

present anomalous condition of the silver coinage, but even to take any rational measures for finding out what ought to be done in the case, is another subject on which their views would be of interest. I cannot help thinking, if they would grapple with these practical difficulties, and tell us what wise and good legislation they expect to get through congress, they would be more effective than they are in confining themselves to discussions on which no effective issue can be joined.

S. NEWCOMB.

FLOODING THE SAHARA.

MUCH misinformation has of late been spread abroad respecting 'the proposed interior sea of Africa,' and the public has been misled by inaccurate statements in regard to the magnitude of the enterprise, which, it is assumed, the French people are about to undertake. For these current erroneous impressions the English and American scientific journals are largely to blame. An old theory regarding the Sahara — that it was for the most part below the level of the ocean — has been adopted as though modern surveys had not refuted it; and so the conversion of a material portion of the African continent into a navigable sea is being popularly considered as not only possible, but altogether likely to be accomplished.

A brief consideration of the published results of the recent surveys will be sufficient to convince the reader that the popular estimate of the magnitude of this enterprise is absurdly out of proportion to the greatest possible accomplishment.

This overestimate is not surprising when we consider the character of the references to the scheme which have been made by journals of the best standing. The following paragraph from the foremost among engineering journals may be taken as a sample: —

"With reference to the daring French project for flooding the desert of Sahara with what would be virtually a new sea, it may be well to recall the opinion expressed by M. Elisée Réclus, that at one period in the world's history the desert was covered by a sea very similar to the Mediterranean, and that this sea exercised a very great influence upon the temperature of France, as comparatively cold — or, at any rate, cool — winds blew over it, while now the winds which prevail in the great expanse are of a much higher temperature, and are, in fact, sometimes suffocatingly hot. The appearance of the desert seems to support the theory of M. Elisée Réclus, that it was at one time the bed of a sea of considerable extent, of which the great inland African lakes recently discovered are possibly the remains. The present

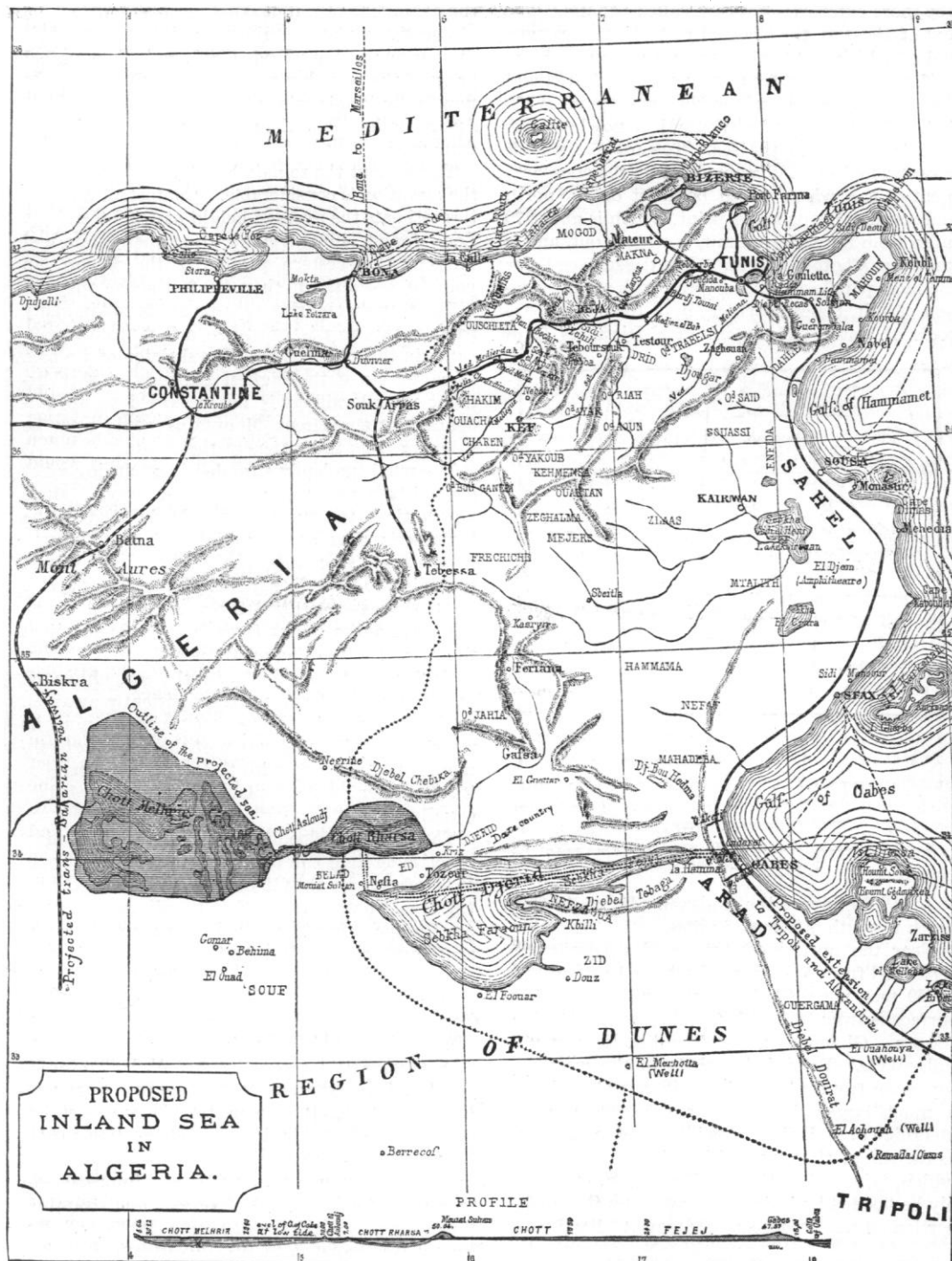
vast extent and configuration of the African continent would also appear to support the conclusion that at one time it comprised a less area of land than it does at present. The serious question which arises, assuming that the theory of M. Elisée Réclus is substantially correct, is, What will be the effect of the creation of a second African sea in the room of that which has disappeared? Would the temperature of France, and possibly even of England, be again reduced? It is a geological theory that in the glacial period of the world's history Great Britain was covered with ice and snow very much as Greenland is at present. Some great influences must clearly have been brought to bear upon France and Great Britain, which rolled the ice over so many hundred miles northward. What was this influence? Was it the large African sea which French enterprise is endeavoring to recreate? If it were, we should say that whatever the French may gain in Africa by the realization of a Saharan Sea would be much more than counterbalanced by what they would lose in France itself."

A writer in another journal suggests that all nations interested in the commerce of the Mediterranean may by right protest against the execution of a scheme that would produce a troublesome current through the Straits of Gibraltar. And the same writer, furthermore, adds, "So much water drawn from the present oceans, may, by lessening the depths of the harbors of the world, produce serious and wide-spread inconvenience."

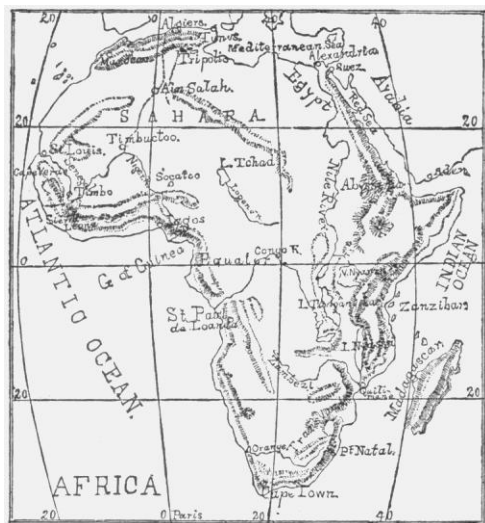
That all such fears are utterly groundless is abundantly shown by the results of the careful surveys made within the last few years. A brief *résumé* of these results is presented below. The figures are reduced from the metric measures in 'Nouvelle géographie universelle,' by Réclus, and the maps from 'Le génie civil.' In both cases the authority quoted is the French engineer, M. Rou-daire.

Every one who, as a student, has had to draw the map of Africa, can certainly recall that singular interruption to the otherwise regular coast-line on the extreme northern boundary, where the coast, for a comparatively short distance, has a general north and south trend. This notch marks the north-eastern terminus of the Atlas mountain system. The eastern shore is the eastern boundary of Tunis; and on it, in ancient times, stood Carthage. An indentation at the southern part is called the Gulf of Gabès.

A line extending due west from the shore of this gulf crosses a barren region, of no interest but for the project about which this article is written. It is a region abounding in basin-shaped depressions, containing either shallow salt-marshes,



brackish pools, or deposits of salt and gypsum. The more extensive areas are called 'chotts.' The first of these is the Chott-el-Fedjedj, the eastern end of which is 12 miles from the shore of the gulf, and separated from it by a ridge of drift and limestone whose altitude at the lowest point is 150 feet. The surface of el-Fedjedj is nowhere less than 48 feet above the sea. Toward the west it is contracted in width somewhat by the encroachment of the ridges which bound it on the north and south. Beyond this point, which is about 70 miles from its eastern limit, it widens out, and is known as Chott-el-Djerid. Here the surface is for the most part level, and covered with an incrustation of salt, beneath which, in a few places, are pools of water. The plain of el-Djerid is from



MAP OF AFRICA, SHOWING THE RELATIVE SIZE OF THE PROPOSED INLAND SEAS.

50 to 200 feet above the sea-level. Its width from north to south is about 45 miles.

Near the north-west border of el-Djerid, and separated from it by a ridge whose least altitude is 550 feet, is the Chott Gharsa or Rharsa, whose surface is from 30 to 35 feet below the level of the sea. Gharsa is about 50 miles long and 20 miles wide. Beyond this chott to the west, and separated from it by an insignificant elevation, is a much larger depressed area, known as Chott Melghigh or Melhrie. This is the basin referred to as the site of the proposed interior sea. The area which, lying below the Mediterranean, can possibly be flooded by it, is represented by the shaded portion on the accompanying maps.¹ Portions of

¹ The scale of the larger map is about 58 miles to the inch.

this area are 100 feet below the sea-level; and the average depth, if flooded, would be 78 feet.

The figures above given exhibit the possible dimensions of the 'flooded Sahara.' The united areas of the two chotts over which the sea would flow is, by Roudaire's measurements, about 3,100 square miles, less than half the area of Lake Ontario.

Throughout the remainder of the Great Desert the elevation is considerable. Competent authorities estimate the average height at 1,100 feet. Dr. Lenz found, in travelling over many hundred miles of the western portion of the Sahara, no point of less altitude than 470 feet above the sea.

The fact that marine deposits are found in many parts of this area is, of course, a fact of no significance in this connection. The skeleton of a whale found in one of the highest cuttings of the Vermont central railway is not regarded as an evidence that the Green Mountains could now be submerged by the waters of the ocean.

The whale probably stranded there during what geologists term the 'Champlain epoch,' since which time the surface has slowly risen. The hypothesis that at least eighty thousand years have elapsed since this epoch is believed by most geologists to be well founded. Explorations across the African desert justify the belief that the marine deposits found there are not less ancient than those of the Champlain period.

To flood such a section with the sea, either the next great subsidence must be patiently awaited, or else an extensive system of pumping must be resorted to. The realization of the scheme of submergence (to accord with the popular estimate of it), by either of these plans, may be regarded as equally remote.

The project of flooding the Sahara to the utmost practicable limit can hardly be called a great one. It is safe to say, that if executed, which is doubtful, it will not sensibly affect the climate of southern Europe. It will not create dangerous currents at Gibraltar, nor inconvenience seaports in any part of the world.

GEO. W. PLYMPTON.

LONDON LETTER.

A SUGGESTIVE report by Mr. W. H. Power, of the Local government board, has just been published, relative to the connection between scarlet fever and infected milk, — a connection which has long been suspected. The farm in question was sanitarily perfect, every modern improvement in respect to cleanliness of vessels, and examination of persons employed, being in force. Mr. Power was assisted in his investigation by Dr. Klein; and their joint results leave little or no