated the 30th of November of that year, was granted him, which was followed on the 5th of January, 1856, by a second Act in amplification and completion of the first. To this Act were annexed the articles of association of a company for working the concession, and these two documents form the Charter of the Suez Canal Company.

Based on the French railway concessions,¹⁴ the company's charter gives it a ninety-nine years' lease (to count from the opening of the canal) for digging and working:—

- 1°. A maritime canal from sea to sea, with a northern port on the Mediterranean, and an inland port at Lake Timsah, and improving Suez harbour.

¹³ "A Journey from Cornhill to Cairo."

¹⁴ "Percement de l'Isthme de Suez. Actes Constitutifs," &c., &c., published by M. F. de Lesseps in the name of the Board of Directors. Paris, 1866.

- 2°. A freshwater canal from Cairo to Lake Timsah, with branches north and south supplying the two canal sea-ports.

For the carrying out of this undertaking the government granted the company:—

- 1°. The lands necessary for the company's buildings, offices, and works on the canal, gratuitously, and free from taxation.
- 2°. The lands, not private property, brought under cultivation by the construction of the fresh water canal, gratuitously, and free from taxation for ten years.
- 3°. The right to charge landowners for the use of the water of the fresh water canal, which, on the other hand, it was bound to supply.
- 4°. All mines found on the company's lands, and the right to extract from all State mines and quarries, free of cost, royalty, or tax, the stone, plaster, or other materials required for the construction of the canal and ports.
- 5°. Freedom from duties on its imports.

The canal and works were to be finished, save for unavoidable delays, within six years. Native labour was to be employed to the extent of four-fifths of the whole, a special convention settling the terms on which the Government supplied or authorised such labour.

The tolls were fixed at 10 frs. per "ton of capacity" (an expression which gave rise to difficulties subsequently), and 10 frs. for each passenger.¹⁵

The company was declared to be Egyptian, and subject therefore to the local jurisdiction.

The profits were to be thus divided, after payment of 5 per cent. interest to shareholders, and 5 per cent. to reserve fund:—

15 per cent.	to the Egyptian Government.
10	„ founders.
75	„ shareholders, directors, and staff.

At the expiration of the ninety-nine years the canal and appurtenances were to revert to the Egyptian Government, the company retaining its plant (*matériel*) and stores.

¹⁵ The exact order of charges is as follows:—

- 1°. Maintenance and charges of society.
- 2°. Interest and sinking fund of loans.
- 3°. Five per cent. to shareholders (the interest on redeemed shares to sinking fund).
- 4°. Four hundredths per cent. on capital to sinking fund.
- 5°. Reserve fund for unforeseen expenses, and finally dividends.

Armed with these powers M. de Lesseps started his Canal Company, which was incorporated in December, 1858.

The capital was fixed at 200 million frs., or 8 million £, divided into 40 thousand shares of 500 frs., or 20*l*. Interest at the rate of 5 per cent. per annum was to be paid to the shareholders, and, the concession being terminable in ninety-nine years, a sinking fund of 0·04 per cent. (say four-hundredths per cent.) applicable to the share capital was decided upon, to be a first charge on the profits available for distribution.

On 25th April, 1859, the first sod of the canal was turned; but two years were spent in preparations, survey of the track, organisation of the work gangs, building of storehouses, purchase of dredgers, machinery, and tools, and accumulation of stores, timber, iron, lime, cement, provisions, &c., &c.

The company at first decided to entrust M. Hardon with the carrying out of the works, receiving 60 per cent. of the profits on the prices fixed by the original estimates of the International Commission, and reserving to itself merely the general superintendence, the drawing up of the plans, and the furnishing of machinery and stores.

This method was found not to work well, and the agreement with M. Hardon was subsequently cancelled, an indemnity being paid to him of 72,000*l*.

The company next undertook the works for its own account, but eventually entered into agreements with four contracting firms, who engaged to carry out portions of the works at the following prices:—

Contracts for Works on Suez Canal.

Dussaud frères, Marseilles.	Aiton, Glasgow.	Couvreux, Paris.	Borel and Levalley, Paris.
20th October, 1863.	13th January, 1864.	1st October, 1863.	1st April, 1864.
250,000 blocks of artificial stone of 1 cubic metre each (35½ cubic feet) and weighing 20 tons, @ 40 frs. each 10,000,000 frs. 400,000 <i>l</i> .	21,700,000 cubic metres of excavations @ 1·35 fr. The plant ceded to the contractor by the company brings the price up to 1·60 fr. 34,720,000 frs. 1,388,800 <i>l</i> . Contract afterwards cancelled, and transferred to Borel and Levalley	9,000,000 cubic metres of excavations @ 1·60 fr. 14,000,000 frs. 560,000 <i>l</i> . Enlargement and deepening of the great El Guisr trench, over 8 miles long	24,500,000 cubic metres of excavations @ 2·28 frs. 56,000,000 frs. 2,240,000 <i>l</i> . Continuation and completion of 53 miles of cutting from Lake Timsah to Red Sea. <i>Second contract.</i> Transfer of Aiton's contract

The most urgent of the tasks to be attempted were the settlement of Port Said and creation of the port, the freshwater canal for supplying the labourers' wants throughout the isthmus, and the trench through the ridge of El Guisr, the first serious obstacle on the line of the canal.

The further progress of the works would require a long and detailed description, which might be found tedious, and would certainly exceed the limits of this paper; I have therefore drawn up the following table¹⁶ in diary form, and with almost telegraphic laconism, which I hope will be found to give a sufficiently clear, though necessarily a rough and imperfect idea of the construction of the canal.

Progress of the Works.

1861.

PORT SAID.—2,000 inhabitants; houses for Europeans; Arab village; steam sawmills; forges and workshops for adjusting and fitting machinery; water condensers erected; dock basins; quarries of Mex worked. Tonnage of the port to 15th April—vessels, 135; tons, 29,000.

MARITIME CANAL—*General Works.*—Wells dug along line of works. In the summer of 1860, 1,200 natives opened a cutting from Lake Maxamah, bringing Nile water to Bir Abou Ballah, whence hydraulic apparatus carry it to El Ferdane at the foot of El Guisr.

North of Lake Timsah.—Sheds for 10,000 labourers, 13,800 wheelbarrows, 20,000 planks; steam sawmills.

South of Lake Timsah.—Nil.

FRESHWATER CANAL AND WATER SUPPLY.—A canal joining the Nile to Lake Timsah planned (*viâ Zagazig*); 3,000 labourers set to work.

1861-62.

PORT SAID.—Commencement of Eastern Mole; construction of landing stage, 70 yards by 22, in 16 feet of water, and about a mile from shore; service canal; arsenal dock at this period 160 yards by 135; depth, 5 feet. Tonnage of the port, March, 1861, to 1st March, 1862—vessels, 260; tons, 40,000.

MARITIME CANAL—*General Works.*—Buildings erected, square yards, 44,500; seven Arab villages (gourbis) 14,750; 24 dredgers ordered in Europe from various makers arrived at Port Said.

North of Lake Timsah.—Sea water cutting, 4 feet draught, 24 feet wide at water line, continued from Kantara to El Ferdane, allowing of transport to foot of El Guisr.

¹⁶ Compiled from "L'Isthme de Suez, 1854-69, avec cartes et pièces justificatives," par H. Silvestre. Paris, 1869. A clever and useful little book.

South of Lake Timsah.—Nil.

FRESHWATER CANAL AND WATER SUPPLY.—Canal brought to Lake Timsah, $21\frac{3}{4}$ miles; width, water line, 41 feet, bottom 25 feet.

1862-63.

PORT SAID.—Four dredgers, with cranes at work.

MARITIME CANAL—*General Works.*—Second sea water cutting for service of works, 50 feet wide, 3 to 6 feet deep, from Port Said to El Ferdane. Buildings along isthmus: March, 1862, 56,500 square yards; April, 1863, 96,500 square yards.

North of Lake Timsah.—18,000 men at work since November, 1862; trench 50 feet by 4 to 6 feet deep, connecting Mediterranean and Lake Timsah; 4,350,000 cubic metres (153,600,000 cubic feet) at 0.68 frs. the cubic metre, being within the original estimate, despite the labour of carrying the earth up an incline of 70 feet.

South of Lake Timsah.—From Lake Timsah to Toussoum plateau, canal 190 feet wide and 6 feet below the Mediterranean level, 21,200,000 cubic feet; 21 dredgers at work; 3 dredgers nearly ready, raising each over 353,000 cubic feet per month; 20 other dredgers to be established, raising each 1,050,000 cubic feet.

FRESHWATER CANAL AND WATER SUPPLY.—Canal from Nefiche to Suez begun; 24 miles finished, 64 feet wide at water line, 26 feet at bottom, 6 feet draught of water; cubic feet about 50,000,000.

1863-64.

PORT SAID.—Large tract of land reclaimed, area 142,000 yards, to establish works of Compagnie des forges et chantiers de la Méditerranée and those of E. Gouin of Paris; 20 new dredgers, with barges and accessories fitted up; landing stage lengthened 330 feet; about 600 feet quays finished; canal Cheikh Carpouti, 2,000 feet (subsequently 3,300), connecting port with shore of lake and Damietta, and assuring draught of water. Tonnage of port, year 1863, vessels, 295; tons, 48,759.

MARITIME CANAL—*General Works.*—Total area built over, 128,000 square yards.

North of Lake Timsah.—Excavations from Port Said to El Ferdane, 43,000,000 cubic feet; excavation of gypseous stone along Lake Ballah, 4,500,000 cubic feet.

South of Lake Timsah.—Maritime canal lengthened 4 miles; between Timsah and Serapeum excavations 7,600,000 cubic feet; two cuttings, the one to the Southwater Canal, Ismailia, and the second, east of Lake Timsah to a stone quarry at the Plateau of Hyenas.

FRESHWATER CANAL AND WATER SUPPLY.—Canal completed from Nefiche to the sea over 55 miles; had taken thirteen months; 118,000,000 cubic feet.

1864.

PORT SAID.—530,000 cubic feet of stone taken from the quarries at Mex (Alexandria), for the Port Said quays and embankments; Dussaud frères establish their plant for manufacture and submersion of artificial stone for moles. Tonnage of port, January—July, 1864, vessels, 124; tons, 35,220.

MARITIME CANAL—*General Works.*—Telegraph system finished; 13,000 natives at work first three months only; Borel and Levalley, who afterwards carried out such vast operations, employed in planning their work.

North of Lake Timsah.—Port Said to Timsah; excavation of natives, 23,000,000 cubic feet; Aiton's excavations (with company's plant) Port Said, 1,050,000 cubic feet; in the canal, 8,100,000 cubic feet; Couvreux' excavation, 2,200,000, using 2 excavators, 4 miles of railway, 4 engines, and 30 trucks.

South of Lake Timsah.—South of Chalouf; excavation of natives, 48,000,000 cubic feet; transverse canal to Serapeum, 3,200,000 cubic feet; transverse canal to Chalouf, 425,000 cubic feet.

FRESHWATER CANAL AND WATER SUPPLY.—Junction at Ismailia, 1,300,000 cubic feet; water supplied, Port Said, from 10th April; reservoir, plateau of El Guisr, 110,000 gallons; reservoir, Port Said, 154,000 gallons.

1864-66.

PORT SAID.—Plan of harbour modified; instead of two parallel moles, 1,300 feet apart, eastern mole started from shore at a distance of 4,500 feet from western mole, gradually approaching to 1,300 feet, and thus forming a fine port; pass of Port Said 200 to 300 feet wide, 16 feet deep; entry of basin 600 feet wide, 16 to 20 feet deep. Tonnage of port, 15th July, 1865, to 15th June, 1866; vessels, 595; tons, 108,539.

MARITIME CANAL—*General Works.*—Borel and Levalley; 32 long trough dredgers at work along 35 miles of canal; native contingents abolished, May, 1864, replaced with almost no delay; in 1866, 7,954 European labourers; 10,806 Africans and Asiatics, viz., Arabs, Syrians, &c.

North of Lake Timsah.—Canal from Port Said to Timsah widened to 325 feet, thus allowing formation of strands for the protection of banks from passing vessels, and economising stone embankments; El Guisr ridge trench widened and deepened by Couvreux, 6 miles, by Gioja, on account of company.

South of Lake Timsah.—Timsah to Suez; first excavations by hand, afterwards by dredgers from Timsah to south of Toussoum; from Toussoum to Bitter Lakes trench opened 5 miles; rock of Chalouf removed, 1,100 feet long; earth, 3,200,000 cubic feet; stone, 1,000,000 cubic feet.

FRESHWATER CANAL AND WATER SUPPLY.—Viceroy set 80,000 men to work at canal from Cairo to Wady; 5th October, 1865, 70,000,000 cubic feet; subsequently, 105,000,000; leaving 70,000,000; allowing of the passage of Nile water in all seasons; the company had finished 30,750,000 cubic feet, placed to its charge by the imperial award.

1866-67.

PORT SAID.—Western mole, 2,350 yards out of 2,700, of which 2,050 above water and 300 to water edge, to an extreme depth of $28\frac{1}{2}$ feet; eastern mole, over 1,000 yards out of 1,950, depth of about 18 feet; out of 250,000 blocks of artificial stone, 115,000 submerged, each of over 350 cubic feet and weighing 20 tons; pass of outer port enlarged from 75 yards to 110 at bottom, 2,000 yards long, 21 to 22 feet deep; dredging of dock basin, 62 acres out of 76; Basin de Commerce finished, 10 acres, depth 36 to 37 feet. Tonnage of port 15th June, 1866, to 1st June, 1867; vessels 880; tons, 146,107.

MARITIME CANAL—*General Works.*—Plant for transport and transit completed and delivered. 1867. First half year's receipts, 20,800*l.*; tons carried, 9,506; passengers, 20,132; steam power used on canal, 17,768 h.p.; coal, tons per month, 12,219; inhabitants of isthmus, 25,000, of whom 6,388 native labourers, 6,990 European labourers; dredging in one year, 353,000,000 cubic feet.

North of Lake Timsah.—Since 1866 long trough dredgers in use from Port Said to Timsah, depth 20 to 22 feet, inclination of banks 45° ; Port Said to El Guisr, 110 yards breadth. Borel and Levalley's contract—1st year, 13,000,000 cubic feet; 2nd year, 51,000,000 cubic feet. From 15th March, 1866, to 1867, total cube of two sections, Cape and Lake Ballah = 42,000,000 cubic feet. Couvreux' contract—El Ferdane to El Guisr, to 1st June, 122,500,000 cubic feet, out of 146,000,000. Lake Timsah filled to sea level and a dredger at work.

South of Lake Timsah.—Timsah to Serapeum, 110 yards width, cutting began at Serapeum plateau; 8 large dredgers in water 20 feet above sea level, and doing 900 to 1,000 cubic feet. Bitter Lakes—Excavation by hand labour of large lake to Chalouf and of small lake to Suez; in January, 1876, dredgers on the plateau Chalouf to Suez.

SUEZ.—Four large dredgers at work in roadstead.

1867-68.

PORT SAID.—Western mole, 2,350 yards completed and 100 yards to water edge; eastern mole, 1,830 yards, of which 280 embanked with stone from Plateau of Hyenas; Dussaud frères had submerged all but 57,802 blocks of stone, of which 33,031 had yet to be made; Borel and Levalley had dredged in passes and basin 123,000,000 cubic feet, out of 165,000,000 cubic feet.

MARITIME CANAL—*General Works.*—On the 15th April there still remained to be excavated a total of over 1,200,000,000 cubic feet. Monthly work :—

	Cubic feet.
8 elevator dredgers	4,300,000
30 dredgers, with barges	21,000,000
22 long trough dredgers	31,000,000
	<hr/>
	56,300,000
22 inclined planes	4,700,000
7,500 labourers	13,500,000
	<hr/>
	74,500,000

North of Lake Timsah.—Couvreur's contract—Port Said to Timsah, $5\frac{1}{2}$ miles, 156,000,000 cubic feet; at El Ferdane, $3\frac{3}{4}$ miles, 34,000,000 cubic feet; finished six months in advance of contract. Borel and Levalley—Dredgings, 306,000,000 cubic feet out of 911,000,000; monthly work, January, 1,700,000, April, 2,400,000. At work—16 long trough dredgers, 6 elevator dredgers, 9 dredgers, with barges.

South of Lake Timsah.—From Lake Timsah to Bitter Lakes, 160,000,000 out of 300,000,000 cubic feet; 11 dredgers at work, doing each 882,500 cubic feet per month; excavated by hand, 24,500,000 cubic feet, out of 45,600,000; excavations by hand going on over 21 miles, from Bitter Lakes to Chalouf. There remained to be finished 248,000,000 cubic feet.

SUEZ.—Borel and Levalley; dikes and embankments in roadstead, by 15th April, 1,600,000 cubic feet of stone submerged out of 2,300,000.

1868-69.

Moles finished at the beginning of 1869. Pass in 1868, 21 to 23 feet deep; now, 29 to 30 feet deep.

MARITIME CANAL—*General Works.*—From Port Said to Bitter Lakes canal open to its full width and length; dredgers at work completing depth.

North of Lake Timsah.—Nil.

South of Lake Timsah.—Flooding of Bitter Lakes commenced in March, 1869; Bitter Lakes to Red Sea, 22 miles by hand, 3 miles by dredgers.

SUEZ.—Suez pass finished; breakwater, over 1,600 yards of stonework.

It will be noticed that in 1864 the native contingents, which in accordance with the Act of Concession were to be employed almost exclusively on the works, were finally withdrawn.

Independently of the objections against forced labour, it is indisputable that the employment of 18 to 20,000 fellaheen on the Suez Canal—added to the numbers journeying to and from the canal to relieve one another—was a serious tax on the resources of a country like Egypt, dependent entirely on agriculture for existence, and having immense labour requirements to keep up its irrigation system, natural and artificial.

The Egyptian Government profited by the occasion to claim the abrogation of certain other portions of the acts of concession. The difference was submitted to the Emperor Napoleon, whose award was as follows:—¹⁷

	frs.	£
1. Corvée labour to cease, the Egyptian Government paying the company an indemnity of	38,000,000	= 1,520,000
2. The Egyptian Government to regain possession of the freshwater canal from Cairo to Lake Timsah (the company retaining the right of use), on payment of an indemnity for work done and to be done, of	10,000,000 „	400,000
And as compensation for navigation dues	6,000,000 „	240,000
3. The Egyptian Government to regain possession of 60,000 hectares ¹⁸ (say 150,000 acres) of land brought under cultivation by the creation of the freshwater canal, on payment of an indemnity of 500 frs. (20 <i>l.</i>) per hectare	30,000,000 „	1,200,000
	<hr/>	<hr/>
	84,000,000	= 3,360,000

The area of lands necessary for the wants of the company was determined at 10,264 hectares or over 25,000 acres on the maritime canal, and 9,600 hectares or over 24,000 acres on the freshwater canal.

In 1869, on the payment of 30 million frs. = 1,200,000*l.* represented by the coupons up to 1894 on the 176,602 shares which the Egyptian Government had acquired as an ordinary subscriber, the State recovered possession of its custom dues on the company's imports, of its tolls on the freshwater canal, of the postal telegraph services, of the fishery rights on canal and lakes, of the hospitals on the isthmus with their appurtenances, of sundry

¹⁷ "Percement de l'Isthme de Suez, Actes Constitutifs," &c., &c., published by M. F. de Lesseps in the name of the Board of Directors. Sixth series. Paris, 1866.

¹⁸ The Turkish Government, with a foresight of which England now profits, urged the necessity of the retrocession of lands, to prevent the company gaining eventually too great political power or local influence.

premises along the canal, of the quarries and port of Mex with their plant, of the storehouses of Boulac and Damietta, and of the right to half the proceeds of any of the lands on the maritime canal which the company might put on sale.

Finally, by a further payment of 10 million frs. = 400,000*l.*, the State regained possession of the domain of the Wady, the valley traversed by the freshwater canal—the land of Goshen of the Bible, according to some Egyptologists.

On the 17th November, 1869, M. de Lesseps had the satisfaction to see the end of his fifteen years' struggle. A fleet headed by the yacht of the empress of the French passed through the canal from the Mediterranean to the Red Sea. The problem of so many centuries was at last solved.

The isthmus which in 1859 counted 150 inhabitants, of whom 25 were Europeans, now contains a permanent population of over 21,000 (7,000 Europeans), of whom 17,000 in Port Said and stations and the rest at Ismailia, to say nothing of Suez, formerly an Arab village, now a town of 11,000 inhabitants, thanks to the canal traffic and the company's water supply.

Two towns have therefore been created—built is hardly the word for desert sites wanting everything—and a Mediterranean harbour established. This latter with moles and quays of a total length of over 3 miles, of an outer port of over 4,000 acres, a port of 130 acres, a channel of 10 acres, and docks covering 120 acres.

As to the canal itself, the gigantic nature of the works may be gathered from the fact that the total cube of the excavating was 75 million metres, or nearly 2,649 millions of cubic feet. As points of comparison I may remark that the dredgings at—

Toulon from 1848 to 1857 amounted to 7,400,000 cubic metres or 261,000,000, cubic feet.

Glasgow, from 1844 to 1865, amounted to 6,696,700 cubic metres, or 236,500,000 cubic feet.

Newcastle, from 1862 to 1865, amounted to 7,000,000 cubic metres, or 247,000,000 cubic feet.

For the French exhibition of 1867 it required six months to excavate 400,000 cubic metres of earth, or 14,100,000 cubic feet, at the Trocadéro, whilst the Canal Company towards the end of the period of construction was working at the rate of 25 million cubic metres, or 883 millions of cubic feet per annum.

The greater part of the work was of course done by machinery, but it must not be forgotten that till then such huge machinery did not exist, and that the contractors had to invent special dredgers and other engines and apparatus to enable them to keep their engagements.

We have thus the inclined planes for the mining part of the

work; inclined railways, that is, with fan-shaped sidings top and bottom, and trucks drawn up by stationary engines for the stone and sand removed by the miners; elevators, or dredgers, provided with cases which are raised to the crest of the banks by steam power, and by the release of a spring discharge their loads and return; finally the long trough dredgers, huge engines of 500 to 600 tons (the one sunk in the canal in June, 1885, weighed 760 tons), provided with troughs 230 feet long, supported on lighters and trestles, and along which the dredgings flow, hastened by a stream of water from steam pumps, across the crest of the banks to the land beyond.¹⁹

As to the hand labour, the lovers of statistical pleasantries may be interested to know that the couffins, or rude Arab baskets, used by the natives at the trench of El Guisr alone, would reach, placed end to end, three times round the world.

When we consider that sixty years since the short Mahmoudieh canal is said to have cost the lives of 30,000 fellaheen, it is gratifying to note the following statistics of the company's chief medical officer:—

		Per cent.		
1863.	Mortality	1'40		
'64.	"	1'36		
'66.	"	2'49	Population	18,605
'67.	"	1'85	"	25,770

In 1868, notwithstanding the enormous amount of work done by hand and by machinery, the mortality on a population of 34,258 was but 1'52 per cent., against a mortality in the whole of France of 2'40 per cent., and in the French army of 1'94 per cent.

We may surely then congratulate M. de Lesseps on his peaceful conquest in the words of our national poet:—

"A victory is twice itself when the achiever brings home full numbers."

Much Ado About Nothing, act i, scene i.

IV.—*The Accounts of the Canal.*

The Suez Canal is doubtless a great engineering triumph, but after all the true test of its success is its commercial value.

We have to ask the very commonplace questions: What did it cost? What does it pay?

To these questions we are now about to seek an adequate answer.

With the hope of saving labour and researches to future inquirers, and also of placing before the Society all the information obtainable, I have epitomised the yearly accounts of the company, from the opening of the canal to the end of 1886.

¹⁹ "Histoire de l'Isthme de Suez," par Olivier Ritt. Paris, 1869.

Yearly Balance Sheets. Assets.

	1 Assets representing Cost of Maritime Canal.*	2 Assets as in Col. 1, with addition for Expenses of Construc- tion, &c.†	3 Assets as in Col. 2, with certain Minor Deductions.	4 Assets according to Valuation.‡	5 Available Assets (Cash in Hand, &c.).	6 Reserved Assets (Balance of Trentenary Bonds).	7 Total.
	£	£	£	£	£	£	£
1870	16,631,953	17,405,036	17,405,036	691,072	115,336	—	18,211,444
'71	17,405,036	17,643,726	17,446,287	826,680	325,700	600,561	19,199,228
'72	17,446,287	17,502,119	17,480,809	793,710	338,918	320,000	18,933,437
'73	17,480,809	17,512,425	17,477,063	858,939	393,730	320,000	19,049,732
'74	17,477,063	18,878,725	18,870,799	871,821	1,079,228	320,000	21,141,848
'75	18,870,799	18,886,398	18,886,243	847,864	778,395	320,000	20,832,502
'76	18,886,243	18,911,982	18,911,982	872,557	757,783	320,000	20,862,322
'77	18,911,982	18,950,760	18,916,872	884,924	847,153	320,000	20,968,949
'78	18,916,872	19,133,561	19,132,230	713,607	793,900	320,000	20,959,737
'79	19,132,230	19,167,040	19,167,027	703,850	776,931	—	20,647,808
'80	19,167,027	19,239,047	19,239,047	672,730	1,903,545	—	21,815,322
'81	19,239,047	19,275,903	19,275,903	674,558	1,656,418	—	21,606,879
'82	19,275,903	19,335,279	19,335,279	672,836	1,997,934	—	22,006,049
'83	19,335,279	19,522,200	19,522,200	656,950	2,249,459	—	22,428,609
'84	19,522,200	19,631,434	19,631,434	654,659	2,208,109	—	22,494,202
'85	19,631,434	19,782,838	19,782,838	656,841	2,183,508	—	22,623,187
'86	19,782,838	20,235,985	20,235,985	693,560	1,989,020	—	22,917,565

* The items composing this amount in 1870 were:—construction proper, 11,653,218*l.*; transit, telegraph, estate, and sanitary services, 533,552*l.*; management charges, 1859-69, eleven years, 567,296*l.*; interest on shares, 1859-69, eleven years, paid from capital, 2,673,864*l.*; interest and repayment of debentures, 1868-69, two years, 585,118*l.*; banking charges, stamps and fiscal dues, issues of shares and loan, loss in Egyptian Treasury bonds (since recouped), 618,905*l.* They are not repeated in any subsequent year.

† The chief difference between Cols. 1 and 2 is made by the item of "improvements and repairs, sundry expenses of the year, new plant."

‡ The items comprising this amount in 1870 were:—company's premises in Paris, furniture and fixtures, Paris and Egypt, 41,102*l.*; estate, lands, buildings, furniture, &c., 192,501*l.*; maintenance account, raw materials, coals, stores, &c., 220,490*l.*; transit, navigation and telegraphs, plant, furniture, apparatus, stores, &c., 18,504*l.*; water supply, works, conduits, reservoirs, machinery, furniture, buildings, sheds, &c., 218,475*l.*

Yearly Balance Sheets. Liabilities.

(1). CAPITAL ACCOUNT. 400,000 Shares at 500 frs. = 20l., Repayable by Drawings, Ninety-Nine Years, 1968.

	Amount.		Amount.	
			In Circulation.	Repaid by Drawings.
	£		£	£
1870	8,000,000	1877	7,969,260	30,740
'71	8,000,000	'78	7,964,500	35,500
'72	8,000,000	'79	7,959,500	40,500
'73	8,000,000	'80	7,954,260	45,740
'74	8,000,000	'81	7,948,760	51,240
'75	8,000,000	'82	7,942,980	57,020
'76	8,000,000	'83	7,936,900	63,100
		'84	7,930,520	69,480
		'85	7,923,820	76,180
		'86	7,916,800	83,200

(2). LOANS (a), Consolidation of Overdue Interest on Share Capital, 400,000 Bonds, 3l. 8s. = 85 frs., bearing Five per Cent. Interest, Payable Half-Yearly and Repayable by Drawings within Forty Years, 1882-1922.

	Amount.		Amount.	
			In Circulation.	Repaid.
	£		£	£
1874	1,360,000	1882	1,359,201	799
'75	1,360,000	'83	1,358,361	1,639
'76	1,360,000	'84	1,357,481	2,519
'77	1,360,000	'85	1,356,552	3,448
'78	1,360,000	'86	1,355,580	4,420
'79	1,360,000			
'80	1,360,000			
'81	1,360,000			

(3). LOAN (b) of 1867-68. 333,333 Bonds at 12l. = 300 frs., bearing Interest 25 frs. or 1l. per Annum, Payable Half-Yearly and Repayable at 500 frs. = 20l. by Drawings within Fifty Years, 1868-1918, with Premiums of 250,000 frs. or 10,000l. per Annum.

	Amount.		Amount.	
			In Circulation.	Repaid.
	£		£	£
1870	3,999,996	1877	3,778,560	221,436
'71	3,999,996	'78	3,748,632	251,364
'72	3,999,996	'79	3,717,180	282,816
'73	3,999,996	'80	3,684,132	315,864
'74	3,999,996	'81	3,649,416	350,580
'75	3,999,999	'82	3,612,936	387,060
'76	3,999,996	'83	3,574,620	425,376
		'84	3,534,360	465,636
		'85	3,492,060	507,936
		'86	3,447,624	552,372

Yearly Balance Sheets. Liabilities—Contd.

- (4). LOAN (c) of 1871. 200,000 Bonds at 4l. = 100 frs., bearing Interest of 8 frs. per Cent. = 8 per Cent. per Annum, Payable Half-Yearly and Repayable at 125 frs. = 5l. by Drawings within Thirty Years, 1873-1902, of which 120,000 Issued.

1871 ...	Amount.			1885..... '86.....	Amount.		
	£				120,000 Issued.	In Circulation.	Repaid.
	120,000 Issued.	In Circulation.	Repaid.		£	£	£
	800,000						
	£	£	£				
1872 ...	480,000	—	—		80,000 Reserved.		
'73 ...	480,000	—	—		£s		
'74 ...	480,000	—	—	1872.....	320,000		
'75 ...	480,000	—	—	'73.....	320,000		
'76 ...	480,000	—	—	'74.....	320,000		
'77 ...	—	442,296	37,704	'75.....	320,000		
'78 ...	—	434,856	45,144	'76.....	320,000		
'79 ...	—	428,252	51,748		In Circulation.	Cancelled.	
'80 ...	—	418,848	61,152		£	£	
'81 ...	—	408,844	71,156	1877.....	300,024	19,976	
'82 ...	—	398,200	81,800	'78.....	293,624	26,376	
'83 ...	—	386,876	93,124				
'84 ...	—	374,824	105,176				

- (5). LOAN (d) of 1880, at Sundry Prices, bearing 15 frs. Interest Payable Half-Yearly, Repayable in Fifty Years (1930) in 20l. = 500 frs.

1880..... '81..... '82..... '83..... '84..... '85..... '86.....	Amount.			
	15,152. 330 frs.	11,848. 350 frs.	3,438. 369'35 frs.	56,101 at Various Prices.
	£	£	£	£
1880.....	40,001	—	—	—
'81.....	80,002	—	—	—
'82.....	162,487	—	—	—
'83.....	185,793	121,646	—	—
'84.....	200,006	165,872	50,793	—
'85.....	200,006	368,081	—	—
'86.....	200,006	—	—	852,345

- (6). OTHER LIABILITIES. Sundry Creditors, Unpaid Interest, Dividends and Drawn Bonds and Shares, Bills Payable, &c.

£		£	
1870	338,214	1879	400,561
'71	488,310	'80	1,278,428
'72	139,541	'81	592,335
'73	143,487	'82	760,209
'74	320,517	'83	857,137
'75	345,337	'84	881,856
'76	367,589	'85	905,442
'77	384,078	'86	887,782
'78	365,745		

Yearly Balance Sheets. Liabilities—Contd.

(7). SPECIAL ACCOUNTS.

	Legal Reserves.	Special Fund, 1874.	Cancelled Bonds on Unplaced Part of Trentenary Issue.	Renewal of Plant Fund.	Balances of Consolidated Coupons not Presented.	Special Sinking Fund of Delegations.
	£	£	£	£	£	£
1873	—	—	2,948	10,000	—	—
'74	—	—	6,148	20,000	423,858	194,446
'75	2,235	85,935	8,548	24,593	36,227	194,446
'76	6,452	85,935	13,576	12,410	9,084	194,446
'77	15,925	52,047	19,976	22,952	4,865	194,446
'78	23,562	14,815	26,376	20,688	3,244	194,446
'79	29,340	—	16,091	24,412	2,286	194,446
'80	55,299	—	15,192	50,084	1,768	178,582
'81	107,252	—	15,192	59,772	1,533	173,584
'82	173,935	—	12,554	36,583	1,346	168,252
'83	249,437	—	12,554	36,181	1,238	162,710
'84	249,437	—	12,554	5,325	1,166	156,947
'85	249,437	—	7,280	7,185	1,095	150,865
'86	249,437	—	7,280	68,246	1,057	144,439

(8). PROFIT AND LOSS. *Profits of the Year. From 1880 the Unpaid Balance of Dividend alone is Credited exclusive of the Amounts paid on Account.*

	£		£
1872	82,851	1880	324,191
'73	182,252	'81	705,432
'74	104,595	'82	816,269
'75	42,468	'83	927,499
'76	80,117	'84	895,832
'77	180,003	'85	854,108
'78	145,084	'86	627,284
'79	109,795		

(9). BALANCE. *Representing Surplus Assets, exclusive of Value of Company's Joint and Separate Estates Entered as Memo. only.*

	£		£
1870	5,873,234	1879	6,030,881
'71	5,910,922	'80	6,031,781
'72	5,911,049	'81	6,031,781
'73	5,911,049	'82	6,034,418
'74	5,912,288	'83	6,034,418
'75	5,932,717	'84	6,034,418
'76	5,932,717	'85	6,039,693
'77	5,934,661	'86	6,039,693
'78	6,005,781		

Yearly Balance Sheets. Liabilities—Contd.(10). TOTAL LIABILITIES (*additions of 1, 2, 3, 4, 5, 6, 7, 8, and 9 on previous pages.*)

	£		£
1870.....	18,211,444	1879.....	20,647,808
'71.....	19,199,228	'80.....	21,815,322
'72.....	18,933,437	'81.....	21,606,879
'73.....	19,049,732	'82.....	22,006,049
'74.....	21,141,848	'83.....	22,428,609
'75.....	20,832,502	'84.....	22,494,202
'76.....	20,862,322	'85.....	22,623,188
'77.....	20,968,949	'86.....	22,917,565
'78.....	20,959,737		

It is beyond the scope of this paper to form a mathematical estimate of the theoretic cost of the canal; in other words, to compute the probable value of the contributions in money, land, and labour, of the Egyptian State. We are concerned with the cost of the canal from a business point of view, and may therefore content ourselves with the company's figures.

The assets of the company as given in the last balance sheet were:—

<i>Cost of construction of the canal, and maintenance and improve-</i>	£
<i>ments to date</i>	20,234,985
This amount includes—	£
Interest paid on shares during construction	2,673,864
„ and sinking fund of loans, 1868-69, two } years	585,118
Management charges during eleven years	567,296
Loss on balance sheets of 1870 and 1871	489,260
Repairs, improvements, and new plant, sixteen } years	1,406,557
	<hr/>
	5,722,095
<i>Assets according to valuation—</i>	
<i>Offices of the company, Paris, London, and Cairo</i>	48,386
<i>Estate account—</i>	
Buildings, &c.	158,094
Land not estimated, memo. only	—
<i>Navigation and telegraphs.—Offices, plant, and stores</i>	17,670
<i>Maintenance account.—Plant and stores for mainte-</i> <i>nance of canal</i>	376,078
<i>Waterworks.—Ismailia, Port Said, and Suez</i>	93,332
	<hr/>
	693,560
<i>Available assets—</i>	
Cash, bills, unpaid calls, sundry debtors, &c.	1,989,020
	<hr/>
	22,917,565
	<hr/>

Against this sum the company had the following liabilities:—

Liabilities.

	£
Capital, 400,000 shares at 20 <i>l</i>	8,000,000
Of which 3,809 shares, 76,180 <i>l</i> . paid off by the operation of sinking fund of 0·40 per cent.	

Loans.

Loan.	Bonds in Circulation.	Number of Bonds Repaid.	Interest per Bond.	Nominal Value.	Date of Final Extinction.	Bonds Originally Issued.	Issue Price.	
Consolidated coupons } 1867-68 '71..... '80..... '80.....	398,986 291,005 90,500 15,152 25,186	1,014 42,328 29,500 — 139	frs. 4·25 8 15	frs. 85 500 125 500	1922 1918 1903 1930 {	400,000 333,333 120,000 15,152 Various	frs. 85 300 100 330 prices	1,360,000 3,999,996 480,000 200,006 852,345

Note.—Method of redemption, yearly drawings, with 250,000 frs. annual prizes on the loan of 1867-68.

Sundry creditors, unpaid dividends, bills payable, &c., &c. 887,782

Reserves—

Statutory reserve fund 5 per cent. first charge on divisible profits } until amount reaches 5,000,000 <i>l</i> ., when the annual increment } must not exceed 3 per cent.	249,437
Cancelled bonds of withdrawn portion of Trentenary issue.....	7,280
Reserved fund for removal of plant	68,246
Unclaimed balance of consolidated coupon bonds.....	1,057
Sinking fund of delegations	144,439
Profit and loss, less interim dividends.....	627,284

16,877,872

Summary.

	£
Assets	22,917,565
Liabilities	16,877,872
Surplus	<u>6,039,693</u>

It will be noticed that the loans are entered, not at the nominal or redeemable value of the bonds, but at the issuing price, that is at the amounts they brought in to the company. As events have turned out this was by no means an unsafe plan, as the value of loanable capital having decreased, and the credit of the company risen since these debts were incurred, it is certain that they might be consolidated by means of a new issue on more favourable terms.

There is also another loan, consisting of the so-called delegations, of which 120,000 were issued of a nominal value of 500 frs., bearing the interest and dividends of ordinary shares, and repayable by yearly drawings terminable in 1894.

These bonds were issued against the coupon sheets detached from the 176,602 ordinary shares of the Egyptian Government, and resold, minus the coupons to 1894, to England.

Of the 176,602 coupon sheets, 120,000 are set apart to meet the interest and dividends on the delegations, and the remaining coupon sheets provide the sinking fund to extinguish the delegation loan.

The sinking fund is represented by a yearly charge in the balance sheet, and appeared in that of the 31st December, 1886, as 144,439*l*.

There were then in circulation 58,146 bonds.

The balance sheet, as we have seen, shows a surplus of 6,039,693*l*.

This sum is thus accounted for—

<i>Indemnities from the Egyptian State—</i>		£
Imperial award, 6th July, 1864		3,360,000
Settlement of accounts and compensation } for return to Egypt of various lands and } privileges	£ 1,200,000	
Less value of Damietta store houses } already paid	10,219	
	—	1,189,781
Retrocession of Wady to the State	400,000	
Less buildings, furniture, plant, &c., of } company, and indemnity on discharg- } ing staff	94,061	
	—	305,939
		<u>4,855,720</u>
<i>Temporary investments</i>		804,141
<i>Receipts during construction of the canal—</i>		
Transit, post, telegraph, estates, sanitary service, bank- } ing profits, &c.		274,801
<i>Reserve funds applied to improvements—</i>		
Part of special fund, 1874.		
Part of capital of 6,594 cancelled bonds of Trentenary } issue		105,031
		<u>6,039,693</u>

These accounts, which I have done my best to compress as far as possible, give us I think a clear idea of the actual position of the company, of its solvency, of the value of its assets, and of the cost of the canal.

The following tables of the receipts and expenditure of the company since the opening of the canal will give us some details of the earning power of the enterprise:—

Receipts.

	Banking Profits. ^a	Estates. ^b	Transit and Navigation. ^c	Main- tenance Account. ^d	Water Supply. ^e	Special Accounts, 1870. ^f	Receipts concerning Previous Years ^g	Total Receipts.	Expenditure, Interest, &c. ^h	Net Profits.	Five per Cent. to Reserve Fund, in accordance with Article 69.	Balance Distributed.
	£	£	£	£	£	£	£	£	£	£	£	£
1870.....	8,665	11,448	228,750	14,439	721	106,949	383,560	754,532	1,189,082	44,703	2,235	42,468
'71.....	3,420	42,782	370,018	108,392	6,193	237	105,700	636,742	1,162,654	84,383	4,216	80,117
'72.....	18,508	42,268	663,710	5,417	3,097	—	—	733,000	1,169,549	189,477	9,474	180,003
'73.....	18,027	39,053	928,000	4,698	3,211	—	256	993,245*	1,147,133	152,720	7,636	145,084
'74.....	19,107	30,119	1,004,371	8,112	3,631	—	13,706	1,069,046†	1,122,392	115,574	5,779	109,795
'75.....	25,072	34,011	1,164,950	5,155	3,900	—	697	1,233,785	1,153,672	519,164	25,958	493,206
'76.....	11,452	21,600	1,206,190	2,427	4,081	—	1,237	1,246,987	1,147,970	1,039,076	51,954	987,122
'77.....	9,857	21,451	1,318,100	4,176	4,748	—	694	1,359,026	1,202,729	1,333,655	66,683	1,266,972
'78.....	17,632	20,618	1,251,692	1,332	4,870	—	3,709	1,299,853	1,230,890	1,510,043	75,502	1,434,541
'79.....	14,049	17,574	1,195,054	4,812	5,204	—	1,273	1,237,966	1,213,457	1,402,874	Nil	1,402,874
'80.....	22,439	22,126	1,599,700	6,395	5,764	—	16,412	1,672,836	1,240,847	1,361,151	"	1,361,151
'81.....	76,389	21,821	2,069,508	12,266	6,895	—	167	2,187,046	—	—	—	—
'82.....	52,582	21,462	2,443,022	12,058	7,147	—	113	2,536,384	—	—	—	—
'83.....	36,480	43,742	2,645,504	6,546	8,210	—	451	2,740,933	—	—	—	—
'84.....	37,663	57,264	2,505,558	6,170	8,251	—	1,425	2,616,331	—	—	—	—
'85.....	39,325	47,250	2,498,980	5,164	10,974	—	305	2,601,998	—	—	—	—
'86.....												

^a Interest on temporary investments; exchange profits, &c.

^b Revenue of joint estate and company's estate; sale of lands; allowance of Government for deficiency.

^c Tolls of vessels, passengers, and boats; pilotage, towage, wharfage; traffic by company's boats; hire of plant.

^d Sundry receipts.

^e Deficit 1870-71 transferred to account of first cost of construction.

^f Inclusive of interest and sinking fund of consolidated coupon bonds; interest and sinking fund on share capital.

* Total Receipts, 1873 £ 993,245
Expenditure of the year 1873 693,844

Brought forward from 1872 299,401

Brought forward from 1872 82,851

July coupon 1870 on capital paid in 1873 382,252

..... 200,000

..... 182,252

† Total receipts, 1874..... £1,069,046
Expenditure of the year 1874 746,703

Brought forward from 1873 322,343

..... 182,252

..... 504,595

Interest for second half year of 1870 paid in 1874 400,000

..... 104,595

Annual sinking fund of shares 1870-74, as per Articles of Association 18,660

..... 85,935

Expenditure.

	Charges on Capital. ^a	Adminis- trative Charges. ^b	Estate. ^c	Transit, Navigation, and Telegraph. ^d	Main- tenance of Plant and Ware- houses. ^e	Water Supply. ^f	Charges of Year.	Charges of Previous Years.	Total.
	£	£	£	£	£	£	£	£	£
1870....	421,662	42,790	16,712	60,231	110,380	8,887	660,662	93,870	754,532
'71....	422,484	38,464	22,472	68,792	71,718	11,538	635,468	1,274	636,742
'72....	456,716	35,825	23,643	64,570	62,851	6,545	650,150	82,850	733,000
'73....	469,164	36,753	24,557	61,378	92,567	8,822	693,241	603	693,844
'74....	495,008	37,733	18,406	60,233	121,719	9,680	742,779	3,924	746,703
'75....	463,292	38,718	23,208	63,342	113,323	10,053	711,936	5,925	717,86
'76....	465,785	42,344	19,433	62,363	91,868	7,993	689,786	1,105	690,891
'77....	466,219	45,400	19,081	64,796	91,335	10,452	697,283	1,036	698,319
'78....	464,883	46,729	17,143	63,852	74,624	8,506	675,737	173	675,910
'79....	456,329	42,944	11,669	61,667	71,077	7,338	651,024	143	651,167
'80....	463,559	45,705	16,393	62,329	83,195	10,086	681,267	1,190	682,457
'81....	464,069	45,626	14,158	66,592	78,832	7,151	676,428	331	676,759
'82....	465,287	51,296	22,710	97,350	85,694	7,721	730,058	652	730,710
'83....	469,046	59,761	38,528	93,438	89,746	7,781	758,300	561	758,861
'84....	476,658	57,429	32,461	91,273	75,970	7,197	740,988	446	741,434
'85....	483,564	56,226	40,575	97,310	82,538	8,352	768,565	253	768,818
'86....	489,489	57,825	22,098	90,975	84,006	9,765	754,158	409	754,567

^a Interest and sinking fund of debentures and trentenary bonds; stamp and transfer dues; issue charges on loans; Egyptian Government control, and divers other expenses.

^b *France*.—General administration; board of direction; staff; general meeting; publications; London agency. *Egypt*.—Staff; head agency; sanitary service.

^c Staff and sundry expenses; superintendence and appropriation of lands; roads; new plantations; care of buildings and plantations; agricultural experiments; portion concerning Egyptian Government, as per accounts of company in the receipts of 1873.

^d Staff; sundries; working expenses; traction; coal; tools; repairs to plant, buoys, &c.

^e Staff; maintenance and repairs of plant and depôts of canal accessories; renewal of plant, &c.

^f Staff, coal, &c.; repairs; renewal fund.

The *Expenditure* items call for little remark; they are as follows:—

2 M 2

	£
<i>Interest and sinking fund of loans, an increase on 1870 of 68,000l.</i>	489,489
<i>Administrative charges, increase on 1870 of 15,000l., average 46,000l.</i>	57,825
<i>Estate charges, 150 per cent. more than in 1870, average 22,500l.</i>	22,098
<i>Transit, navigation, and telegraph charges, very steady, 60,000l. to 66,000l. from 1870 to 1881, when they increased 50 per cent.</i>	90,975
<i>Maintenance of plant and warehouses, against which there is usually a small set off in receipts</i>	84,006
<i>Water supply, from 1870 to 1880, varying from 6,500l. to 11,500l., since when steady, 7,000l. to 9,700l.</i>	9,765
<i>Charges of previous accounts</i>	409
	<hr/> 754,567 <hr/>

The receipts, on the other hand, were as follows:—

	£
Banking profits.....	40,129
Maintenance account	10,662
Receipts of previous years	75
Estate accounts.....	27,510
Water supply	10,598
Transit and navigation.....	2,271,931
	<hr/> 2,360,905 <hr/>
Less expenditure—	
Interest, 5 per cent, and sinking fund of share capital; interest, 5 per cent., and sinking fund of consolidated coupons	1,226,578
	<hr/>
Net profits.....	<hr/> 1,134,327 <hr/>

Of the items of receipts, the three last only are of interest to us. The receipts from landed property from 1870 are thus detailed—

Years.	Sale of Lands.	Rent of Lands.	Sale of Buildings.	Rent of Buildings.
	£	£	£	£
1870	—	2,861	—	7,801
'71	33,608	3,124	6,219	6,405
'72	33,362	2,733	4,426	4,830
'73	30,860	3,495	764	4,474
'74	10,385	2,512	1,937	4,469
'75	17,043	2,365	8,057	7,372
'76	5,665	1,287	8,622	10,036
'77	2,134	3,331	5	10,389
'78	2,737	2,046	157	10,076
'79	1,625	1,905	11	10,663
'80	10,790	1,952	587	9,875
'81	8,321	1,054	241	11,094
'82	5,400	3,472	1,050	11,071
'83	28,584	3,560	5,388	11,145
'84	43,513	3,694	4,560	11,524
'85	31,931	4,098	2,299	11,221
'86	11,500	4,761	1,723	11,249

The amounts of the sales are of course very irregular, but the rents, it will be noticed, are steady and increasing. As before remarked, the company takes no credit in its balance sheets for the value of unsold lands.

From 1872 to 1886 the receipts for water supplied have increased from 3,000*l.* to 8,474*l.* for the Ismailia waterworks, supplying Ismailia and Port Said, and from 2,800*l.* to 4,960 (1877 to 1886) for Suez town. Whilst on the one hand the receipts will continue increasing, a fall may be expected in the expenditure, the company having, by means of an agreement, dated December, 1884, with the Government, arranged to replace the conduits and pumping stations by a branch of the freshwater canal as originally intended.

Lastly, and most important of all, I subjoin a table giving the movement of the traffic and navigation dues—the backbone of the enterprise—from which it will be seen that the last five years show an enormous increase in the transit. Taking the gross tonnage for 1870 at the arbitrary figure 100, the following is the ratio of increase:—

1870	1871	1872	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
100	174	330	478	556	674	704	785	755	743	997	1,330	1,635	1,848	1,910	2 061	1,877

The receipts of 1870 are to those of 1886 as 100 to 1,260, the tariff from 1874 to 1885 showing a fall of over 28 per cent.

The number of ships has not increased in the same ratio as the tonnage, the size of the vessels increasing year by year almost without a break.

		Ratios of Increase.	
In 1872 vessels averaged 1,330 gross tonnage, 1,073 net tonnage.....	}	Gross tonnage	1 : 1'985
In 1886 vessels averaged 2,640 gross tonnage, 1,860 net tonnage.....		Net „	1 : 1'733

Navigation Dues encashed from 1870 to 1886.

Years.	Gross Tonnage.	Net Tonnage.	Number of Ships.	Average Net Tonnage per Ship.	Total Navigation Dues.	Navigation Dues per Tonnage Net.
					frs.	frs.
1870....	—	436,609	485	898	4,345,758'42	9'95
'71....	—	761,467	765	995	7,595,385'13	9'97
'72....	1,439,169	1,160,743	1,082	1,073	14,377,092'17	12'38
'73....	2,085,070	1,367,767	1,173	1,166	20,850,726'15	15'17
'74....	2,423,672	1,631,650	1,264	1,290	22,667,791'94	13'28
'75....	2,940,708	2,009,984	1,494	1,358	26,430,790'61	13'15
'76....	3,072,107	2,096,771	1,457	1,439	27,631,458'20	13'17
'77....	3,418,949	2,355,447	1,663	1,416	30,180,928'72	12'81
'78....	3,291,535	2,269,678	1,593	1,424	28,345,672'87	12'92
'79....	3,236,942	2,263,332	1,477	1,532	27,131,116'77	11'98
'80....	4,344,519	3,057,421	2,026	1,509	36,492,620'25	11'93
'81....	5,794,401	4,136,779	2,727	1,517	47,193,882'67	11'41
'82....	7,122,125	5,074,808	3,198	1,586	55,421,039'59	10'92
'83....	8,051,307	5,775,861	3,307	1,746	60,558,488'57	10'48
'84....	8,319,967	5,871,500	3,284	1,787	58,628,759'82	9'98
'85....	8,985,412	6,335,752	3,624	1,748	60,057,259'97	9'04
'86....	8,183,313	5,767,656	3,100	1,860	54,771,076'00	9'49

Our next two tables give the profits distributed up to 1886 as well as the prices of shares, highest, lowest, and middle, and the total dividends paid.

The profits, exclusive of 5 per cent. to capital and percentage to sinking fund, were in all 8,887,096*l.*, of which—

£	Per Cent.
249,437 to Reserves	—
6,132,740 „ Shareholders	71
1,295,650 „ Egyptian Government	15
863,767 „ Founders	10
172,751 „ Directors	2
172,751 „ Staff	2
<u>8,887,096</u>	<u>100</u>

The original shareholder has had an average of $7\frac{1}{2}$ per cent. on his outlay. His stake is now worth four times what he paid, and he has moreover a consolidated coupon bond of 85 frs. The first fifteen years however were times of weary waiting. From 1871 to 1874 no dividend was paid, and at one time the price of the 500 frs. bond fell to 165 frs.

The actual rate of capitalisation is about 4 per cent. To any one interested in the welfare of Egypt it is sad to think that the embarrassments of the Government have compelled it not only to sell its coupons and its shares, but also the royalty to which its sacrifices gave it a more than equitable right. A French banking establishment took over the Government's 15 per cent. share of profits as a set off to claims against the Egyptian State, and issued bonds called "parts civiles" to the public in order to realise immediately the amount of its acquisition.

Distribution of Profits of the Suez Canal Company for the Twelve Years ending 1886.

Year.	Net Profits.	Five per Cent. to Reserve.	Available for Distribution.	7½ per Cent. to Shareholders.	15 per Cent. to Egyptian Government.	Ten per Cent. to Founders.	Two per Cent. to Direction.	Two per Cent. to Staff.
	£	£	£	£	£	£	£	£
1875	44,703	2,235	42,468	30,153	6,370	4,247	849	849
'76	84,333	4,216	80,117	56,883	12,018	8,012	1,602	1,602
'77	189,477	9,474	180,003	127,803	27,000	18,000	3,600	3,600
'78	152,720	7,636	145,084	103,010	21,763	14,509	2,901	2,901
'79	115,574	5,779	109,795	77,954	16,469	10,980	2,196	2,196
'80	519,164	25,958	493,206	350,176	73,982	49,320	9,864	9,864
'81	1,039,076	51,954	987,122	700,857	148,069	98,712	19,742	19,742
'82	1,333,655	66,683	1,266,972	899,550	190,046	126,698	25,339	25,339
'83	1,510,043	75,502	1,434,541	1,018,524	215,181	143,454	28,691	28,691
'84	1,402,874	Nil	1,402,874	996,041	210,431	140,288	28,057	28,057
'85	1,361,150	"	1,361,150	966,417	204,172	136,115	27,223	27,223
'86	1,134,327	"	1,134,327	805,372	170,149	113,432	22,687	22,687
	8,887,096	249,437	8,637,659	6,132,740	1,295,650	863,767	172,751	172,751

Prices and Dividends of Shares of Suez Canal.

Year.	Price of Shares in Paris.			Dividend.			Per Cent.
	Highest.	Lowest.	Middle Price.	On Share.	On Coupons. Bonds.	Total.	
	frs.	frs.	frs.	frs.	frs.	frs.	frs.
1861	450'00	438'75	444'37½	25'000	—	25'000	5'00
'62	510'00	423'75	466'87½	25'000	—	25'000	5'00
'63	558'75	460'00	509'37½	25'000	—	25'000	5'00
'64	498'75	412'50	455'62½	25'000	—	25'000	5'00
'65	465'00	411'25	438'12½	25'000	—	25'000	5'00
'66	447'50	220'00	333'75	25'000	—	25'000	5'00
'67	382'50	220'00	301'25	25'000	—	25'000	5'00
'68	470'00	257'50	363'75	25'000	—	25'000	5'00
'69	630'00	290'00	460'00	25'000	—	25'000	5'00
1870	385'00	200'00	292'50	25'000	—	25'000	5'00
'71	252'50	165'00	208'75	12'500	—	12'500	2'50
'72	490'00	185'00	337'50	—	—	—	—
'73	486'25	378'75	432'50	—	—	—	—
'74	475'00	375'00	425'00	—	—	—	—
'75	865'00	470'00	667'50	25'630	—	25'630	5'12
'76	840'00	770'00	805'00	27'220	—	27'220	5'44
'77	762'50	565'00	663'75	31'54½	4'25	35'79½	7'16
'78	790'00	700'00	745'00	30'44½	4'25	34'69½	6'94
'79	770'00	690'00	730'00	28'299	4'25	33'179	6'63
1880	1,327'50	715'00	1,021'25	46'886	4'25	51'136	10'23
'81	3,475'00	950'00	2,212'50	68'803	4'25	73'053	14'61
'82	3,550'00	1,875'00	2,712'50	81'22½	4'25	85'47½	17'09
'83	2,685'00	1,820'00	2,252'50	88'657	4'25	92'907	18'58
'84	2,167'50	1,810'00	1,988'75	87'252	4'25	91'502	18'30
'85	2,220'00	1,805'00	2,012'50	85'401	4'25	89'651	17'93
'86	2,220'00	1,970'00	2,095'00	75,335	4'25	79'585	15'92

Having alluded to the purchase from the Egyptian State by the Beaconsfield ministry of the 176,602 ordinary shares with coupons detached to 1894, I think this the moment to say a few words on the transaction.

The price paid for these bonds was somewhat under 4 million £; their value, taking the quotation list of 31st December, 1886, was as follows:—

	£
176,602 ordinary shares	$\frac{2090}{25} = 14,763,927$
Less value of 120,000 delegations, representing } coupons till 1894, cut off said shares	$\frac{1035}{25} = 4,968,000$
	<hr/> 9,795,927 <hr/>

Few will now contest the advantages England has reaped by this transaction, for putting on one side the financial value, present and prospective, of this acquisition, and the fact that the purchase money bears 5 per cent. (now $4\frac{1}{2}$) interest till 1894, when the shares recover their dividend rights, the possession of these shares has afforded our Government an enormous leverage for obtaining very substantial advantages for our shipping and general interests. No sooner was the purchase completed, than the company gave three of the twenty-five seats on the board to English official directors, and by the agreement of 1884 this number was increased to ten, the board however being enlarged to thirty-two members. The other concessions made at the same time were the following:—

Enlargement of the canal at company's expense.²⁰

Establishment of a London office and London committee.

Accidents and strandings taken at company's charge, when not imputable to ships' crews, and pilotage dues abolished.

Decrease of canal tolls, and further successive decreases, so that shipowners will virtually take half profits after 18 per cent. (interest included) is distributed to shareholders. After 25 per cent. dividend all profits to go in reduction of tolls till the rate of 5 frs. per ton be reached.

Confirmation of reduction of tolls on ships in ballast (2.50 frs.).

Amount carried to reserve fund not to exceed 3 per cent., when reserves attain 5 million £.

The above calculations on the basis of the present share capital.

²⁰ By an agreement, dated the 20th of December, 1886, the Egyptian Government whilst maintaining its contention that the Canal Company must have its sanction for any enlargement of the waterway, authorises the widening proposed by the Technical Commission of 1884-85, and grants to the Canal Company 4,000 hectares, say 10,000 acres, of land necessary for these improvements, at a price of 80,000*l.*

It is to be hoped that this agreement may cement a lasting peace between the company and its English customers. The state of irritation which arose during the last few years is scarcely to be wondered at—altogether apart from the momentary soreness caused by national and political susceptibilities—for whilst on the one hand we have officials belonging to a nation whose love for mathematical accuracy has raised red tapism to the level of an exact science; on the other we find merchants and captains accustomed to deal so rapidly with gigantic transactions, that the rule of thumb has been carried to an extent which makes the despair of statisticians.

A little forbearance on both sides, and the conviction that neither party can do without the other, will doubtless however prevent the return of unfriendly feelings which ought never to have existed.

Before I dismiss the question of national feelings with regard to the canal, I cannot forbear alluding to another point which it would argue a want of frankness to evade. Our neighbours never cease girding at us, and naturally so, for the discouragement the scheme received at English hands. In our pessimist views of the technical difficulties, financial prospects, and dangers to English commerce, we may have been absolutely and hopelessly wrong, but we can scarcely admit as much with respect to the political question looked at in the light of recent events.

It is clear that the creation of the canal has increased England's interests and responsibilities in Egypt to an extent far beyond what our statesmen ever desired, and this explains if it does not justify the mistrust of Lord Palmerston, and his disinclination to join in an Austrian, English and French commission to inquire into the practicability of the project. "I should say, therefore,"²¹ he wrote Lord Russell, "that it would be best for the French and English Governments to leave this scheme as a commercial and engineering question to be settled by the result of experience and the money markets of Europe"

V.—*The Utility of the Canal.*

To prove the utility to the world in general of the Suez Canal is an easy matter enough; to reduce such utility to figures, however, and to apportion it among the different peoples and the various classes of the trading community is quite a different matter.

For the elucidation of this latter point I can only submit the data I have been able to collect, adding, for what they are worth, such considerations as suggest themselves to me.

The gain in distance from London to the Eastern and Australian ports is as follows :—

²¹ Oakley's "Life of Lord Palmerston," appendix, vol. ii.

Ports.	By Cape.	By Canal.	Saving by Canal.	
			Amount.	Per Cent. of Voyage (Cape).
	Nautical miles.	Nautical miles.	Nautical miles.	
Bombay	10,667	6,274	4,393	41'2
Madras	11,280	7,313	3,967	35'2
Calcutta	11,900	8,083	3,817	32'1
Singapore (<i>via</i> Straits of } Sunda)	11,740	8,362	3,378	28'8
Hong Kong	13,180	9,799	3,381	25'6
Shanghai	14,050	10,669	3,381	24'1
Adelaide	11,780	11,100	680	5'8
Melbourne	12,140	11,585	555	4'6
Sydney	12,690	12,145	545	4'3
Wellington, New Zealand..	13,610	13,055	555	4'1

In time, however, there is still a period of twenty-four to thirty hours to be gained, as the transit from 1870 to 1873 was frequently effected in from twelve to fifteen hours, whereas of late years the average duration varied from forty to fifty hours, as will be seen by the following figures :—

Average Duration of Transit through the Suez Canal.

Year.	Actual Steaming.		Total Transit.	Year.	Actual Steaming.		Total Transit.
	H.	M.	H. M.		H.	M.	H. M.
1876	17	—	39 —	1882	18	57	53 46
'77	17	30	40 24	'83	19	32	48 36
'78	17	15	40 10	'84	18	44	41 53
'79	17	12	40 30	'85	18	22	43 —
'80	17	10	41 —	'86	17	52	36 11
'81	18	16	45 53				

To attain the maximum rapidity of transit the canal will have to be enlarged, which is about being done, and the introduction of electric lighting, together with the increase of the number of beacons and buoys, will be necessary.

The economy of time, that is of charges on goods and interest on capital, and the gain in safety and consequent saving in insurance, constitute the positive and concrete utility of the Canal.²²

The two following tables, giving the analysis of the class of vessels using the canal, and particulars of the passenger traffic, show us the utility of the new route from other than trading points of view :—

²² Steamers carrying the electric light may now pass through the canal at night. The Peninsular and Oriental Company and the Messageries Maritimes have already availed themselves of this privilege, and thus considerably shortened their transit time. Average in 1886 for ships using electric light: actual steaming 17h. 1m., total transit 20h. 42m.

Description of Vessels Passing the Canal from 1876 to 1886.

Years.	Merchant Steamers.	On Ballast.	Postal Packets.	Steam Transports.	Yachts.	Despatch Boats.	Corvettes.	Frigates.	Iron-clads.	Sailing Vessels.	Gun-boats.
1876....	1,042	—	315	37	11	12	10	4	2	5	3
'77....	1,264	—	298	39	4	12	12	—	—	6	3
'78....	1,089	—	282	75	7	14	9	4	4	25	5
'79....	1,035	—	298	55	7	14	11	—	—	1	13
'80....	1,534	—	363	54	7	20	11	1	4	—	9
'81....	2,010	155	442	42	8	18	9	—	3	1	14
'82....	2,361	154	501	134	10	(154 hired transports)					
'83....	2,498	96	588	54	7	25	9	3	5	1	10
'84....	2,455	23	614	96	3	18	17	—	5	—	24
'85....	2,514	23	580	357	11	32	15	—	15	3	26
'86....	2,258	9	614	117	7	20	27	2	4	2	28

Years.	Sea Dredgers.	Mud Barges.	Steam Tugs.	Steam Barges.	Cruisers.	Sloops.	Clippers.	Cis-tern.	Torpedo Boats.	Total.	Entered from Mediterranean.	Entered from Red Sea.
1876....	5	6	3	2	—	—	—	—	—	1,457	759	698
'77....	5	—	17	—	3	—	—	—	—	1,663	896	767
'78....	14	3	59	—	2	1	—	—	—	1,593	783	810
'79....	4	—	32	—	7	—	—	—	—	1,477	742	735
'80....	2	2	13	—	3	1	2	—	—	2,026	1,054	972
'81....	1	1	15	—	8	—	—	—	—	2,727	1,406	1,321
'82....	(154 hired transports)			37	—	—	—	1	—	3,198	1,610	1,588
'83....	2	—	1	—	8	—	—	—	—	3,307	1,663	1,644
'84....	2	2	6	—	17	—	—	2	2	3,284	1,669	1,615
'85....	1	—	8	—	26	—	—	2	11	3,624	1,862	1,762
'86....	1	—	2	—	—	—	—	5	4	3,100	1,511	1,589

Analysis of Passenger Receipts of Canal Company.

Years.	Troops.				Pilgrims.	Colonists.		Con-victs.	Coo-lies.	Ordinary Pas-sengers.	Pas-sengers by Small Boats.	Total.	Re-ceipts.
	English.	French.	Others.	Total.	Maho-metans.	Austra-lian Emi-grants.	Si-berian Colo-nists.		Chi-nese.				
1870.	—	—	—	—	—	—	—	—	—	—	—	26,758	10,703
'71.	—	—	—	—	—	—	—	—	—	—	—	48,422	19,369
'72.	—	—	—	—	—	—	—	—	—	—	—	67,640	27,056
'73.	—	—	—	—	—	—	—	—	—	—	—	68,031	27,212
'74.	—	—	—	—	—	—	—	—	—	—	—	73,597	29,438
'75.	—	—	—	—	—	—	—	—	—	—	—	84,446	33,778
'76.	20,469	5,876	14,075	40,420	8,362	—	—	—	—	20,832	2,229	71,843	28,737
'77.	—	—	—	39,463	8,949	—	—	—	—	24,409	—	72,821	29,128
'78.	—	—	—	58,274	11,919	—	—	—	—	26,170	2,847	99,210	39,684
'79.	—	—	—	42,775	12,672	—	—	—	—	26,697	2,368	84,512	33,805
'80.	—	—	—	49,493	19,764	—	—	504	—	29,139	2,652	101,552	40,621
'81.	—	—	—	43,164	7,222	337	—	480	—	35,604	3,718	90,525	36,210
'82.	—	—	—	62,898	6,390	13,499	—	798	—	38,288	9,195	131,068	52,427
'83.	21,056	14,280	12,583	47,919	6,901	22,686	1,942	—	—	36,149	3,580	119,177	47,671
'84.	35,037	23,098	16,183	74,318	8,884	22,630	1,958	881	643	38,987	3,618	151,916	60,766
'85.	43,813	43,655	24,762	112,230	24,174	—	18,301	—	—	47,068	4,178	205,952	82,381
'86.	31,161	31,645	21,787	84,593	14,007	—	13,702	—	—	55,320	3,789	171,411	68,565

The military importance of the passage is apparent from the number of ships of war utilising it, and from the noteworthy fact that during the last eleven years troops to the number of 655,547 have paid toll, an average of nearly 60,000 per annum.

The Mussulman pilgrims were not long in perceiving the advantage of the canal, and for the last eleven years an average of over 11,700 passed annually to or from Mecca.

We see also that within the last three years Australian emigration has abandoned the Cape for the canal route.

The increasing employment of this route for the Australian trade is shown by the following figures:—

Australian Ships Passing the Canal.

Year.	Number of Ships.	Tonnage (Official).	Passengers.
1878.....	27	46,248	3,509
'79.....	42	71,600	6,865
'80.....	51	107,552	5,367
'81.....	98	208,570	9,770
'82.....	166	343,006	20,862
'83.....	226	488,733	31,420
'84.....	253	553,558	32,373
'85.....	228	534,432	33,288
'86.....	206	516,638	34,218

On this point the following extract of a letter from one of the shipping authorities of Sydney, for which I have to thank the manager of the Union Bank of Australia in that town, will be read with interest:—

Sydney, 13th June, 1885.

..... "The canal has done great service to Australia, in the constant traffic by the magnificent steamers of the Peninsular and Oriental and Orient steam companies, which each send a steamer every fortnight, bringing in every case full cargoes, together with a large complement of passengers for the different ports of Australia; these steamers return fortnightly by the same route with full cargoes of wool, leather, tallow, tin, copper, &c., which before the opening of the canal would have been conveyed entirely by sailing vessels, the high rate of freight formerly charged by steamers preventing any but extra valuable goods and gold being so shipped.

“ The fine steamers of the Messageries Maritimes, with three or four lines of regular cargo steamers belonging to private firms, keep up a constant traffic between England and the colonies. In addition there is a regular German line from Hamburg *viâ* London, always with full cargoes of general merchandise; the steamers of the private firms generally load coal, here or at Newcastle for China or India.

“ The canal is also used by small steamers built at home for colonial owners, intended for the coasting trade, which are thus saved the delay and danger of the Cape route.

“ The immigration department here also utilises the canal by having Government immigrants forwarded to this colony by large steam vessels through the Suez Canal, instead of the long sea route *viâ* the Cape in sailing ships, to the great benefit in health, comfort, and morality to the emigrants.”

The Australian statistics of foreign trade show that there is still a margin for a considerable increase in the traffic of the canal from this source.

*Foreign Trade of South Australia, Victoria, New South Wales, and New Zealand.**

[In millions (and decimals) of pounds sterling.]

Years.	Imports from			Exports to			Total.
	United Kingdom.	Other Foreign† Ports.	Total.	United Kingdom.	Other Foreign† Ports.	Total.	Imports and Exports.
1875.....	21·3	2·3	23·6	20·2	0·4	20·6	44·2
'76.....	20·1	2·1	22·2	20·2	0·3	20·5	42·7
'77.....	21·2	2·0	23·2	20·4	0·4	20·8	44·0
'78.....	22·5	2·1	24·6	19·8	0·5	20·3	44·9
'79.....	20·8	2·1	22·9	18·0	0·5	18·5	41·4
'80.....	18·9	1·9	20·8	25·2	0·5	25·7	46·5
'81.....	23·8	2·8	26·6	22·4	1·1	23·5	50·1
'82.....	29·1	3·2	32·3	22·8	1·2	24·0	56·3
'83.....	28·0	3·2	31·2	25·1	1·7	26·8	58·0

* Extracted from “ New South Wales Customs Statistics, &c., for the Year 1884.”

† Exclusively of the United States.

The tonnage statistics of these colonies I have not been able to get, but comparing the tonnage of New South Wales for 1883 with the value of the imports and exports, I find that the 56,300,000*l.* of that year would represent

1,100,000 tons imports
600,000 „ exports

and as the total Australian trade by the canal is now 557,000 tons, we may take it that over one-third of the total traffic, import and export, goes by the canal.

The Eastern trade proper—India, China, Straits Settlements, Dutch East Indies, &c.—naturally profited by the canal from the beginning, and in some cases to such an extent that an increase of traffic by the canal can only be looked for in an increase of the volume of trade.

The following interesting figures relating to the canal traffic are taken from a Board of Trade return published in 1883:—

Tonnage, Steam and Sailing, Entered in 1880 in United Kingdom from the East and Australia, Value of Imports, and Proportion thereof by Suez Canal.

	Number of Ships.			Tonnage.			Value of Imports.	Proportion by Canal.
	British.	Foreign.	Total.	British.	Foreign.	Total.		
Totals	1,514	236	1,750	1,810,976	186,615	1,997,591	£ 80,377,706	Per cent. —
Of which by } canal, home- ward	502	30	532	802,813	39,083	841,896	33,758,636	42

Tonnage, Steam and Sailing, Cleared in 1880 from United Kingdom for the East and Australia, Value of Exports, and Proportion thereof by Suez Canal.

	Number of Ships.			Tonnage.			Value of Exports.	Proportion by Canal.
	British.	Foreign.	Total.	British.	Foreign.	Total.		
Totals	1,953	415	2,368	2,389,541	415,617	2,805,158	£ 70,694,062	Per cent. —
Of which by } canal, out- wards.....	718	41	759	1,016,608	46,547	1,063,155	26,863,743	38

Per Cent.

Total of British imports for 1880, 411,229,565 <i>l.</i>	Proportion by canal, 8
„ exports „ 286,414,466 <i>l.</i>	„ 9½

It would be extremely interesting and useful to compile a similar table for 1884, but unfortunately the Canal Company no

longer collects or publishes the detailed statistics requisite for that purpose. We possess however sufficient data to show that the statistics of 1884 must differ essentially from those given above.

The trade, imports and exports, of the United Kingdom with what we will call the canal countries, amounted in 1880 to about 151 million £. Deducting from this say 25 per cent. for subsequent shrinkage in values, this would represent in 1884 a trade of 113 million £; the total of 1884 is however 145 million £, so that the amount of goods dealt in has increased 28 per cent.

The total canal (official) tonnage was in 1880 a little over 3,050,000, and should therefore have reached last year, allowing for the increment of trade, say 3,900,000 tons, supposing that the English trade is fairly representative of the total trade of Australia and the East. The canal tonnage of 1884 was however no less than 5,800,000; there has therefore been an increase of the traffic to the detriment of the Cape route of nearly 50 per cent.

The Board of Trade in the above mentioned report gives the following details of the proportionate traffic of the canal:—

	Per Cent.		Per Cent.
India and China, imports } into United Kingdom.... }	50.	Exports from United Kingdom	45
Australia	17.	„	1'5
Other countries	66.	„	98

	Tons.
Deducting the Australian traffic of 1880, plus the supposed increase of 28 per cent., from } the total of	3,900,000
Say	140,000
	<hr/> 3,760,000
And adding the real Australian traffic of 1884	550,000
	<hr/> 4,310,000

we find that the increase on the India, China, and sundry traffic must be about 1,500,000 tons, independently of the real increase of trade; as however the China trade²³ passed already in 1880 almost entirely through the canal, the increase must be nearly exclusively attributed to the Indian trade.

Of the phenomena following the opening of the canal, one of the most important is the great increase in the Indian trade.

²³ See figures of the Liverpool Chamber of Commerce, quoted in the Board of Trade report aforesaid.

Eastern and Australian Trade of the United Kingdom. Imports from and Exports to the following Countries.

[000's omitted.]

Countries.	Imports.			Exports.		
	1850.	1870.	1884.	1850.	1870.	1884.
BRITISH INDIA.	£	£	£	£	£	£
Cotton, tea, jute, wheat, indigo, rice, hides, wool, coffee, flax, rape, and linseed		25,090,	34,448,	—	—	—
Cotton goods, yarns, iron, machinery, copper, woollens, coal		—	—	7,242,	20,094,	32,062,
STRAITS SETTLEMENTS.						
Tin, spices, cutch, gambier, gutta percha, sago, sugar,		2,547,	4,612,	—	—	—
Cotton goods, yarns, coal		—	—	562,	2,408,	2,816,
CEYLON.						
Coffee, Peruvian bark, cocoa-nut oil, and spices		3,451,	2,367,	—	—	—
Cotton goods, coal, iron, apparel		—	—	218,	941,	782,
CHINA (including Hong Kong and Macao).						
Tea, silk, henip, sugar		9,906,	11,196,	—	—	—
Cotton goods, yarn, woollens, iron, copper, lead	Not obtainable.	—	—	1,547,	9,934,	7,993,
SOUTH AUSTRALIA.						
Wool, wheat, copper		1,243,	3,262,	—	—	—
Iron, apparel, cotton and woollen goods		—	—	418,	915,	2,422,
VICTORIA.						
Wool, sheeps' skins, tallow, wheat, leather, meat, furs		5,782,	7,671,	—	—	—
Cotton and woollen goods, iron, paper, books, hardware and cutlery, leather, linens, beer		—	—	589,	4,687,	7,599,
NEW SOUTH WALES.						
Wool, tin, copper, tallow, meat, leather, hides		3,712,	8,996,	—	—	—
Iron, apparel, cotton and woollen goods, machinery, leather, paper, beer, arms		—	—	1,006,	2,824,	9,391,
NEW ZEALAND.						
Wool, fresh mutton, wheat, &c., tallow, &c., kowrie gum		2,132,	6,015,	—	—	—
Iron, apparel, cotton and woollen goods, leather, hardware, &c.		—	—	112,	1,625,	4,119,
Totals	—	53,863,	78,567,	11,721,	43,428,	67,184,

The increase of 1884 on former years is of course in reality very much greater than appears here on account of the enormous fall in values.

The next important change to be noted is the almost general fall in prices of Eastern produce.

Average Price on Import into the United Kingdom of Articles Exported from various Eastern Countries, deduced from Quantities and Values, in the Years 1870 and 1884.

Countries and Articles.	1870.		1884.	Difference per Cent.
	Computed Value.		Declared Value.	
BRITISH INDIA.				
Cotton, raw..... cwt. £	3'27	2'19	— 33'0	
Indigo..... „ „	35'24	23'02	— 34'7	
Jute..... „ „	19'58	14'13	— 27'7	
Rice..... „ „	10'73	7'83	— 27'0	
Tea..... lb. d.	21'00	14'12	— 32'8	
STRAITS SETTLEMENTS.				
Cutch and gambier..... ton £	18'23	25'16	+ 37'1	
Gutta percha..... cwt. „	14'29	7'22	— 49'5	
Sago..... „ s.	15'56	11'30	— 27'4	
Pepper..... lb. d.	5'20	7'17	+ 36'0	
Tin..... cwt. £	6'31	4'07	— 35'5	
CEYLON.				
Coffee..... cwt. £	3'19	3'89	+ 22'0	
Cocanut oil..... „ s.	39'00	32'40	— 16'9	
Cinnamon..... lb. d.	28'15	10'43	— 66'5	
CHINA.				
Silk, raw..... lb. s.	23'60	14'42	— 38'8	
„ knubs..... cwt. £	15'56	11'36	— 27'6	
Tea..... lb. d.	16'81	10'64	— 36'7	
AUSTRALIA.				
Wool, Victoria..... lb. d.	17'59	13'84	— 21'3	
„ New South Wales..... „ „	16'84	12'61	— 25'1	
„ South Australia..... „ „	8'67	10'34	+ 19'2	
„ New Zealand..... „ „	13'75	12'00	— 12'7	

The last point to be observed is that Europe, Great Britain particularly, has gained another source of food supply in the importation of wheat from India and Australia.

It would be puerile to attribute these various effects to the opening of the Suez Canal. The increase of irrigation works and railways in India and the colonies, the extension of telegraphic communication, the considerable amount of capital now at the disposal of these regions, augmented production and other causes, are likewise factors in the problem, but it cannot be doubted that

the canal, by cheapening freights and shortening distance, is an important element in the circumstances which brought about these changes.

A letter from a gentleman in Bombay, which I owe to the kindness of the manager of the Chartered Mercantile Bank, lucidly sums up the case in the following words:—

Bombay, 21st April, 1885.

. . . . "There is no doubt the trade of the East with
"Europe has been revolutionised during the past ten to twenty
"years, and the opening of the canal has been the most important
"factor in this. At the same time it has been assisted by many
"other things.

"No. 1. The improvements in the construction of steamers, and
"in marine engines, &c., enabling them to run profitably at rates
"which would never have been dreamt of twenty years ago.

"No. 2. The spread and development of railways all over
"India.

"No. 3. The opening of the telegraph line to Europe.

"These have all *expedited* and *cheapened* the cost of carriage
"from the producers in the East to the consumer in Europe. To
"calculate in figures the extent to which this cheapening has been
"carried, and the proportion of it due to the canal, is somewhat
"difficult. We take some however and make approximations.

"1. The merchant or agent works at a much smaller profit or
"commission because he can do (a) a larger business, and (b) with
"greater certainty owing also to the telegraph. These we may
"roughly reduce from 5 per cent. to $2\frac{1}{2}$ per cent.

"2. There is the gain in time say from three to four months,
"equal to a gain of 1 to $1\frac{1}{2}$ per cent.

"3. The gain in insurance (reduced charge) is about 1 per cent.
"also.

"4. When the canal first opened you had to set against these
"the 'higher rate of freight by the canal,' but this we believe has
"now quite disappeared owing to the causes given in heading
"No. 1.

"Perhaps the most important change of all made by the canal,
"has been the greater extent to which it has fostered the direct
"trade from the East to the continental ports, especially the
"Mediterranean ports. All the expenses of depôt, consignment,
"and transshipment are thus saved.

"Every mercantile man knows that there is an advantage in
"the 'quickness and certainty' with which business can be done,
"which increases and indeed makes a trade, and which cannot be
"put in any exact figures or estimates whatever.

“ The export trade from the East is the point of view we have taken above, but it applies also, though in a less degree, to the import trade from Europe.”

We have lastly to say a few words on the trade of the United Kingdom through the canal in contradistinction to the India, China, and Australian trade, from which point of view we have hitherto been looking.

We first notice that great as has been the development of the canal traffic, the English portion thereof has more than kept pace with it, notwithstanding a reaction within the last two years. The following will make this clear :—

*Comparison of the Ratios of Increase of the Total Canal Tonnage and the English portion thereof (Gross Tonnage).** Totals for 1870 taken as = 100.

Ratio of Increase.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.
Total tonnage.....	100	174	330	478	556	674	704	785
English „	100	188	366	518	621	754	810	933
Proportion of Eng- lish to total}	66·4	71·7	73·6	72·0	74·1	74·2	76·2	78·9

Ratio of Increase.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.
Total tonnage.....	755	743	997	1,330	1,635	1,848	1,910	2,061	1,877
English „	909	867	1,191	1,656	2,003	2,121	2,182	2,370	2,162
Proportion of Eng- lish to total}	79·9	77·5	79·1	82·7	81·4	76·2	75·9	76·8	76·43

* 1870. 289,233 English tonnage. 435,911 total tonnage.
 '86. 6,254,417 „ 8,183,313 „

Analysis of Tonnage Statistics of the

(In the proportional tonnage, 1,000 =

		Flags.						
		English.	French.	Dutch.	German.	Italian	Austro-Hungarian	Spanish.
1870	{ Number of vessels.....	314	75	2	—	10	26	3
	{ Proportional tonnage....	664	194	1	—	13	44	2
'71	{ Number of vessels	502	66	5	7	47	63	5
	{ Proportional tonnage....	717	117	9	3	36	51	4
'72	{ Number of vessels	761	80	13	16	66	61	8
	{ Proportional tonnage....	736	113	18	8	33	37	5
'73	{ Number of vessels	813	83	36	28	58	70	17
	{ Proportional tonnage....	720	106	35	17	28	43	15
'74	{ Number of vessels	898	87	53	31	52	61	27
	{ Proportional tonnage....	741	92	44	16	26	35	25
'75	{ Number of vessels	1,061	84	59	35	57	64	21
	{ Proportional tonnage....	742	77	45	15	27	32	15
'76	{ Number of vessels	1,090	89	60	27	51	53	26
	{ Proportional tonnage....	762	77	48	13	27	25	18
'77	{ Number of vessels	1,303	85	63	40	58	46	21
	{ Proportional tonnage....	789	68	45	17	25	22	15
'78	{ Number of vessels	1,268	89	71	23	44	38	21
	{ Proportional tonnage....	799	76	46	9	20	19	18
'79	{ Number of vessels	1,144	93	61	16	52	40	25
	{ Proportional tonnage....	775	81	49	6	29	22	20
'80	{ Number of vessels	1,592	102	70	38	52	60	33
	{ Proportional tonnage....	791	62	41	12	25	24	19
'81	{ Number of vessels	2,251	109	71	45	52	64	46
	{ Proportional tonnage....	827	50	33	10	19	20	17
'82	{ Number of vessels	2,565	165	103	109	61	67	32
	{ Proportional tonnage....	814	57	35	25	21	17	11
'83	{ Number of vessels	2,537	272	124	123	63	67	51
	{ Proportional tonnage....	762	97	39	26	24	17	18
'84	{ Number of vessels	2,474	300	145	130	54	65	46
	{ Proportional tonnage....	759	100	43	29	20	18	16
'85	{ Number of vessels	2,734	294	139	155	109	69	26
	{ Proportional tonnage....	768	91	40	31	25	19	9
'86	{ Number of vessels	2,331	227	127	161	69	77	26
	{ Proportional tonnage....	769	82	40	37	22	24	11

The extent to which English shipping utilises the canal would seem to be the measure of the advantage Great Britain derives from the undertaking. There is however the reverse side of the medal, for the Board of Trade points out, first, that the canal has been prejudicial to our shipowners and capitalists by economising tonnage and saving time, *i.e.*, interest on capital; and secondly, that it has injured our entrepôt trade.

It would be rash indeed in an amateur statist to attempt to criticise the conclusions of the trained experts of the Board of Trade. Moreover, these gentlemen were asked to give direct answers to specific questions, and not to enter into general economic considerations. As however the above objections might

Suez Canal Transit by Nationalities.

total tonnage of any given year.)

Flags.							Total.		
Rus- sian.	Nor- wegian.	Belgian	Egypt- ian.	Turkish.	Danish.	Other States.			
1	—	—	33	17	1	4	486	Number of vessels	1870
1	—	—	51	25	2	3	1,000	Proportional tonnage	
5	1	4	22	32	1	5	765	Number of vessels	'71
6	2	6	17	24	1	7	1,000	Proportional tonnage	
10	6	—	13	33	1	14	1,082	Number of vessels	'72
9	3	—	6	23	1	8	1,000	Proportional tonnage	
9	5	4	7	26	5	12	1,173	Number of vessels	'73
7	5	3	3	10	3	5	1,000	Proportional tonnage	
7	8	1	8	15	1	15	1,264	Number of vessels	'74
5	5	—	2	5	—	4	1,000	Proportional tonnage	
15	10	—	33	19	18	18	1,494	Number of vessels	'75
8	7	—	12	5	8	7	1,000	Proportional tonnage	
14	12	—	12	3	13	7	1,457	Number of vessels	'76
8	7	—	5	1	7	2	1,000	Proportional tonnage	
—	12	2	9	—	15	9	1,663	Number of vessels	'77
—	6	1	2	—	7	3	1,000	Proportional tonnage	
—	5	2	9	3	6	14	1,593	Number of vessels	'78
—	2	1	1	—	3	6	1,000	Proportional tonnage	
7	6	1	12	5	5	10	1,477	Number of vessels	'79
3	3	1	3	1	2	5	1,000	Proportional tonnage	
22	7	1	16	10	10	13	2,026	Number of vessels	'80
10	3	1	3	3	3	3	1,000	Proportional tonnage	
20	10	13	11	11	13	11	2,727	Number of vessels	'81
7	3	4	3	2	3	2	1,000	Proportional tonnage	
18	20	13	21	10	2	12	3,198	Number of vessels	'82
5	5	3	2	2	1	2	1,000	Proportional tonnage	
18	18	12	3	9	2	8	3,307	Number of vessels	'83
6	4	3	1	1	1	1	1,000	Proportional tonnage	
17	18	5	4	4	—	22	3,284	Number of vessels	'84
5	4	1	1	—	—	4	1,000	Proportional tonnage	
29	30	1	7	16	3	12	3,624	Number of vessels	'85
7	6	—	1	1	—	2	1,000	Proportional tonnage	
24	28	1	4	6	1	18	3,100	Number of vessels	'86
6	6	—	—	—	—	3	1,000	Proportional tonnage	

be used without the qualifications which should accompany them, I venture to suggest that the Canal Company would probably answer them in something after the following fashion: "Granted that your shipowners and capitalists may complain that part of their former profits now goes to the shareholders of the canal, but do not forget that the English Government is by far the largest shareholder; that although, for the moment, it participates only indirectly in the profits, by the great enhancement of the value of its investment, this investment has enabled it to press costly improvements upon the Company, whilst the tolls which, year by year since 1878, have been reduced, will, by agreement, continue to fall till they reach one-half of their present amount.

“ True, your investment was a political one, but is it our fault if your merchants, shipowners, and capitalists, usually so sagacious and far-sighted, absolutely set their faces against a great instrument of economic progress, persisting in a bootless opposition, when at any time during the construction of the canal, and long after it was completed and working, they might have become masters of the undertaking at a price far below the stake of the original shareholders, and very far below the actual cost ?

“ Your entrepôt trade has decreased, say you ; your tea trade does not appear to have suffered, the bulk of your cotton and coffee does not go through the canal, and it is not therefore quite fair to hold us responsible for any lessening of your exports of these articles. As to your raw silk trade, it is quite true that the market has to a considerable extent been transferred to Marseilles and Lyons, but the economic movement of the last twenty years tends essentially to eliminate middlemen, to cheapen charges, and to bring producer and consumer nearer and nearer to one another. At a time when the Lancashire spinner deals direct with the American cotton planter, is it astonishing if the spinners of Mulhouse and Winterthur try likewise to avoid paying toll to Liverpool ; if the Elbeuf clothworker looks with longing eyes to Australia for the wool he has so long had to go to London for, and if the Lyons weaver makes every effort to get his raw material close at hand instead of from England ?

“ Is it quite sure that even without the canal this movement would not have taken place, more slowly doubtless, but perhaps with equal certainty ?”

Arrived at this point, there fell under my notice an article in the “ *Deutsche Rundschau*,” entitled “ The displacement of the economic centre of gravity,” which seems so consistent with this view, that I cannot refrain from quoting it. The writer, Herr von Neumann-Spallart, maintains that British commerce, although so immense and progressive, is not keeping pace with the commerce of the rest of the world, or of the continent, and in support of his theory publishes the following figures :—

Comparison of Foreign Trade, &c., of United Kingdom with that of the Rest of the World, and also with that of the Continent.

Foreign Trade.

Year.	United Kingdom.	Rest of World.	Total.	Year.	United Kingdom.	Continent.	Total.
	Per cent.	Per cent.	Per cent.		Per cent.	Per cent.	Per cent.
1867-68	24·0	76·0	100	1867-68	34·5	65·5	100
'74-75	24·0	76·0	100	'74-75	33·1	66·9	100
'82.....	19·5	80·5	100	'82.....	29·0	71·0	100

*Comparison of Foreign Trade, &c., of United Kingdom—Contd.**Production of Coal.*

1868.....	53·6	46·4	100	1868.....	62·7	37·3	100
'76.....	47·4	52·6	100	'76.....	58·5	41·5	100
'82.....	41·6	58·4	100	'82.....	55·7	44·3	100
'83.....	40·7	59·3	100	'83.....	55·3	44·7	100

Production of Iron Ore.

1868.....	44·1	55·9	100	1868.....	51·0	49·0	100
'76.....	48·6	51·4	100	'76.....	55·5	44·5	100
'82.....	39·6	60·4	100	'82.....	53·0	47·0	100
'83.....	39·1	60·9	100	'83.....	52·1	47·9	100

Average Consumption of Raw Cotton.

1871	United States	Mln. lbs.	1856-60	60·3	39·7	100
'71 ...	„ Kingdom ...	505	'68.....	58·3	41·6	100
'83 ...	„ States	1,074	'82.....	52·3	47·7	100
'83 ...	„ Kingdom ...	1,127				
		1,489				

*Transit of Suez Canal.**Estimated Consumption of Wool.*

1882.....	81·4	18·6	100	1876.....	29·0	71·0	100
'83.....	76·2	23·8	100	'82.....	21·0	79·0	100
'84.....	75·9	24·1	100	—	—	—	—

The German economist gives the following as the causes of this reaction: "The exhaustion of the soil and of the mineral wealth of the land is continuous; the advantage of cheapness and excellence of transport is no longer an English monopoly, but the common property of the whole of Western Europe and North America; the riches of the country have led to a diversion of capital to the colonies and foreign countries, where it fructifies. Western Europe and North America have, moreover, accumulated a surplus from their own economical forces, and their national fortunes have increased to such an extent that their regions are becoming more and more on a par with England. The aptitudes of the labouring classes on the continent have been raised by means of reforms and of technical instruction; the division of labour and use of machinery have been extended much more rapidly than was anticipated; nay, a stream of men representing an abundance of excellent and skilled labour flow year by year from Great Britain to the United States, and transfers thither, where, moreover, the Anglo-Saxon race forms the core of

“intelligence, the elements previously in the service of British “industry.”

The picture is probably too black. If English commerce has relatively decreased, it has effectively increased very considerably ; our trade with India, for example, was in 1868 57,375,000*l.*, or 66·3 per cent. of the total Indian trade ; in 1881 it was only 57·9 per cent. of the total trade, but amounted to 72,300,000*l.*, an absolute increase of value alone of 33 per cent. The very immensity of our trade invites attack, and this by protective tariffs and bounties is easy, though more injurious probably to our rivals than ourselves. It is clear, however, that many causes are at work unfavourable to our trade supremacy, and the canal is only one, and by no means the most potent.

What step in material progress was ever taken moreover without bringing loss on some one ?

“Pity, no doubt,” says Mr. Mongredien in a recent Cobden Club tract,²⁴ “that the blessings of an abundant harvest should not “prove an unalloyed good, and that while contributing to the “general benefit, it should bring with it transient evil to certain “classes. But every change in human affairs, however much for the “better it may be, has for immediate effect to transfer demand “away from certain forms of labour and capital on to some newer “forms thereof. Thus, all scientific discoveries and labour saving “inventions, while productive of the greatest permanent benefit “to mankind, temporarily displace labour and capital from some of “their accustomed channels.”

Let us not therefore be too parochial minded. If Great Britain has had to suffer some partial and perhaps temporary disadvantage from the canal, Greater Britain—India, Ceylon, the Straits, and Australia—has a permanent, a great, an increasing gain, not only from an economic but also from a political point of view.

The canal is an instrument of progress, and as such indestructible ; for every step forward is irrevocable. The steam engine, the telegraph, and the telephone might have slept for ages longer in the brains of inventors, but once given to the world they cannot be recalled.

England would not if she could put back the clock for her own benefit, and if the canal were utterly destroyed to-morrow, Englishmen would probably be the first to set about making a new one.

I might fitly end this already too lengthy paper with a panegyric of the founder of the great work which forms its subject, but the canal itself is his best eulogium, and my feeble voice would add

²⁴ “Trade Depression, Recent and Present,” August, 1885.

nothing to his fame. The history of the canal is a history of hard work, and its projector would be foremost in rebutting presumptuous praise, in the words of Carlyle :—

“ My friend, all speech and rumour is short lived, foolish, untrue. Genuine work, what thou workest faithfully, that is eternal, as the Almighty Founder and World Builder Himself. Stand thou by that, and let Fame and the rest go prating.”²⁵

DISCUSSION ON MR. RABINO'S PAPER.

BEFORE the paper was read—

The CHAIRMAN (Sir Rawson W. Rawson), announced that the Council had prepared an address to Her Majesty on the occasion of her Jubilee, felicitating her on behalf of the Council and Fellows of the Society upon the auspicious event, and he was sure that the Fellows of the Society would approve of what had been done.

The address was approved.

(The Paper was then read.)

Mr. C. M. KENNEDY, C.B., said that rather more than thirty years ago he received the censure of a leading English statesman for saying it was feasible to make the canal, and fifteen years later he was glad to be able to act as interpreter between the captain of a vessel passing through and the pilot. He considered Mr. Rabino's statement as generally accurate, but he did not entirely agree with the views expressed in the paper on the subject of the *entrepôt* trade. We must not minimise the effects which the opening of a new channel of international communication will bring about. No regret need be felt with regard to them, but they must be looked at and fairly considered. Sir John Stokes has taken a chief part in the international arrangements relative to the canal, since the conference held at Constantinople in 1873, and he will be able to offer valuable remarks on the paper just read, as well as to explain the arrangements entered into at different periods, and likewise the present position of questions relating to the canal.

Sir JOHN STOKES, K.C.B., thought the paper contained an admirable *exposé* of the past history of the canal, of its inception, the difficulties encountered, and the mode in which the work was carried out. He could not at a few hours' notice undertake to say that all the figures were correct, but he thought from the evident care bestowed on them they could not be far wrong, and that the Society was to be congratulated on having had before them the most complete paper of reference with regard to the Suez Canal that had come under his purview. He had been asked to give an account of the improvements; they really dated from much earlier than the shipbuilders' agreement. By the convention which he

²⁵ “ Past and Present.”

had had the honour to make with M. de Lesseps in 1876, the company engaged to spend 1 million frs. a-year, for thirty years, beyond the ordinary expenditure on maintenance in improving the canal. As time went on the trade of the canal remained nearly stationary up to 1880, in which year tonnage began to increase by leaps and bounds, and as early as 1882 the company was so impressed with the necessity of providing a larger waterway, that of their own accord they decided to spend what remained of the 30 million frs. immediately on works improving the waterway, instead of spreading it over so many years, and that sum was actually expended between the beginning of 1883 and the beginning of 1887. The result has been to widen the canal through the Bitter Lakes from 72 feet to 131 feet at bottom. That increase had almost entirely removed the source of complaint with regard to the grounding of vessels, which generally took place at that point. The shipowners' agreement at the end of 1883 led to the appointment of an International Commission of Engineers, which recommended a series of improvements of a very comprehensive character, that were now on the point of being carried out. Their principal recommendations were that the canal should be eventually deepened by a metre, and that the width of bottom, which was now 72 feet, should be extended to from 213 feet to 278 feet. The company, taking into consideration its financial position, adopted the recommendations of the commission for the first phase of the works to be carried out at once; according to which 15 metres, or 49 feet, is to be added to the width throughout the whole length of the canal in five years, giving at the same time an increased depth of 20 inches, namely, from 26 feet 3 inches to 27 feet 10 inches. The effect of this will be that whenever two vessels are approaching one another, one will draw on one side, allowing the other to pass at any point of the canal, instead of one having to lie in a siding for two or three hours. This first phase of the improvement will cost about 4 million £. The remaining increase of width to 213 feet in some places, 246 feet in others, and 278 feet in the bends, would only be carried out as the tonnage showed signs of increase. It has always been considered that by the time the annual tonnage should reach 10 million tons, vessels should be able to pass right through without a check, passing each other under steam. It might naturally be asked why works decided on in 1885 were only commenced in 1887, but the conditions under which the loan had to be raised and the incidence of its interest adjusted, depended on the assent of the Egyptian Government, and until the end of last year that difficulty was not overcome. Only at the beginning of the present year did the company feel themselves free to commence fresh works. The actual position now was that additional dredging plant to the amount of 1 million sterling had been ordered in France and England; contracts for the dry cutting for the widening had been made; men were now on the work, and it was hoped that next year the new dredgers would set to work in earnest, so that in two years the increased depth would be given. The importance of increasing the depth would appear from the fact that the number of vessels drawing 23 feet of

water had increased from 0·13 per cent. to 21·74 per cent. in 1886. He had found on the part of the Egyptian Government a very deep-rooted opinion that the Suez Canal had injured Egypt from a national point of view. No doubt the large indemnities which the Egyptian Government had to pay the Suez Canal Company might lead to that impression, but the real injury arose from the improvident sacrifice of the royalties, which amounted to 15 per cent. on the net receipts of the company. Those profits were abandoned in 1880 for the whole term of the concession to a French syndicate to cover a debt of 700,000*l.* During the last seven years that syndicate has encashed 1,212,025*l.*, and supposing the receipts of the canal never increased beyond those of the last five or six years, the company would pay to the syndicate 14 million £ sterling up to 1968 for that trifling debt of 700,000*l.* Probably the payment will be three times that amount. He thought the Egyptian Government had no right to complain when they had made such a sacrifice. At the time they did it they had already received 83,618*l.* in five bad years, so that they must have known they had got a very valuable property.

Mr. R. PRICE-WILLIAMS, C.E., said that he had repeatedly passed through the canal, and had taken great interest in the progress that had recently been made in repairing and widening the canal at the curved portions. He was glad to hear from Sir John Stokes that the great work of widening the canal throughout had commenced, but when he passed through a month ago such work as was then being carried out was done in certainly the most primitive way, a large number of Arabs being employed in carrying away the excavations upon their heads and in such a way as would take years to complete the work. One thing was certain, that unless the canal was widened very soon, the limit of saturation of the traffic would be speedily reached. He quite believed from the figures that had been given in the paper, that there were all the elements of continued success in the undertaking if it was widened to three times the present width. He wished to ask Sir John Stokes what would be the increased speed when the canal was widened to the full extent contemplated. He had been pleased to find that during the year which had elapsed since he last visited the canal the work of maintaining the banks had made great progress, very considerable portions having been faced with stone during that time. With regard to the historical part of the paper, some discrepancy appeared in the author's statement. It referred to the concession as having been made to M. de Lesseps in 1854, whereas in a paper read before the Institution of Civil Engineers in 1850, the following passage occurred in a footnote: "Since this paper was written the project for making a ship canal from the Mediterranean to the Red Sea has been revived by M. Ferdinand de Lesseps, to whom the Pacha of Egypt *has granted a concession of the undertaking*, besides subscribing for a considerable portion of the required capital. At the instance of M. de Lesseps, an International Commission of Civil Engineers was appointed to examine and report upon the plans; and under

their direction an exact survey was made of the country, and the levels between the two seas were carefully taken. The result of these investigations has been to confirm the statement of Mr. Robert Stephenson, that the mean height of both seas is virtually identical, and also the opinion expressed by General Chesney as to the engineering difficulties to be overcome." The report of the commission concluded as follows: "It is not our province to judge what motives may have retarded the execution of a work of this character; but we believe we are only echoing the universal opinion in saying that all delay is to be deplored when once a well considered opinion on the subject has been formed. Our object has been to enlighten, as far as in us lay, the Governments of the world; and with all confidence we submit to them the final results of our inquiry. May our labours hasten the moment when all impediments other than those existing in the actual nature of things shall be removed, and when the artificial Bosphorus at Suez may be thrown open to the navies of all nations." Having regard to the opposition which this undertaking had received from Mr. Robert Stephenson, he was glad to find amongst the members of that commission the names of Mr. J. R. McClean, Mr. Charles Manby, and Mr. J. M. Rendel, two of them past presidents of the Institution of Civil Engineers. He thought it only right for the credit of the profession to which he belonged, that it should be known that the leading members of this profession were so far back as 1850 fully alive to the importance of the great work which had been so admirably carried out by the great French engineer.

The CHAIRMAN said that before he left Mauritius, which was in May, 1854, a friend of M. de Lesseps who arrived in the island gave him a coloured lithograph of a birdseye view of the Suez Canal as then contemplated by M. de Lesseps, so that it was evident that the plans had been then formed.

Mr. JOHN GLOVER thought that the story of the canal was almost a romance. The great growth of trade between Europe and the eastern parts of the world was the result of several circumstances, of which the Suez Canal was one of the chief. While contributing a great impetus to some trades, it had had very important effects in other directions on English trade. He was not at all inclined to think that the effects of the opening of the canal were exhausted, especially if the dues were further reduced. Still, many old fashioned methods of money making in the eastern trades had disappeared. Of course many new methods had arisen. The canal had played a great part in the fall in prices. He had always felt that the importance of the canal to England was very much exaggerated, and he was almost inclined to think that Lord Palmerston's original objections were right, and that it would have suited England better if there had been no canal. Englishmen, however, were the chief users of the canal, and as far as he knew neither our Government nor our shipowners had ever asked for any use of the canal, the benefit of which was not to be open to all nations. In time of war its use to us would

be doubtful; it would not only be the canal that they would want neutralised, but the whole of the Mediterranean; so that no scheme of neutralisation of the canal merely would make Mediterranean transit safe to our vessels if we were at war with a first class European State. The Cape route being the safer, would be the likeliest one to be used in time of war. The paper had made it quite clear that so far as finances were concerned the canal was now on a most solid and substantial basis. Sir John Stokes thought that the recent improvements were the result of financial arrangements put into operation in 1876. However that might be, he was happy to be able to state that, since the controversy which took place between the English shipowners and the canal company, and the reduction of the tolls and other charges then settled, everything had improved. Transit was decidedly quicker, and complaints had become as rare as they were previously common, as might be expected when there were ten English directors on the board. Throughout the discussion of some very delicate questions on this matter, the English Government had played a most fair and honourable part. There had been only a proper anxiety to get the best terms they could for all European commerce with the East, but at the same time not to deprive the shareholders who ran the risk of making the canal of any reasonable profit to which they were fairly entitled by its success. In the last negotiation the Messrs. de Lesseps had shown themselves most astute and able negotiators. When it was proved that some changes were necessary to meet the facts, they took a reasonable view of the position, and the matter was settled. With regard to the alleged profit derived by England from the purchase of the canal shares, it is too soon yet to speak. It was not credible that without that purchase English interests in Egypt would have developed as they have done, or that we should have had two wars in Egypt since. The loss of life also could not be left out of the question. It was deeply to be regretted that the Egyptian Government had lost so much of their interest in the canal owing to their financial difficulties.

Sir JOHN STOKES said he had been challenged to answer Mr. Price-Williams on one or two points. Certainly the speed was now very slow, because of the necessity not to wash down the banks; but as the width was increased the wave of displacement would become smaller, and a greater speed would be allowed: 7 or 8 knots an hour would doubtless be permitted when the full width was attained. The time of transit would then be reduced to twelve or thirteen hours. Those vessels that had the electric light could now pass through in sixteen hours. The question of the date of the concession was a very interesting one. The first was in November, 1854. Under that the Council of International Engineers was appointed, and reported in 1855. The second concession was dated 5th January, 1856, and that was the one under which the canal had really been carried out. The sketch that the Chairman saw in 1853 or 1854 was easily explained. M. de Lesseps conceived the idea in 1840 when he was consul-general in Egypt,

and no doubt made a general sketch of his idea; but it was not till 1853 or 1854 that Saïd Pasha, on ascending the throne, summoned M. de Lesseps to come and see him; he joined the Pasha in his expedition to Khartoum in 1854. It was during that journey that he obtained the first permission to carry out the work. The dates in the paper were quite accurate.

Mr. PRICE-WILLIAMS said the signatures of the engineers appeared in the paper read in 1850.

Sir JOHN STOKES said that in his opinion Lord Palmerston's opposition was a most providential thing for the company. It was to the original concessions, which gave the company a large territory, that Lord Palmerston took exception. That territory was resumed by the Egyptian Government on payment of an indemnity, and they now had only the land through which the canal passed. If M. de Lesseps had been able to make it in 1857-62, it would have been a great financial failure, because the ships of those days could not have used it. It was the invention of the compound engine which made the canal a success.

The CHAIRMAN said it was Lord Palmerston's opposition which led the French to support it as they did.

Sir JOHN STOKES said the English Government had never asked for any favour to be shown to the English flag, because the concession said that no flag should have preference over any other. As regarded the observation that the canal was an injury to English trade, he could only say that that trade could pass round the Cape if it wished, but English merchants saw that it was better to turn over their money three or four times a year by going through the canal, than to go round the Cape and only turn it over once or twice; but in case of war with a great country like France, no one would ever think of sending merchant steamers through the Mediterranean to the canal; they must go by the Cape. The whole of the French fleet would have to be destroyed before the canal route could be used. He could bear witness to the extreme desire of the English Government not to press unfairly on the canal company. They had never interfered with the enterprise in any way except to keep the company to their legal bond.

The CHAIRMAN regretted that M. Charles de Lesseps had not been present to hear the testimony that had been borne to his honoured father, the founder of the canal. He himself could not add to the information that had already been given, and would therefore simply propose a vote of thanks to Mr. Rabino, who had previously given them a valuable paper on the finances of Egypt. He was sure the meeting would also join in a vote of thanks to Sir John Stokes for the interesting supplement that he had given to the paper.

The votes of thanks were agreed to, and the proceedings terminated.
