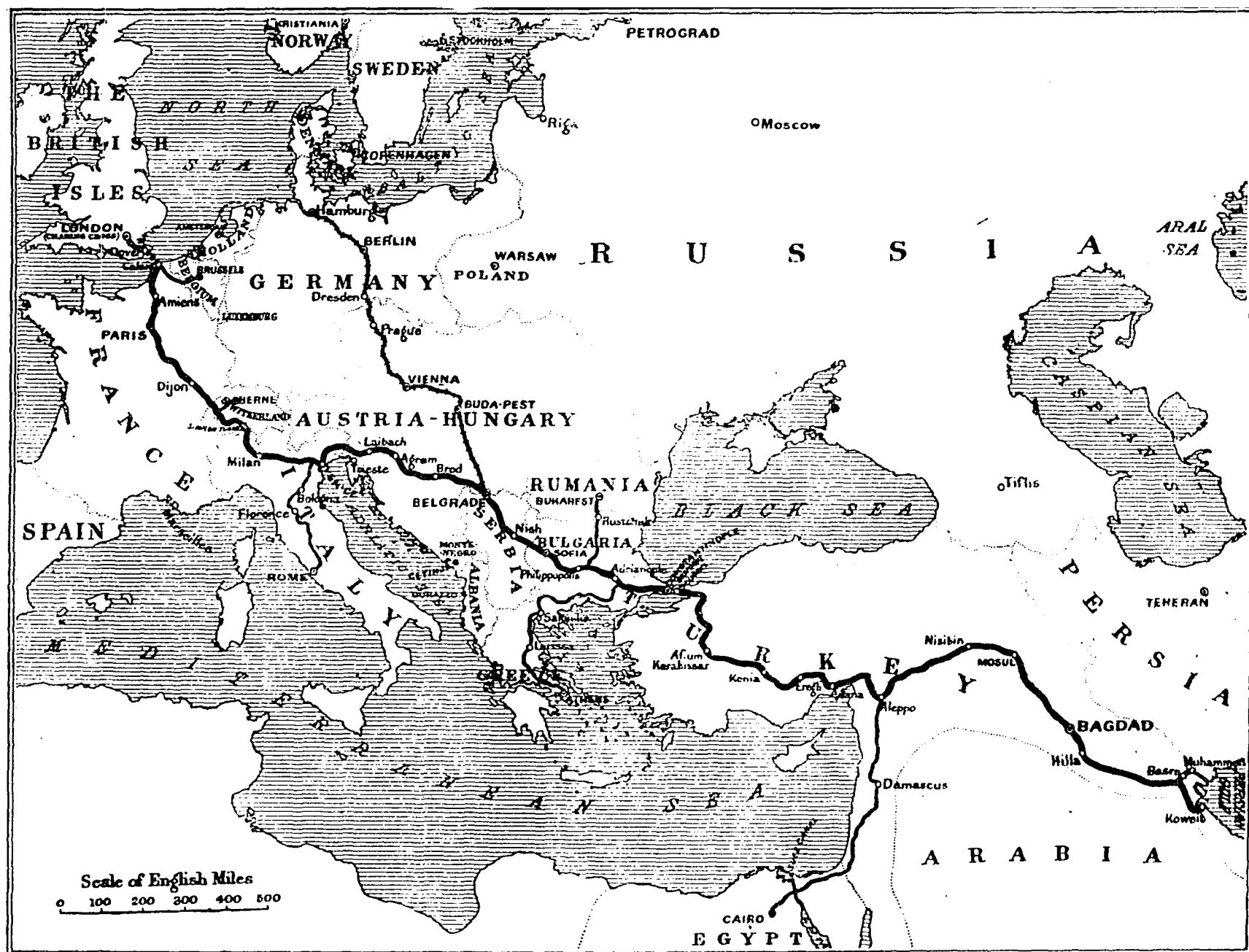


Channel Tunnel After a Hundred Years of Talk

Plans for Railway Tubes Between England and France Are Maturing Now That the Two Countries Have Reached a Decision



From London to Bagdad—The Inter-Continental Railway Which Will Be Made Possible After the Building of the Tunnel Under the British Channel.

ONE of the great engineering dreams of the world has been brought much nearer to practical realization by the conversations which, as Bonar Law recently announced in the House of Commons, have been opened between the British and French Governments on the subject of a Channel tunnel.

Geographically a tunnel under the Strait of Dover will be unimportant by comparison with the Panama and Suez Canals; commercially no great new avenues in the relations of whole continents will be opened up; and even politically the results will hardly be commensurate with either the hopes or the alarms which friends and foes of the scheme have in past years expressed on the subject. Nevertheless, the boring of a Channel tunnel will still mark a new and important stage of world progress; and from an engineering point of view it will of course rank high among the feats accomplished by human skill and labor.

As in the case of many other schemes which appeal to the imagination, the conception of a Channel tunnel is French. It was suggested to the First Napoleon by a French engineer named Mathieu, and shortly after the Peace of Amiens the Emperor proposed it to the then British Ambassador in Paris, saying: "This is one of the great things we should do together." The Ambassador's reply is not on record; but it has taken England more than a hundred years to look upon the proposal with favor. And even yet it is not altogether certain that British public opinion is quite satisfied that the "Charing Cross to Bagdad"

of the advocates of the tunnel is so alluring a phrase as the "splendid isolation" which so long stood the opponents of the scheme in good stead. So far only the former have been heard from, and they have what is called in America a strong lobby. They have also a good press, but here and there are indications that considerable opposition may develop on various grounds.

Perhaps foremost among these is the remarkable fashion in which the tunnel scheme has come to the front. Horatio Bottomley, whose extraordinary activities since he was elected to the present Parliament are recognized by friend and foe alike, put a question to the House to which Bonar Law gave the offhand reply that he was in communication with the Prime Minister on the subject of approaching the French Government with a view to beginning immediately the construction of the tunnel in order to find work for discharged soldiers. This apparently casual announcement of a policy which reversed all previous Parliamentary decisions, took the House by surprise, although it would seem that it was not unexpected by a relatively small number of members who for some years past have stoutly waved the tunnel banner. Some criticisms of the Government announcement were also made on the ground that the decision was not based so much upon the essential merits of the tunnel plan as upon its expediency as a method of providing work for demobilized soldiers.

"Another side show," was how one critic described the matter, adding: "Presumably, when Lloyd George has five minutes to spare he will decide the question, and if he thinks proper to be-

gin the tunnel, begun it will be. Parliament may be permitted to discuss the subject, and will be required to vote the money, but the decision will have been made already. The ostensible reason is to provide employment for discharged soldiers. This is surely an extraordinary argument. According to the available evidence, men are wanted in every trade and industry; we are perpetually told that the most urgent need is production, and we believe it; and now we learn that thousands of men are to be set to dig their way to France because there is nothing else they can do."

It is perhaps necessary to remark that these objections are raised in The Morning Post, which is an unflinching critic of the Government; but it is also worth noting that The London Times is by no means wholehearted or enthusiastic in its support of the scheme. A great majority of the newspapers, however, is arrayed on the side of The Daily Chronicle, which for years before the war was the most active and persistent advocate of the tunnel in the British press. Opposition to it in those days was chiefly of two kinds, partly insular prejudice and partly a survival of the military objections which were formulated nearly two generations earlier by Lord Wolseley and others on the basis of conditions which had since become obsolete. During the war opinion in favor of the tunnel grew under the stimulating influence of arguments that had it existed in 1911 the British Expeditionary Force could have reached the front many precious days earlier; had it existed between then and 1919 the whole problem of supporting, supplying, and reinforcing Britain's western armies would have been irre-

culably lightened, and the German submarine campaign would have lost a serious part of its sting.

Even now, however, it is rather pertinently pointed out that, had the Channel tunnel been in existence in 1914, German military strategy would undoubtedly have been different, and instead of making Paris their first objective the Kaiser's armies would have been directed to securing the territory in which the Channel tunnel had its French exit. If the argument is pursued, it will become evident that a rather good case can be made out against the tunnel on the very same premises as those upon which a case is made out for it.

Generally speaking, however, it is taken as an accepted fact that opposition to the tunnel is no longer serious on military or naval grounds, and that, as the French Government has always been sympathetic to the scheme, it only remains for the British Government to press the button for work to begin without delay. According to some enthusiasts, not even Parliamentary sanction is required, the Government having sufficient powers under D. O. R. A. that such execrated lady whose full name is Defense of the Realm Act.

The Government, however, is hardly likely to take such a step, rendered entirely unnecessary by the fact that it can command an overwhelming majority for practically any purpose.

To Sir Arthur Fell, M. P., for Yarmouth, credit is due, more perhaps than to any other man in England for such changes as have come about in the public attitude toward the tunnel. He is Chair-

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man of the House of Commons Tunnel Committee, but by ill-luck was not in the House when Mr. Law made his announcement. Sir Arthur states that the engineering plans are so far advanced that work could be begun at once. These plans have been drawn up by the engineers of the Southeastern & Chatham Railway, in conjunction with Government officials on this side, and by the Northern of France Railway and the French Government on the French side.

When the plan was first considered some years ago it was thought possible to start the tunnel on the British side comparatively near the coast in the neighborhood of Dover, but a big cliff fall between Folkestone and Dover since then has compelled the choice of a new starting point much further inland. It is thought inadvisable to give its exact location until the necessary land has been acquired. It lies to the northwest of Dover, and a new branch railway line, probably from Ashford, will have to be built to bring the trains to the mouth.

A site for the other entrance on the French side has also been secured some way from the coast, which there, as on the English shore, consists of cliffs, and additional French railway construction will also be necessary.

The total length of the tunnel, including the approaches on both sides of the strait, will be thirty-two miles, of which rather more than twenty-one and a half miles will be under the sea. The first work was done on the tunnel in 1874, when a French company sunk an experimental shaft in France. In 1881 the Southeastern Railway Company's Chairman, Sir E. Watkin, obtained an act permitting him to sink a shaft on the English side. A boring was driven for

2,015 yards toward the Channel, when in 1882 the construction was stopped by the Government. Since then the scheme has been in abeyance, but in 1913 the Government called for reports from naval and military authorities with a view to permitting the construction if they were favorable. Then the war came and nothing more could be done.

Present plans provide for the building of two tunnels, each 18 feet in diameter, connected by cross galleries at intervals of 200 yards. The lines would be worked by electricity, as in the case of the Simplon Tunnel, which is twelve and a half miles long, and is at present the longest.

The maximum depth of water on the route is 180 feet, and a cover of chalk 100 feet thick would be left undisturbed above the crown of the tunnel to provide against any danger from an enemy or the sea, so that the tunnel would descend to a level of about 280 feet below the sea's surface.

Iron tubes will be built up as the tunnel advances, precisely as in the London "tubes." Owing to the extraordinary advance in the art of tunneling in recent years the work could be done quickly, and it is estimated that the tunnel itself could be completed in five or five and a half years.

Sir Francis Fox is mentioned as the engineer who may have charge of the work on the British section of the tunnel. He is a great tunneling expert, and acted as special adviser for the Swiss Government in the boring of the Simplon.

Trains will be run direct from London to Paris in less than six hours, and these could, if required, travel at a "headway" or interval of not more than five to ten minutes. Doubtless in course of time more than two pairs of rails will be required to deal with the enormous

volume of traffic which must inevitably develop in each direction. So soon as trains can pass under the Channel they will be able to traverse France, Belgium, Holland, Spain, Italy, Germany, Austria-Hungary, and Turkey as far as Constantinople without any difficulty as to gauge or minimum structures.

The Orient Express connection formerly left London at 9 A. M., an inconvenient hour for many; but so soon as the Channel Tunnel is an accomplished fact it could be arranged to leave at noon and still depart from Paris at the usual hour. It would pass through Germany and Austria-Hungary to Bucharest, or through Bulgaria to Constantinople. A quarter of an hour later a train would leave Charing Cross as the Nord express for Brussels, Berlin, and Königsberg to Petrograd, and for Warsaw, Minsk, and Moscow, where it would correspond with the Siberian Railway express to the Far East and provide communication also with the watering places in the Southern Crimea. At further intervals of a quarter of an hour the Rome express would leave for Paris—the Riviera, Rome, via Turin and Milan, and Brindisi, followed by the Sud express to Paris, Bordeaux, Madrid, Algeria on the one hand, or to Lisbon on the other. Communication would be provided not only with Belgium, Holland, and Denmark, but also with Finland, Sweden, and Norway via Tornea.

Before the war it was estimated that the tunnel would cost £16,000,000. Increased price of labor, plant, and so forth would now probably carry the cost to £20,000,000—some estimates say £25,000,000.

Sir Ernest Moir of S. Pearson & Son, Ltd., who built New York's East River tunnels which connect Manhattan with Long Island, said in an interview: "In

building the East River tunnels it was necessary to bore through hard rock covered with immense glacial boulders overlaid with quicksand. In the case of the Blackwell tunnel, the bore was run close under the gravel bed of the river, and a blanket of London clay, which is impervious to water, was laid between the gravel and the tunnel. I have, through small inspection apertures in the tunnel, seen the gravel swayed to and fro by the river.

"In the Channel the sea is not the difficulty; the risk lies in the geological aspect. The first layer under the Channel is white chalk, and beneath this is a belt of gray chalk some 300 feet in depth. The question arises whether or not this gray chalk is impervious to water, for through it engineers consider the tunnel will have to be bored. If it is impervious the tunneling will be easy compared with the East River tunnels."

Little information is so far forthcoming with regard to the financial aspects of the undertaking. A French company was formed in 1875, and, though somewhat modified since its foundation, still remains in existence, with a concession from the French Government which holds good for ninety-nine years after the opening of the tunnel. In the same year a British company was formed and obtained Parliamentary powers to undertake experimental work, but, as Baron d'Erlanger, its President, who succeeded his father in that position in 1911, has pointed out, the British company has no such concession from the Government. Baron d'Erlanger, however, says he has every reason to hope that his company will be permitted to carry out the actual work under control of the Government. The British company has expended about a million dollars in preparatory work.