

THE SUEZ CANAL.

Description and History of the stupendous Work.

The maritime canal across the Isthmus of Suez, which can be compared with regard to the importance of its geographical position only to the Isthmus of Panama, is completed. A dispatch, dated Alexandria, September 30th, announces that Ferdinand de Lesseps, the founder of this gigantic work, had performed the passage from Port Said to Suez on a steamer in fifteen hours.

DESCRIPTION OF THE CANAL.

The width of the Isthmus of Suez, from Tineh (the ancient Pelusium), which lies under 31° 3' 37" to Suez in 29° 58' 37", is seventy miles in a direct line. The length of the canal from Port Said to a point a little south east of Suez, is exactly 100 miles, sixty of which pass through three lakes Menzalah, Ballah, Timsah, and the Bitter lakes. Embankments were constructed only upon the lakes Menzalah and Ballah, and not upon the last two named. The width of the canal, at the water line, varies from 100 feet two inches, to 492 feet. The width at the water line, of about four-fifths of the entire canal is 328 feet. Between the fortieth and forty-seventh miles, where the excavations were very difficult, the canal is only 190 feet wide. The width of the channel bed is not less than 72 feet anywhere; near Port Said it is from 120 to 130 feet, and near Suez from 262 to 311 feet. The depth of the canal is not less than 26 feet 2 inches, but between the Bitter lakes and Suez the depth is from 28 feet 5 inches to 32 feet 8 inches.

PORT SAID.

The canal commences at Port Said, on the Mediterranean, which city has derived its name from the said Pacha. It was founded by the canal company of 1859, on a narrow, uninhabited strip of sand, which was enlarged by sand from the harbor dredgings. Port Said lies not far from Damietta, a town near the mouth of the eastern arm of the Nile. In 1853 there were only a few tents for the engineers, and a few huts which were built on piles, where the city now stands. Provisions and water were at that time brought on camels from Damietta, or by vessel, at a distance of thirty-five miles. Port Said has now 12,000 inhabitants, and its trade is increasing rapidly. In 1868 not less than 266 steamers, chiefly belonging to French, Russian, Austrian and Egyptian companies arrived at Port Said. The inner harbor of Port Said, which is called the *Grand Bassin du Port*, is large enough for 400 first-class merchant men. Besides the large basin there are two smaller ones; one of these is called the basin of Commerce, the other the basin of Arsenal. Any enlargement of the inner port if such should be necessary, will be into the lake Menzalah, consequently toward the south.

From Port Said to El Kantara, which means bridge, a distance of twenty-seven miles, the canal traverses the lake Menzalah and its lagoons. This lake, whose bottom consists of the deposits of the eastern arm of the Nile, is shallow and muddy. The embankments on this section of the canal have been formed out of the dredgings. The steam dredging machines which have been employed on the Suez canal are the largest and most powerful ones which the world has ever seen; they are 131 feet long, 21 feet wide; their elevation is 46 feet, and their weight 1,100,000 lbs each.

From el Kantara, the canal passes to the small lakes Ballah. Between these lakes and lake Timsah, Crocodile lake, the construction of the canal was exceedingly difficult, particularly at El Ferdane and El Guir. The immense dune at the latter place, through which the canal had to be cut, is from 60 to 70 feet high. The height of the embankments of the canal, at El Guir is 62 feet.

Previous to the construction of the canal, the shallow basin of Timsah—which was dry during the hot season—was fed only by the inundations of the Nile. The filling of lake Timsah, by water from the Mediterranean, lasted five months, and required 64,000,000 cubic meters of water, (a meter is equal to 39.37 English inches). Lake Timsah covers nearly 5,000 acres.

The new town of Ismailia, which has derived its name from the present Viceroy of Egypt, lies on the north side of lake Timsah. It has now 5,000 inhabitants, and makes the impression of a European city which has been transferred to the Orient.

When the fresh water canal was completed, the Egyptian government bought it of the Suez Canal Company for \$2,000,000 gold.

From the south side of lake Timsah the canal passes through the table land of the Serapeum, and then enters the Bitter lakes. The construction of the canal, from lake Timsah to the Bitter lakes presented extraordinary difficulties on account of the sandy condition of the soil. The ground through which the canal had to be cut is almost

33 feet above the level of the sea, consequently 59 feet over the bottom of the canal.

It is proposed to plant trees on the banks of the canal at El Guir, as well as at Serapeum, for the purpose of preventing the filling up of the same by the drift sand. It remains to be seen whether this remedy will be sufficient. The annual expense of dredging out the drift sand at El Guir, and at Serapeum is estimated at \$200,000 gold.

The mouth of the canal at Suez is protected by a dam against the winds and tides of the Red Sea. Suez is the Red Sea port of the large steamers of the British, French and Turkish lines, and it is also an important station for the Egyptian men-of-war.

Near Suez silver and copper coin have been found, which have not been current for 1500 years. The Suez Ship Canal is the only one which has ever been constructed without gates or locks, and it is by far the largest and deepest canal which has ever been made. Besides the Suez canal, there are only three water ways of some extent through which first-class ships can pass, the Caledonian Canal, the Great North Holland Canal, and the New Amsterdam canal. There is no tide in the Bitter lakes, and only a slight movement of the water is perceptible. When the sun shines, the color of the water will indicate the course of the channel.

MOHAMEDAN CONTROL CONSIDERED.

Fears have been expressed that the interests of the commercial world might suffer, on account of the location of the canal in Egyptian territory, and propositions have already been made to neutralize the canal. Should the Egyptian or Turkish governments ever attempt to hinder the free passage of ships through the canal, or otherwise lay obstacles in the way, it will be an easy matter for the European powers to wrest it from Mohammedan rule.

CAPACITY OF THE CANAL.

The depth of the Suez Canal will be sufficient for ships of 3,000 tons. The company announces that ships must not draw more than twenty-four feet, and that all sailing vessels of more than fifty tons will be towed. Pilotage will likewise be obligatory for vessels of more than 100 tons. The towing and pilotage will be done by the company. The maximum speed is to be but little more than six miles per hour. The dues for pilotage vary from five to twenty francs, according to the draught. Vessels towed are entitled to a reduction of 25 per cent. The charge for towage, which is to be done by steam-tugs, will be two francs per ton. Vessels staying longer than twenty-four hours at Port Said, Ismailia, and Suez, have to pay anchorage dues of five centimes per ton for each day. The transit dues will be ten francs per ton, and ten francs for each passenger. It will be seen by this that the charges for a vessel of 800 tons amount to \$2,000 in gold, except those for passengers. This is rather high, and the expense can probably only be borne by costly cargoes. The canal will have the same level throughout.

PLAN, ETC.

The canal is to remain the property of the company for ninety-nine years. After that time it will pass into the hands of the Egyptian Government.

The Suez Canal is no doubt a success. This has been conceded even by the opponents of the enterprise. The modern technical science which has been able to construct the canal, will also be able to keep it in good condition. The Suez Canal, which is one of the greatest achievements of the age, if not the greatest, is a work of peace. And when future generations will feel the blessings of this great work of peace, they will praise Ferdinand de Lesseps, the founder of the Suez Canal.

LESSEPS AND HIS LABORS.

The idea of piercing the Isthmus of Suez by a ship canal originated with Ferdinand de Lesseps in 1831. This remarkable man, who is the son of Mathieu Maximilian Prosper, Count of Lesseps, was born in Versailles, in France, on the 19th of November, 1805. Like his father, he entered upon a diplomatic career at an early age. In 1825 he was attached to the Consulate of Lisbon, and in 1828 to that of Tunis, and he was successively Consul at Cairo, Rotterdam, Malaga (1837), and Barcelona (1842). While he was attached to the French Consulate General in Egypt, he formed an intimate acquaintance with Said Pacha, son of Mehmet Ali, who was Viceroy of Egypt from 1806 to 1849. Said Pacha, who was educated by a French tutor, was an accomplished and kind hearted gentleman. After the revolution in February, 1848, Lesseps was recalled from Barcelona, and soon after he went as French Ambassador to Madrid. In 1849 he was sent as special agent of France to Rome, but he was not satisfied with the French occupation of the Eternal City. He ever protested publicly against the bombardment of Rome by General Oudinot, in consequence of

which he incurred the displeasure of the French Government. Lesseps accordingly retired from the diplomatic service; but a man of such activity of mind could not remain idle.

Early in 1854, Mr. Lesseps returned to England. A few months previous to his return, Said Pacha had ascended the throne of Egypt, in consequence of the murder of his nephew, Abbas Pacha. Lesseps was received in a most friendly manner, and with almost princely honors by his former companion, the new Viceroy. A palace was placed at his disposal, and a number of Egyptian servants were ready to obey his orders. Lesseps asked the advice of the diplomatic representatives of foreign powers with regard to his plan to cut through the Isthmus of Suez, but he met with little encouragement. Hon. Frederick Bruce, the English Consul General, Mr. Sabatier, the French Consul General, and also the representatives of Russia, Prussia and Austria, pronounced his plan fantastic and visionary. However, Mr. Ruyssenaers, the Dutch Consul General, entertained different views.

Lesseps had to surmount innumerable difficulties. The execution of his plan was retarded by the jealousy of the Turkish and English Governments. The Viceroy was continually assailed by interested parties; protests and warnings poured in from all sides. The British Government was afraid that her position in Egypt would suffer, and that the security of her East Indian possessions was threatened.

How Phosphorus is made.

The earthy matter of bones consists of three equivalents of lime united with one equivalent of phosphoric acid, it is what chemists term "a tribasic phosphate of lime." Phosphoric acid consists of one equivalent of phosphorus united with five equivalents of oxygen. In order to obtain the phosphorus it is only necessary to take away those five equivalents of oxygen, which we can do by mixing the compound with charcoal after some preliminary operations, and heating them together. The charcoal takes away the oxygen and forms carbonic oxide with it, while the phosphorus distills over. In this way we get phosphorus in the condition in which you are very familiar with it. It is a wax-like substance, which must be handled with care, because if you allow it to dry, the heat of the fingers would be sufficient to inflame it.

Now observe what this substance looks like. It is semi-transparent; it is soft; you can cut it like wax. It is exceedingly poisonous, and in the making of lucifer matches it is found to be a very insidious poison. Lucifer match makers are apt at first to be subject to an affection which does not draw much attention. They complain frequently of tooth-ache, but they do not know the insidious disease that is creeping upon them. The lucifer match makers who make lucifer matches from this phosphorus, are subject to the most distressing of all diseases; the jawbone becomes destroyed, and frequently disappears or becomes useless, and some of them spend the greater part of their lives in the wards of hospitals. It therefore became an important point for science to find some way by which this phosphorus should be deprived of its poisonous properties without losing those chemical characteristics which makes it so useful in making matches for instantaneous light.

Prof. Schrotter, of Austria, met this want of science in a very skillful way as follows: By taking common phosphorus and exposing it for some time to a temperature of 465°, this yellow, waxy, transparent substance transforms into a dark, brick-like substance. It is no longer so inflammable as to ignite spontaneously. It may be packed up in boxes without danger of spontaneous combustion; but what is more important, it has lost all its poisonous properties. The phosphorus, which was poisonous before, is no longer poisonous in this condition, and it is still capable of being used for making lucifer matches.—*Scientific American*.

ALASKA WEATHER.—For the benefit of those who have never lived in Alaska, and who have been led to believe that the Territory is one "unconditional ice-field," the *Sitka Times* publishes below, the mean observation of the Meteorological Register table, as computed by J. A. Tonner, A. A. Surgeon, U. S. A., of that department, at the hours of 7 A. M., 2 P. M., and 9 P. M. of each day:

Date.	Thermom- eter.	Hygrometer.	Rain fall.
Nov. 6th.	34° 54' 33"	33° 51' 32"	0.00
" 7th.	31 51 34	30 50 33	0.00
" 8th.	33 45 38	32 43 35	0.00
" 9th.	41 44 45	40 43 44	0.20
" 10th.	46 50 48	44 48 46	0.00
" 11th.	45 43 40	43 40 38	0.40
" 12th.	43 42 43	41 41 41	0.75
Total.			1.35

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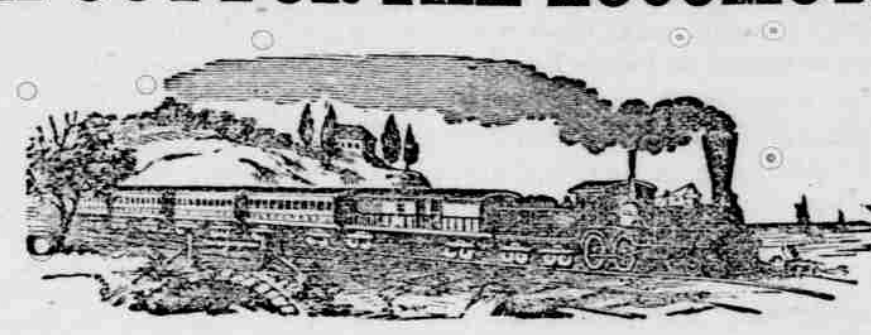
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