

The facts that have just been stated explain approximately the condition of the Panama Canal project up to the time when it was espoused by M. de Lesseps aided and abetted by a Committee of the Académie des Sciences and other French authorities, some six or seven years ago. According to a report made in 1880 by the Académie des Sciences, the narrowest part of the Isthmus of Panama is thirty miles and a half from the town of that name between the mouth of the Bayano and the Bay of San Blas, on the Atlantic, but the diversions rendered necessary by the configuration of the ground will add about sixteen miles to that distance in the total length of the canal. The floor of the canal, elsewhere than in the Culebra cutting, is 72ft. wide, being the same as that of the Suez Canal. The depth of water is from 26ft. to 29ft. In the cutting through the Cordilleras the sides of the rock are at a slope of 1 in 4½, the width at the bottom is 78½ft., and the depth of water is 29½ft., for additional margin of security in the cutting. The total quantity of cutting is estimated at 100,000,000 cubic yards, of which nearly one-half is in rock. The rise and fall of the tide at the north varies from 7½in. to 19in., and at the south from 8ft. to 21½ft. The Technical Commission appointed to examine into the subject estimated the total cost of the works at about £34,000,000 sterling; but MM. Couvreur and Hersent, the contractors, have calculated that the cost will not exceed £20,500,000 sterling. From an engineering point of view, the most serious problem to be solved in the construction of the Panama Canal is the control of the floods of the River Chagres, so as to prevent the canal from being damaged during the rainy season. For this purpose a dam 131ft. high is being made at Gamboa, near Cruces, and this structure, damming the valley through which the river flows, will be the means of retaining a vast lake of over 1,000,000,000 cubic metres capacity, which M. de Lesseps has stated to be much above the amount furnished by the greatest floods. The problem otherwise, as stated by M. de Lesseps himself, is "reduced to these terms—the utilization on the Atlantic side of the Valley of the Chagres, and on the Pacific side of the Valley of the Rio Grande, the beds of both rivers consisting of alluvium, easily removed by excavation." A ridge of high ground, eight miles and three-quarters across and 147ft. in altitude, separates the two valleys, and this the canal has to traverse. The principal cutting will thus be carried over about nine miles of distance to a depth of nearly 150ft.

The port of entry of the canal at Colon, on the Atlantic coast, is being excavated at Fox River, where a temporary port has been established for the reception and storage of material. From this point the canal, skirting the morass of Mindi, passes into the valley of the Chagres at Gatun, whence the line follows the valley to San Pablo, between the railway and the river, on the left side, cutting the river at several points, and crossing the railway at San Pablo. Thence the line of the canal passes to Matachin, cutting many bends of the river *en route*, and following generally the right bank, which is quitted at Matachin, where the canal enters the valley of the Obispo. The river at Matachin, at low water, is 44ft. above the level of the sea. The average fall of the bed of the river is only 1 in 3,300. In the valley of the Obispo the surface is very irregular until Emperador is reached, at 200ft. above sea-level, and two miles and a quarter from Matachin. The line through this cutting has been laid out with curves of about one mile radius. The canal has a total length of forty-six miles.

That real progress has been made with the canal works is admitted by those who have the best opportunities of judging from actual observations on the spot. Operations have actively been commenced on twenty-one sections of the undertaking, which are under four divisional engineers, three of them French, and one a Swiss. Up to the middle of 1884 the Canal Company had expended between £6,000,000 and £7,000,000 sterling, of which £4,000,000 were represented by plant, £300,000 by house property, and £40,000 by land, not, however, including the 120,000 acres conceded to the company by the State of Colombia. Since 1884 the expenditure incurred on the canal works has been considerably increased, six dredges of the Slaven type having been purchased at a cost of £25,000 each; and it is not without interest to note that these have been made in Philadelphia. Many thousands of negro, Chinese, and other labourers are now, and have for some years been, employed on the canal works, and at both Colon and Panama there are evidences of great prosperity. A great drawback is the unhealthy character of the climate, which is such that Europeans readily fall victims to malignant typhus and yellow fever. Attempts are now being made to effect sanitary improvements all along the line of route.

It does not seem as if M. de Lesseps and his friends had reason to hope for much support or sympathy from American commercial circles in their great work. The latest report of the New York Chamber of Commerce states that "the progress so far made in the construction of the canal across the Isthmus of Panama by the French company has been so insignificant, and the expenditures already made are so large, that there exists no longer any prospect of seeing that work finished within a reasonable time, while there is a great probability of that company being obliged to suspend operations for lack of funds long before the work can be half completed." It is also declared to be probable that "the enormous expenditure required to complete that work would render it impossible for that company to establish tolls for the use of their canal low enough to render it practically useful to the commerce of the world." Holding such opinions, the United States Government has been led to conclude a convention with the Nicaraguan Government, securing for a certain period the right of constructing a canal across that part of the isthmus. Herein they checkmated the company of which M. de Lesseps is the head, seeing that it was part of their scheme to endeavour to obtain from the Nicaraguan Government a transit concession which would prevent the competition of any other country or company across Nicaraguan territory.

It is, of course, the United States of North America and the countries on the Pacific seaboard of South and Central America that are likely to be most profited by the Panama Canal. The trade between those countries has of late years very greatly increased, as the following figures, collated from the official returns of the United States External Commerce, will show:—