organism, and emphasizes its differences under cultivation from any of the other bacteria yet compared with it, paying especial attention to the bacillus of Finkler and Prior. To emphasize the difference still more, he gives figures illustrating the different appearances of the cultivations of the two organisms, and the different ways in which they liquefy the culture-material (*nahr-gelatin*). This work of Johne's is of such special interest just at present, that we feel justified in announcing that it may be purchased in separate form of C. W. Vogel, in Leipzig.

Buchner (*Münch. ärztl. intell.*, 1885, 549) finds a constant difference between Koch's and Finkler and Prior's organisms under cultivation, and adds his testimony to the effect that confusion of the two should be impossible. Doyen (*Soc. biol.*, Dec. 13, 1884) gives an account of various forms of bacteria, observed microscopically and under cultivation, in seven cases of cholera. These were found in the liver and kidneys; but as no data are given as to when the post-mortem examinations were made, how soon after death, etc., and as no inoculation experiments are as yet announced (as far as we have seen), the author is hardly justified, from these observations alone, in heralding 'the end of the reign of the comma bacillus.'

Pettenköfer's challenge to Koch, for it really amounts to that (*Deutsch. med. wochenschr.*, 1884, 818), has not yet been accepted, as, for various plain reasons, it probably will not be. This was, in effect, to produce twenty or one hundred volunteers besides himself as subjects for experimentation, to allow a preliminary gastro-intestinal catarrh to be produced, and then to swallow any reasonable amount of a pure culture of the cholera bacillus. Such a challenge as this may be effective, but naturally is not scientific for the reason that no such experiments can be carried on with precision.

Turning to subjects not immediately connected with the discussion of the specific bacterium of cholera, there have been some contributions to the literature of the subject worthy of attention. Villiers (*Comptes rendus*, 1885, 91) speaks of an alkaloid (ptomäine) found in the cadavers of two persons dead of cholera. It was found in notable quantity in the intestines, and in much less amount in the kidneys, liver, and heart's blood. It is liquid, has an acrid taste, and a distinct odor of hawthorn. It is alkaline, and an active base, set free by alkalies, but not by the alkaline carbonates. Iodide of mercury and of potassium give a white precipitate with its solutions and those of its salts. Picric acid gives a yellow, and chloride of gold a yellowish-white precipitate. Concentrated solutions give a white precipitate with tannin and bichloride of mercury, but chloride of platinum and bichromate of potash give no precipitate. Ferrocyanide and perchloride of iron give a very slight and slowly appearing precipitate. Sulphuric acid placed in contact with the alkaloid gives a very faint and quickly disappearing violet color. The chlorhydrate of the alkaloid is neutral to litmus-paper. It crystallizes in long fine transparent needles, which are exceedingly deliquescent.

Then follow certain physiological experiments, limited in number by the small quantity of the alkaloid at command. The effects produced were a remarkable variation of the pulse-beat, contractions of the limbs, anorexia, and death in four days, of the animal experimented upon (rabbit). Apparently the author did not look for the reproduction of the ptomäine in the body of this animal, — an experiment which would have been of interest as tending to show whether it were connected with the growth of any special micro-organism. The author proposes to continue his investigations as to the occurrence of other special alkaloids in acute diseases, especially in typhoid-fever. He offers a pregnant suggestion in this connection, that, if it turns out that these diseases terminate by the formation of these poisons (ptomäines) in the system, it may be possible to administer antidotes continuously until the cause of their production has disappeared, — thus, for cholera, the continuous administration of iodine-water to form an insoluble compound with the alkaloid; or, if this prove too irritating, the iodide of starch might be used.

Rivière (*Comptes rendus*, 1885, 157) gives a short statistical review of the cholera epidemic in Paris. From Nov. 4, 1884, to Jan. 15, 1885, the dates of the first case admitted and the last discharged from the Paris hospitals, there were 1,080 cases, — 636 males and 444 females. From these a small number must be deducted for errors of diagnosis. There were 587 deaths, or 54.15%. Of the men, 340 died, or 53.46%; and of the women, 247, or 55.63%. These figures reduce the percentage, as given in *Science* (v. 33), somewhat, but at the same time show that the mortality was no lower than usual in epidemics of cholera, and certainly not so low as has been indicated.

Pouchet (*Comptes rendus*, 1885, 220) speaks of the results of investigations upon the modifications undergone by certain secretions under the influence of cholera. He worked upon the bile, the dejections of the cold period, the urine, and the blood. He gives some further account of the ptomäine spoken of above, and a very interesting history of its poisonous effects upon himself during its preparation.

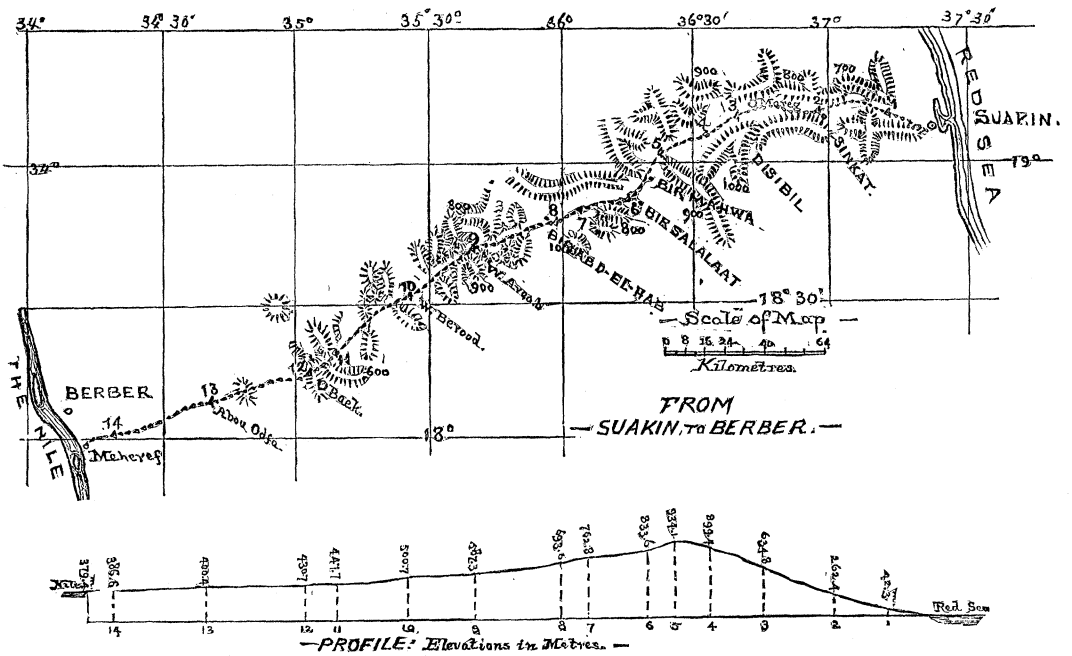
FROM SUAKIN TO BERBER.

SINCE the repulse of the English forces on the march to Khartum by the way of the Nile, attention has been drawn anew to the possibility of constructing and operating a railroad-line from Suakin to Berber. A line of some two hundred and fifty miles in length would easily bring the produce of the Sudan to a seaport. And the reasons why it has not been constructed heretofore are stated to be, that "Egypt had no navy. The khedive did not wish to put the key to the Sudan in the hands of the sultan, or of England, or Italy; nor did he wish the commerce of the Sudan to be diverted from the Nile valley." The military necessities of the situation have now, how-

ever, caused England to set about the undertaking; and work on the road has begun. The gauge, after some discussion of the relative merits of three feet, three feet six inches, and other widths, has been fixed at four feet eight inches and a half, probably with a view to permanency. It will be necessary to use iron sleepers, as the ants destroy wood rapidly.

The question of a water-supply on the route is a very important one. Col. H. G. Prout, an American engineer, formerly in the employ of the khedive under Gen. Stone as chief of the geographical and topographical section in the general staff bureau at Cairo, describes. From his communication the following points are condensed: —

Two miles inland from Suakin are wells which yield the only water for the town. For fifteen miles the route lies over a plain of gravel and small bowlders, and rises about eight hundred and fifty feet above the sea in that distance. A number of shallow beds of water-courses cross this plain, dry except for short and infrequent periods, as there is often no rain for two or three years. There is no vegetation, except some small acacias six to twelve feet high. In this distance wells are found at two places, each sufficient



contributes to the *Engineering news* of March 7, 1885, an account of a reconnoissance of the Suakin-Berber route made by him in April, 1875, and gives a map and profile of the route, the essential features of which are reproduced here. This profile is stated to be the first one published outside of Egypt; and the *Manchester guardian* speaks of his report as giving the best information possessed in regard to the line. The survey was made with care; the longitudes of the termini were taken from the best maps, and checked by chronometer; the latitudes were determined by his own observations; the line of the route was kept by prismatic compass-bearings and by marching-time; observations for altitude were made with two aneroid barometers, and carefully reduced. As the survey was made in April, and as there had then been no rain for two years, the English will now find much the same condition of things as that which he

for from three hundred to five hundred men and their animals. Then the line enters the mountains, and passes for five miles through a valley varying in width from one or two miles to the bowlder-bed of a mountain torrent. Here at Sinkat, a thousand feet above the sea, are the wells of Hambuk, — water-holes three feet deep, filling slowly, and kept drained by two hundred men and their horses, and three hundred camels. Thirty-two miles from Suakin is the divide between the valleys of Sinkat and O-Mareg, sixteen hundred feet above the sea, and presenting the first difficulty in building a railroad, as for some miles the pass is narrow and crooked, and the grades steep. Masonry to protect the road-bed from the torrent will be required, and rock-cutting may be necessary. The defile is a very bad one to pass in the face of an enemy. Thence the route lies through small valleys, with a growth of low trees and shrubs for

thirty miles, passing wells sufficient for one hundred or two hundred men only, and reaching, about sixty miles from Suakin, beyond Wady Ahmed, the summit of the line, three thousand feet above the sea, — a short but steep and narrow pass, and the most formidable obstacle on the route. Some heavy cutting will be unavoidable, unless another pass can be found. Wells at sixty-two and seventy-five miles from Suakin furnish a large quantity of good water. This portion of the route lies through barren, treeless valleys, strewn with fragments of trap and porphyry. At eighty-seven miles from Suakin is a steep, winding pass, altitude about twenty-five hundred feet above the sea, the last point offering any difficulty for a railroad. Nine miles beyond is the good well of Abd-el-Hab; and then, excepting two or three insignificant water-holes, we find only barren plains and low granite hills to Wady Ariab, — a hundred and eighteen miles from Suakin, and nineteen hundred feet above the sea. Here there is a genuine oasis, with good grazing. Twelve miles beyond, the mountains decline, and the route passes over barren plains for forty-two miles to the sand-dunes of O-Baek, about five miles across, where can be obtained a little water. In the preceding fifty-four miles there is no water. From O-Baek to the Nile, sixty-eight miles, stretches a stony plain without tree or herb, and with no water except at one good well two hours' march from the Nile. For seventy-five miles from Suakin, at no one point could a force of two thousand or three thousand men, with their animals, find sufficient water; and, after leaving Bir Ariab, there are two absolutely waterless stretches of fifty miles each.

To supply the water for the workmen while constructing this railroad, and for the troops which will be needed as guards, as well as to provide for the permanent working of the railroad, a pipe-line is at once to be laid, to consist of two lines of four-inch pipes, with stations every twenty-five or thirty miles, at which pumps will be connected with power sufficient to force the water, under a pressure of some one thousand to fifteen hundred pounds on the square inch at the pumps, so as to give a flow of about a hundred and fifty gallons per minute. The pipes will be laid in curves to allow for expansion from the excessive heat. The pumps are to be supplied by H. R. Worthington of New York, who has had great success in pumping petroleum through pipe-lines in this country under similar circumstances of distance and elevation to be overcome. In some cases their pumps have forced oil over a hundred miles without the assistance of intermediate stations. They are to be delivered in London in thirty days from the date of the order. It is also reported that the contract for laying the pipe has been offered to a New-York contractor of experience in that work, and that a man in Winnipeg, once an officer under Gen. Wolseley, and skilled in American methods of rapid railway-construction, has offered to build and guarantee the opening of the railroad from Suakin to Berber within five months from the signing of the contract.

Our enterprising countrymen are also urging upon the English government the advantages to be gained by the use, on the Nile, of the small, stern-wheel, light-draught steamboats so commonly employed on our western rivers. These boats are equipped with powerful capstans and warps for hauling them up rapids, as well as derricks for working off or over sand-bars, and can be rapidly built in the western yards and shipped in sections, or can be built abroad from plans.

THE TOPOGRAPHY AND GEOLOGY OF THE HUDSON-BAY REGION.

From Dr. Bell's report of the geological work of the Hudson-Bay expedition, we learn something respecting the topography and geological formation of that region. In passing northward along the Labrador coast, the land ascends until within seventy miles of Chudleigh, where a height of six thousand feet is reached: beyond this point it again descends gradually to the cape, which has an elevation of fifteen hundred feet. The highest land of the peninsula seems everywhere to lie close to the coast, with a gradual slope westward down to the comparatively flat basins of the Koksok, and the rivers emptying along the east coast of Hudson Bay. The coast of Labrador, like that of northern Europe, is indented by deep and narrow fiords, and in some places has shoals extending out about five miles. In the strait the coast-line appears to be less irregular, the coast is lower, the hills more rounded, and the country devoid of timber, of which the northern limit barely reaches Ungava Bay.

Throughout northern Labrador and the strait the formation is of gneiss, most of it Huronian, but some of it, perhaps, of Laurentian age, varying in color from gray to red, traversed at some points by dikes of trap, at others by veins of quartz, accompanied by the rock-formations usually found associated with such gneiss, and containing minerals characteristic of the formation, such as labradorite, anorthosite, calc-spar, iron-pyrites, and mica and felspar crystals. No economic minerals were found *in situ;* but at Ashe's Inlet some Eskimo from the eastward brought with them plates of good light-colored mica, pieces of pure foliated graphite, and one of amorphous graphite, all of which they said could be had in large quantities. On being shown specimens of minerals likely to occur in the formation, they recognized a bright-red hematite as existing inland, as well as a coarse variety of soapstone, which had been used for making pots; they also knew quartz, which they distinguished by its superior hardness from specimens of marble and gypsum shown them.

At Stupart's Bay, beaches of shingle may be seen at all levels, up to the tops of the highest hills in the vicinity, all as fresh-looking as those on the present shore, except that the stones are covered with lichens. At Port DeBoucherville the gneiss lies in island-like hummocks, the valleys being filled with bowlder-clay, which has a structural arrangement parallel to the walls, apparently due to a process of expansion, con-