spirit with which the change in the commercial routes was accepted. Venice made no attempt to use the Cape route, and did all she could to prevent others from taking advantage of it: England, though by a natural instinct she opposed the construction of the canal, was one of the first to take advantage of it when opened, and, so far as the carrying-trade is concerned, she has hitherto successfully competed with other countries."

It is hardly possible to imagine what the effect of the American canal will be. Its influence is likely to be undervalued in Europe, as it will undoubtedly far more benefit the United States than European states. It will undoubtedly cause a revolution of the Eastern carrying-trade, and wrest from England's hand the profit obtained by distributing many Eastern goods over Europe and America.

The importance of geography, and more especially of commercial geography, has recently been emphasized by many English writers, and nowhere has this science more ably been advocated than in C. W. Wilson's address, from which we quoted above. If this science is important to England, it is even more important to us who have to develop the unknown resources of our vast territory. There can be no doubt that from an intelligent pursuit of this science great benefits would accrue to the welfare of our country.

THE LOCATION OF THE NICARAGUA SHIP-CANAL.

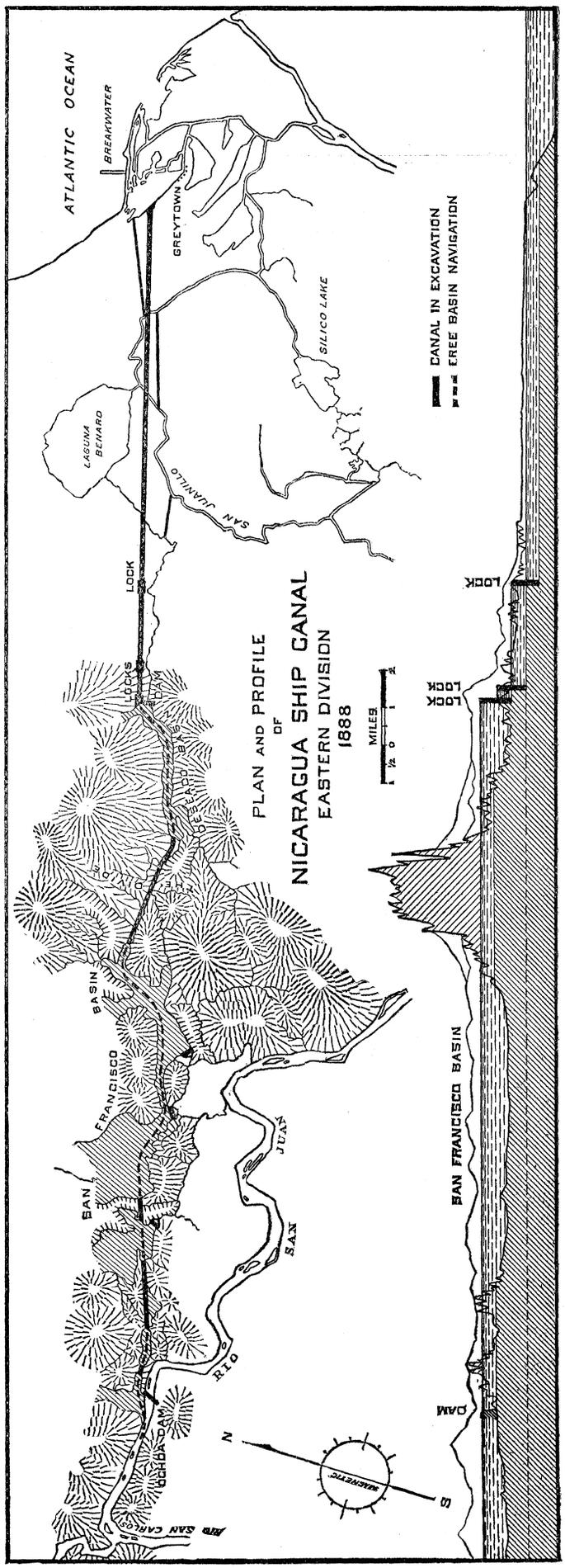
THE result of the surveys for the final location of the Nicaragua Canal, just completed by the Nicaragua Canal Construction Company, are highly satisfactory, and confirm with marked precision the great advantages, in both a financial and engineering point of view, claimed for the route recommended after the survey of 1885. Limited time and insufficient force for extensive field-work made a portion of that survey preliminary in its character; and, while the route selected was regarded as perfectly practicable, yet there were important details of construction and possibilities for improvements which could only be definitely settled by a more exhaustive examination of the newly traversed ground.

It has been the object of the last surveying expedition to eliminate all those doubtful elements, and to perfect the final plans for the work, from the Atlantic to the Pacific, before the scheme is finally presented to the public by the promoters of the enterprise.

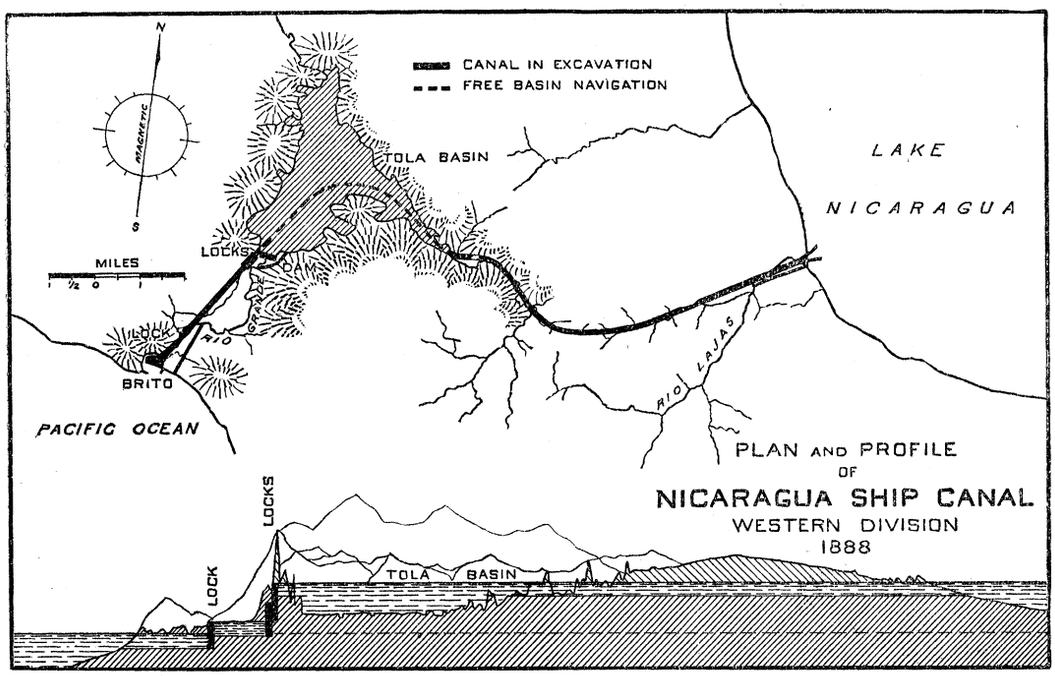
The work accomplished is highly creditable to the Construction Company. No expense or personal efforts have been spared to bring out the whole truth; and the detailed drawings representing the entire route, the geological specimens, the results of many borings of the ground, and much other valuable information bearing on the subject, now in possession of the company, bear testimony to the sound and honest intention of the promoters of this great enterprise not to go before the public until they are fully prepared to answer all questions, and to show with unusual accuracy the probable cost of the entire work.

The recent surveys extended over the whole ground; and after discarding those routes, or portions of routes, possessing the least merit, the whole force of the expedition was concentrated on those two presenting the greatest facilities for the construction of the canal. The difference between these two routes was confined to that portion extending from Greytown to the dam at Ochoa, there being no difference of opinion as to the best location between this latter point and the Pacific. Two routes had been suggested from Ochoa to Greytown, — one, the result of the survey of 1885, and called the 'upper route' on account of its striking feature of extending the summit or lake level across the basin of the river San Francisco and the 'eastern divide' to within a short distance of Greytown; the other, or 'lower route,' the result of the survey of 1872–73, extending through the lower valleys, and in close proximity to the river San Juan, to the divergency of the stream San Juanillo, an outlet of the San Juan River, and thence by a direct line to Greytown. Both routes have been re-examined and located with the same care, and with that precision which seems to control the work of the company; and a careful comparison of the results obtained shows the superiority of the upper route.

As now finally adopted, the location does not differ in general direction, controlling features, or total length, from that of 1885; but the last, more minute surveys have established beyond a doubt



the practicability of important improvements, which were only suggested as possibilities after the previous, more preliminary survey, and which will materially contribute to reduce the cost of the work by increasing the length of free navigation through basins, and proportionally increasing the capacity of the canal with a marked reduction of the working-expenses.



The route extends from Greytown, on the Atlantic, to Brito, on the Pacific, a distance of 169.67 miles, divided as follows: —

	Free Navigation.	Canal in Excavation.
From Greytown to the Deseado basin	–	12.37
Deseado basin	4.00	–
From Deseado basin to San Francisco basin	–	3.07
San Francisco and Machado basins	11.00	1.73
River San Juan	64.00	–
Lake Nicaragua	56.50	–
From Lake Nicaragua to Tola basin	–	8.22
Tola basin	5.28	–
From Tola basin to Brito	–	3.50
Total miles	140.78	28.89

The Deseado and Tola basins are new features brought out by the last location, as well as an increase of 2.13 miles in the length of free navigation in the San Francisco and Machado basins: in other words, the last location has reduced the length of canal in excavation from 40.3 to 28.89 miles, or 11.41 miles, and has increased the free navigation by that same distance; while the summit level has been extended from 144.8 miles to 153.8 miles.

It will require some time to complete the estimates of cost on the new location; but it may be safely stated that at least ten per cent will be gained in the total cost based on the survey of 1885, which is $64,036,197, including twenty-five per cent for contingencies.

THE BROOKLYN INSTITUTE.

RATHER more than fifty years ago a library association was formed in the city of Brooklyn, which grew in scope and usefulness, until in 1843 its charter was amended, and the name changed to that of the Brooklyn Institute. Courses of lectures were delivered from time to time, including in the list of speakers such men as Agassiz, Dana, Gray, Henry, Torrey, Guyot, and Cooke. Several important bequests made the institute financially strong, and its public hall was a favorite place of social gathering, aside from its main purpose of public instruction.

As time advanced and Brooklyn grew in size, the Academy of Music and other public buildings were erected, and the institute building waned in popularity. In 1867 the directors found it advisable to remodel the interior at an expense of thirty thousand dollars, which necessitated a mortgage on the building. Since that time, until quite recently, the entire income from its endowment fund has been absorbed in payment of the interest and principal of this debt. Final payment on the mortgage was made early in 1887.

The property now consists of the institute building and land, near the entrance to the great bridge, a library of fifteen thousand volumes, and endowment funds to the value of forty-six thousand dollars. The income from this is now applied to the purpose for which it was originally intended, and about a year ago the institute began upon a new era of activity.

One part of the endowment fund, bequeathed in 1851 by Augustus Graham, is devoted to the support of a limited course of Sunday-evening lectures on 'The Power, Wisdom, and Goodness of God as manifested in his Works.' In accordance with this requirement, lectures were delivered last winter by Sir J. William Dawson of Montreal, and by Dr. Alexander Winchell of the University of Michigan. Another part of the Graham fund is for the support of lectures on scientific subjects on other evenings of the week, and without specific restriction of topic. An introductory course of six lectures on astronomy was given last autumn by Prof. C. A. Young of Princeton. This was followed during the winter by another course, including topics in physics, geology, astronomy, and architecture. The lecturers were Messrs. George W. Plympton, W. LeConte Stevens, William C. Peckham, Franklin W. Hooper, and Garrett P. Serviss, of Brooklyn, and Dr. J. S. Newberry of New York.

Meanwhile steps had been taken with a view to the organization of a scientific society, with the Brooklyn Institute as its home. A meeting for this purpose was held in February, 1888, resulting in the adoption of by-laws and the formation of a council. Of this, Dr. Charles E. West was elected president, and W. LeConte Stevens secretary. Soon afterward the Brooklyn Microscopical Society and the American Astronomical Society became merged in the Brooklyn Institute as special departments of that body. The by-laws provide for departments in every branch of science, including anthropology, architecture, astronomy, botany, chemistry, en-