

TURKEY. No. 4 (1896).



# REPORT

BY

## MAJOR LAW

ON

### RAILWAYS IN ASIATIC TURKEY.

[WITH FIVE MAPS.]

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*Presented to both Houses of Parliament by Command of Her Majesty.  
May 1896.*

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## Report by Major Law on Railways in Asiatic Turkey.

[WITH FIVE MAPS.]

*Major Law to Sir P. Currie.*

Sir,

London, October 20, 1895.

I HAVE the honour to inclose herewith a Report on railways in Asiatic Turkey. In compliance with your Excellency's instructions, I went over the route of the proposed Haifa-Damascus-Hauran Railway, and that of the recently completed Beyrout-Damascus-Hauran Railway. I then proceeded to Mersina, and went over the Mersina-Adana Railway. I next visited Smyrna, and inquired into the conditions of working of the two railways leading into the interior from that port, and I rode over the country between their present termini and the Eski-Shehr-Koniah branch of the Anatolian Railway; finally, I took the rail from Eski-Shehr to Angora, and returning by the Anatolian Railway to Biledjik, I rode from that station to Broussa, where I had the opportunity of seeing and travelling on the Moudania-Broussa Railway. I had already on a previous occasion ridden from Broussa via Levke and the valley of the Sakharria to Ismid, and travelled by rail from Ismid to Haidar-Pasha. I have now been over all the existing railways in Asiatic Turkey, with the exception of the short line between Jaffa and Jerusalem.

It will be noted that at the outset railway enterprise in Asia Minor was entirely in English hands. The Mersina-Adana, the Smyrna-Aidin, the Smyrna-Cassaba, and the Haida-Pasha-Ismid were all built with English capital and English material, and under English management. To-day the Smyrna-Aidin remains the only English concern, and there has been no English participation in the great enterprises of the Anatolian Railway, or the reconstruction and extension of the Smyrna-Cassaba. This circumstance is unfortunate as regards the general interests of British trade, for not only has the supply of large quantities of railway material passed into other than British hands, but the diminution in the number of Englishmen employed on the railways is also a distinct and serious loss, as every Englishman in a foreign land involuntarily acts as an agent for the introduction and manufacture of English goods.

It is not very easy to account for the sudden disappearance of British interest in railway enterprise in Turkey, but there are, I think, two main causes which have led to this result. In the first place, the railways originally undertaken by Englishmen were built in the hope and belief that an immediate and paying traffic would be secured, and though, as in the case of the Smyrna-Aidin, bold plans were formed for the future, the general idea was rather to push forward gradually, and only as the necessity and profit of extension became clearly apparent. Little or no assistance was sought from the Government, and hopes of profit depended on the successful development of traffic on the railways, and not on financial operations connected with introducing them to the investing public. Recent railway enterprises in Turkey would appear to have been undertaken on somewhat different lines. Government guarantees of revenue have been liberally granted, provided the lines to be constructed followed the routes which the Government desired, and the question of traffic development thus losing its primary importance, more attention appears to have been devoted to seeking an immediate profit in the financial operations connected with transferring the Concessions to Syndicates of capitalists, and the forming of Companies for the construction and working of the railways. The economical interests of the country would probably in the long run have been best secured under the old English method of proceeding, but under that system it would have been found impossible to arrive at that rapid extension of railways which has



been witnessed in the last few years, and which the Government apparently considered it necessary to encourage, even at considerable present and future cost.

The other circumstance which has, I think, contributed to exclude English enterprise from recent railway undertakings is the difference in the system of working of English and foreign banks. The new railways in Turkey have been financed by French and German banks, and whilst the constant endeavour of English bankers is to confine their attention to what is in English styled "legitimate banking business," and to keep their assets liquid, the foreign establishments are prepared to face the risks of considerable locking-up of capital, and will also freely undertake a class of promoting business which is generally looked upon askance by English bankers. There can be no desire to see a less cautious system in England, but it is evident that, under existing circumstances, greater facilities are to be found abroad, for carrying out certain classes of business. Possibly the difficulty might be met by forming powerful Syndicates for the express purpose of providing the capital required for the initial proceedings of obtaining railway Concessions, making surveys, and even in some cases constructing and temporarily working short sections of railway, so that the subscriptions of the investing public need not be invited until the ground was clear, and the precise nature and prospects of the enterprise could be clearly set forth.

Although there is no immediate prospect of the construction of the Euphrates Valley railroad, the practical certainty that such a road will sooner or later be built, and the great importance which has been attached to the project in England, render it, I think, advisable to consider this question with greater attention than it is necessary to devote to other schemes for future railway construction. The calculations I have made show that, if Haifa be taken as the starting point for a route from the Mediterranean to Bombay via the Shatt-el-Arab, this overland route will be some 200 miles shorter than the sea route through the Suez Canal, but that, against the extra 1,287 miles of steaming involved by the Suez route, must be set off 1,060 miles of railway travelling across Turkish territory, besides the expense and delays of the two transshipments, at Haifa and at Bussorah. In view of these facts I think it most doubtful if forty-eight hours could be saved by taking this route to Bombay, and I cannot believe that such a comparatively small saving of time would be found an adequate compensation for the trouble and expense involved in two transshipments. The Euphrates Valley and Persian Gulf route will be the inevitable mail route to India, when there is direct rail communication between Bussorah and Western Europe via Constantinople. Until such direct communication is established, the dream of a route to India through Turkey, even for mails, may, I think, be abandoned.

Beyond the completion of railroads already commenced, I do not anticipate any important early extension of the railway system in Asiatic Turkey. Without Government guarantees it will be difficult to present new enterprises in a sufficiently attractive form to secure the attention of investors, and the heavy liabilities of the Treasury on account of the guarantees already given, are likely to prevent the extension of this system with new Concessions. In this connection, I have in the inclosed Report pointed out the unfortunate influence of the conditions under which railway guarantees have hitherto been granted, and how the burden on the Treasury has been increased by the general fall in the prices of agricultural produce. Turkey is essentially an agricultural country, and the fall in prices, which has been most prejudicial to the prosperity of the peasant population, has naturally also had an injurious effect on railway traffic returns.

I have, &c.  
(Signed) E. FG. LAW..

Inclosure.

*Haifa-Damascus-Hauran and Beyrout-Damascus-Hauran Railways.*

THE Concession for the construction of a railway from Haifa to Damascus, with a branch to Bosrah, in the east of the Hauran, was granted in 1890 to a M. Elias, a Syrian engineer, but by arrangements with this gentleman, the realization of the enterprise was undertaken by Mr. Pilling, a British subject. Financial difficulties have hitherto retarded the construction of this most important line, and up to the end of last September not more than 5 miles of permanent way had been completed, and there was no sign of any immediate resumption of activity, the necessary contractor's material not being on the spot. Meanwhile the term of the original Concession is expiring, and its

Concessionnaire.

Condition of works.

renewal to the same parties will certainly be strenuously opposed by those interested in the rival railway already working from Beyrout, viâ Damascus, to Mezerib in the Hauran, and proposed to be extended towards the Djebel-el-Druz.

The Haifa-Damascus Railway, with its authorized branches tapping the great grain-growing districts of the Hauran and the Djebel-el-Druz, appears to be one of the most important of existing or proposed railways in Asiatic Turkey. The project has hitherto attracted attention chiefly from the belief that the line is destined to become the terminal of the much talked-of Euphrates Valley Railway, which, connecting the Mediterranean with the Persian Gulf, must, it is assumed, become the great highway to India. Whatever may be the importance of a railway from Haifa to Damascus, it seems to me improbable that this line will ever form part of an important route to India. When steamers were slow, and steam-ship service had not attained its present development, the idea of curtailing the sea-voyage, between the Mediterranean and the north-west coast of India, was certainly most fascinating, and its practicability and utility had become articles of faith in England, through the tradition of a time, not long past, when Aleppo was a great emporium and centre for the distribution of valuable Indian products, which reached that town by the Persian Gulf and the Euphrates Valley, and were shipped for European consumption, from the neighbouring Mediterranean ports. Circumstances have, however, so changed all former conditions, that the old importance of the route from the Shatt-el-Arab to the Mediterranean, will not be restored by the construction of a railway. Haifa is 100 miles further than Suez, from Gibraltar and the western ports of the Mediterranean, and Bombay is 1,387 miles nearer to Bussorah than to Suez. This, as far as sea transit is concerned, means 1,287 miles, or, at 15 knots, say three and a-half days less steaming by Suez. But it must be borne in mind that, whereas the route by the Suez Canal avoids all transshipment, the route by rail across Turkey demands a first transshipment at the Turkish Mediterranean port, and a second at Bussorah, and further, that the distance from Haifa to Bussorah, via Damascus and Biredjik, being roughly 1,060 miles, the railway journey from port to port, at 25 miles an hour, would take nearly two days, whilst, should it be found advisable, there would be no difficulty in increasing to at least 18 knots, the speed of the steamers plying between Suez and Bombay, and such an increase of speed would save twelve hours by the Suez route.

When all existing conditions are fully considered, it seems clear that the Suez Canal must remain the proper route from central and western Europe for goods, troops, and all passengers who are not careless of money, and are not under pressing necessity to try and save one or two days on their journey to India. For mails, and for the few exceptional passengers to whom the saving of a few days is of real importance, the quickest route of the future will certainly be found viâ Constantinople, Cæsarea, Diarbekir, and Mosul, to the head of the Tigris Valley, or, from Constantinople by Cæsarea, and Marash, to Biredjik on the Euphrates, and following either the Tigris or the Euphrates, to Bussorah and the Persian Gulf. This route reducing the sea voyage to a minimum, would, when properly worked, certainly effect a considerable saving of time, but until a good through service is organized in connection with the continental mail-trains, the increasing speed of steam-ships will continue to maintain the advantage of the Suez Canal route.

I now turn to the consideration of the circumstances and conditions which, apart from any question of through traffic, will, I believe, render the Haifa-Damascus-Hauran Railway a profitable undertaking, provided that expenditure in construction is properly controlled, and that the amount paid for preliminary expenses, including those connected with obtaining or renewing the Concession, is kept within reasonable limits. It is very necessary in predicting a prosperous future for the enterprise, to make such reservations, and particularly as to the amount of preliminary expenses, since there is, unfortunately, too often a tendency to permanently cripple what should be sound undertakings, by overloading them with unnecessary and unjustifiable charges at the outset.

Map No. 1 shows the proposed railway and surrounding country, the details having been kindly sketched for me by Dr. Schumacher, a highly capable resident engineer, well-known in connection with his valuable services to the Palestine Exploration Society. The map shows by a red line the proposed route of the Haifa-Damascus line, and by a yellow line the route of the recently completed Beyrout-Damascus-Hauran line. It is impossible to make a serious study of one of these railways, without at the same time considering the circumstances and prospects of the other, since their mutual rivalry is a most important feature in the general situation. It will be observed that the distance from the port of Beyrout to Damascus is considerably shorter than the distance from Haifa to Damascus. The former is only 90 miles, whilst the latter is approximately 155 miles. On the other hand the distance from Beyrout to Mezerib, in

Euphrates Valley scheme.

Comparison of routes to India.

Comparison of railways from Beyrout and Haifa.

the Hauran, is some 140 miles, whilst the distance from Haifa, viâ Nawa, to the same point, is not more than 100 miles, and the grain-growing districts of the Hauran, on which both lines must depend for their most important traffic, are situated to the east of Mezerib. But the most important advantage of the Haifa Railway is that the entire route passes through exceptionally fertile districts, and further, that whilst the Beyrout line has to traverse the two elevated mountain ranges of the Lebanon and the Anti-Lebanon, the Haifa Railway presents no engineering difficulties except in a section of some 20 miles, where it rises from the Lake of Tiberias, 812 feet below sea level, to the elevated plain of the Jaulan, near Fik, 1,046 feet above sea level, and exclusive of this section, and of three comparatively unimportant bridges, over the Rivers Kishon, Jordan, and Yarmuk, it can be built at a very small cost per mile.

The Beyrout-Damascus-Hauran Railway is throughout a narrow-gauge line, 1 metre wide, and the difficulties of crossing the Lebanon and Anti-Lebanon ranges are such that to ascend the severe gradients which could not be avoided, it has been necessary for the greater portion of the distance between Beyrout and Damascus, to adopt the "Abt" system, with a third or "rack" rail. The altitudes attained by the railway on the Lebanon and Anti-Lebanon are given, respectively as 4,895 feet and 4,370 feet, there is an abrupt and heavy fall from the Lebanon into the valley between the two ranges, and another descent to Damascus, which is approximately 2,240 feet above sea level. The goods waggons are calculated to carry 8 tons, and it is stated that a train of 87 tons was experimentally hauled up the steepest gradient (about 1 in 17) at a speed of 12 kilom. per hour. The construction of the line was undertaken by the Société de Batignolles de Paris, and would appear to have been thoroughly well carried out. The combined rolling stock of the Damascus and Mezerib railways consists of 20 locomotives, 36 passenger carriages and vans, and 153 goods waggons and trucks.

The narrow-gauge line labours under the disadvantage that the Beyrout harbour so fails to satisfy requirements, that steamers of any size invariably lie outside, and consequently, in addition to extraordinarily heavy port dues, goods have to bear the great cost of transshipment into barges, for discharging or loading. Haifa is by far the best natural port for large ships on the Syrian coast; it can be improved at comparatively small cost, so as to afford perfect shelter at all seasons, and if this work is undertaken without the intervention of concessionnaires of the class who have destroyed the prospects of so many sound enterprises in Turkey, Haifa must surely become the most important commercial port south of Smyrna. I may add, as regards proposals for extending the Beyrout-Damascus line northwards that it would seem impossible for a tortuous narrow-gauge line, passing over great altitudes, to serve as a satisfactory terminal to an important trunk line.

As regards the general traffic which may be obtained by the competing Beyrout and Haifa Railways, I may quote, with some observations, the figures published in the prospectus inviting subscriptions of capital for the Beyrout-Damascus line, and a prospective estimate which has been given to me, of the traffic to be secured for the Haifa line.

According to the prospectus of the Beyrout-Damascus Railway, the annual exportation of Hauran produce by the ports of Haifa and Acre, is estimated at 71,000 tons, and it is assumed that this traffic will in future pass over the new railway for shipment from Beyrout. It is also assumed that this line will in future carry the 32,000 tons of general merchandize, which has hitherto been annually carried by the old Road Transport Company between Beyrout and Damascus, and, further, it is estimated that the Damascus-Mezerib section of the line will annually carry to Damascus 23,000 tons of Hauran produce for consumption in that city. The rates of carriage on all sections of the line are calculated at 20 centimes per ton and kilometre, which gives 43 fr. per ton from the Hauran to Beyrout, 27 fr. per ton between Damascus and Beyrout, and 16 fr. per ton between the Hauran and Damascus. The gross receipts for goods traffic should, according to this calculation, amount to approximately 4,300,000 fr., or about 170,000*l.* There is no estimate of passenger traffic in the last prospectus, and though between the Hauran and Damascus this is not likely to prove important, it will probably be fairly considerable on the section between Damascus and Beyrout. The working expenses are estimated at 6,000 fr. per kilometre, which is less than 32 per cent. of the estimated gross revenue without passenger traffic. The share capital of the Railway Company is 10,000,000 fr., and there has been an issue of 3 per cent. bonds for 60,000,000 fr. at a price of 59. Of this capital, 5,000,000 fr. were lent to the Beyrout Port Company to make certain improvements in their works, but the conditions under which this loan is granted are not fully set forth in the prospectus, though it would appear that the Railway Company is to absorb the Port Company as well as the old Road Transport Company. The net annual profit of the railway is estimated at 2,935,000 fr.

Description of  
Beyrout-Damascus  
Railway.

Shipping facilities  
from Beyrout and  
Haifa.

Disadvantages of  
narrow-gauge line  
as terminal.

Beyrout-Damascus  
Railway prospectus.

Estimated traffic.

Capital of the  
Company.

Realization of estimates.

It is, of course, difficult to say how far the estimates of the prospectus I have quoted will be realized, but it must be observed that 32 per cent. for working expenses is a remarkably low rate, particularly when it is remembered that by far the longer and more important section of the railway crosses two mountain ranges, where the old carriage road has often been blocked by snow, even in the month of March, and that the gradients require a quite unusual amount of locomotive power. Other points for consideration are that, although the tariff of 20 centimes per ton and kilometre has been sanctioned by the Government, it would seem very possible that such a high rate may prove prohibitive for the carriage of Hauran produce, and I have been informed on good authority that it has already been found necessary to accept 20 fr. per ton for the carriage of Hauran grain to Beyrout, whereas the rate of 20 centimes per ton and kilometre (on which the calculations of the prospectus are based) would amount to 43 fr. per ton for this distance. Further, although it is possible that the annual exportation of Hauran produce may increase to 70,000 tons and upwards, it would seem that the 50,000 tons which is assumed as the amount of this traffic in the estimate for the Haifa Railway, is a safer figure.

Damascus-Mezerib traffic returns.

The Damascus-Mezerib line has been open and working since July 1894, and the Beyrout-Damascus section has been opened quite recently. So far the results of working between Damascus and Mezerib have not been very satisfactory, although every economy is practised, and the tariff for both goods and passengers is very high.

The following are the figures which have been given to me:—

Goods traffic, from August 1, 1894, to July 1, 1895 .. .. .	14,100 tons.
General receipts, ditto, ditto .. .. .	14,450l.
Passengers carried, from August 1, 1894, to May 1, 1895 .. .. .	21,133.

Haifa Railway traffic estimates.

I may now give the figures which have been communicated to me as an estimate of traffic on the proposed Haifa-Hauran-Damascus Railway. I have endeavoured, as far as possible, to check these figures, and I think they are fairly reliable, but there are many points of uncertainty, and without more positively certain data on which to base calculations, I should not like to guarantee the results arrived at.

The average annual export of Hauran wheat from Haifa and Acre for the ten years, 1882-92, approximated 40,000 tons, and the average for other Hauran produce may be taken at 15,000 tons; 50,000 tons would, therefore, appear to be a reasonable estimate of the export of all kinds of Hauran produce. The annual exports of produce from the Jordan Valley has been estimated at 22,000 tons, but the data for this estimate are not clear, and 15,000 tons is probably a safer figure. The imports by the ports of Haifa and Acre have averaged 6,000 tons annually during the last four years, and this figure may probably be taken as a fair estimate. The consumption of Hauran produce in Damascus has been estimated as high as 30,000 tons annually, and in the prospectus of the rival Company it is calculated at 23,000 tons, so that 25,000 tons would appear a fairly safe estimate for this branch of traffic, including the return movement to the Hauran. In addition to the above, it would seem probable that a certain portion of the existing traffic between Beyrout and Damascus would be diverted to the Haifa line, provided special cheap rates of carriage were offered. This traffic now amounts to 32,000 tons annually, and the freight proposed by the Damascus-Beyrout Railway is 27 fr. per ton. There is no reason why the Haifa line should not carry goods from Damascus to the sea at a rate of 15 paras per ton per kilometre, equivalent to about 20 fr. per ton, and at this reduced rate it ought to be possible to secure some 10,000 tons of the traffic. Concerning passenger traffic, it is particularly difficult to obtain any reliable data, but 12,000l.—the estimated gross revenue from this source—would appear to be a fairly reasonable figure.

Calculating gross earnings on the above data, the following are the results obtained:—

	£
50,000 tons over average distance of 180 kilom., at 22 paras per ton-kilom. ..	41,250
15,000 " " " 90 " 27 " " " ..	7,600
6,000 " " " 120 " 30 " " " ..	4,500
25,000 " " " 130 " 22 " " " ..	14,895
10,000 " " " 250 " 20 " " " ..	10,400
Passengers (say) .. .. .	12,000
Total (say) .. .. .	90,000

Working expenses.

As regards working expenses, there appears to be no reason why a low rate should not be assumed. The line is of the ordinary broad gauge, and with the single exception of the short rise from the Jordan Valley, there are no gradients of any importance; there is no liability to obstruction from either snow or floods; there will be no necessity

for quick trains; and the price of fuel will not be high, as the steamers which come to fetch produce will naturally bring coal as ballast. Under more difficult circumstances, and with a much more complicated traffic, the working expenses of the Smyrna-Aidin Railway are under 45 per cent. of the gross earnings, and it is probably reasonable to expect that for the Haifa Railway they will not exceed 40 per cent., or, say, 36,000*l.*, thus leaving 54,000*l.* as the net revenue.

I am informed that responsible contractors have offered to construct the line from Haifa to Damascus for 5,000*l.* a-mile, including rolling-stock, and at this rate the capital required, exclusive of preliminary and sundry expenses, would be about 800,000*l.* This estimate includes the short branch to Acre, but not the cost of the branch from Nawa to Bosrah. In competent opinion the extension to Bosrah is of vital importance to obtain the full development of traffic which should result from the substitution of railway transport for the present system of carriage by camels.

I have already spoken of the natural facilities at Haifa for the construction of a good harbour. I cannot offer any estimate as to the cost of such an undertaking, but I am assured, and have reason to believe, that it would not be very expensive, and I am decidedly of opinion that the harbour should be undertaken conjointly with the railway. The general conditions and circumstances are such that both harbour and railway must certainly be built at no distant date, and as a joint enterprise each would contribute most materially to the success and profit of the other, whereas, if the harbour should be undertaken under the influence of separate or unfriendly interests, the prejudice to the railway would be serious. The present Concession for the railway gives also an optional right to construct a harbour and quays either at Haifa or at Acre, or at both places.

Cost of construction.

Haifa port.

#### *Jaffa-Jerusalem Railway.*

The Jaffa-Jerusalem Railway is approximately 52 miles long. It is a narrow-gauge line, 1 metre wide. The railway was opened towards the close of the year 1892. The Concession dates from 1888, and includes the right to make branches to Nablous and Gaza. The capital of the Company is 160,000*l.* in shares, and 800,000*l.* in 5 per cent. bonds.

Concession and capital.

The working of this railway has so far not proved very profitable. I have not been able to obtain any precise figures as to the traffic and working expenses, but it is stated that the net profit has been under 2,000*l.* per annum, and such a return is insufficient to pay the interest on the bond capital. Hitherto this railway has been almost entirely dependent on its passenger traffic, which at certain seasons is very considerable, and is steadily increasing. It is, however, hoped that a prolongation to the sea, offering greater facilities for goods traffic, will give to railway carriage a decided advantage over the old system of transport by pack animals, which has till now maintained a successful competition.

Results of working.

There is no port at Jaffa, and no special facilities for the construction of one, whilst the sea in winter is often for days together so boisterous that it is impossible to land or to embark. The exports from Jaffa consist principally of barley and oranges, and amount to about 50,000 tons annually. The extension of the railway to Nablous might increase the trade, and in time an important increase of production for export will result from the establishment of the Jewish colonies in Palestine.

Possible extensions.

In addition to the project of an extension to Nablous, there are many other schemes for extending the Jaffa-Jerusalem Railway, and amongst others it has been proposed to include this line in a system which should connect Alexandria and Port Saïd with Damascus. I do not think that any of these schemes are likely to be carried out at present, and in any case it would seem difficult for a narrow-gauge line leading only to an exposed roadstead to assume importance in a large trunk-line system.

The railways described in the foregoing pages, and having their termini on the sea-coast at Beyrout, Haifa, and Jaffa, are the only ones in Syria which have so far been constructed, or on which any serious work has been done. A Concession has, however, been given for another line from Damascus to Biredjik, on the Euphrates, by Homs, Hama, and Aleppo. This line would be about 280 miles long, and the Concession has been taken over by the same Company which owns the Beyrout-Damascus-Hauran Railway. At one time the project assumed great importance, on the supposition that the Anatolian Railway would be rapidly pushed forward to the head of the Euphrates, and that, by a junction on that river, Damascus and Aleppo would be placed in communication with a grand trunk line from Constantinople to Bagdad. Nothing beyond preliminary surveying has, however, as yet been undertaken, and I cannot share

Damascus-Biredjik Concession.

the view of the special value of the proposed railway. It is true that it would unite Damascus and Aleppo, both important centres, and that it would pass through a rich country between these towns, but I am inclined to think that it would have to depend almost entirely on local traffic. It would not afford a satisfactory communication between Aleppo and the sea, not only because of the considerable distance between Aleppo and the port of Beyrout, but also on account of the difficulties of shifting from the narrow-gauge line between Damascus and Beyrout to the proposed new line, which is to be of the ordinary broad gauge. Aleppo is a town of about 130,000 inhabitants, and is a considerable trading centre, but, for reasons which I have already given, it has lost its former special importance, and is unlikely to regain it, whilst the natural port is Alexandretta, to which the distance is about 90 miles, as compared with about 270 miles to Beyrout.

From all I can learn, it seems unlikely that the Damascus-Biredjik Railway will be proceeded with immediately, and if the prejudices which exist at Constantinople against a direct line from Aleppo to Alexandretta should continue to prevail, I should say that it would prove more profitable to unite Damascus and Aleppo, and, abandoning the prolongation to Biredjik, to make a branch to Tripoli. There is a fairly easy road between Homs and Tripoli, and the latter offers advantages as a port from which the produce of the country between Damascus and Aleppo could be profitably exported.

I should mention that the concessionaires for the Biredjik Railway have been endeavouring to get the trace of the line altered, and to run it from Homs to Baalbek to join the Beyrout-Damascus line in the valley between the Lebanon and the Anti-Lebanon. This change of trace would be advantageous to the northern towns, by avoiding crossing the Anti-Lebanon to reach the sea, but it would not give the same advantages to Damascus as a direct line between that town and Aleppo.

The Damascus-Biredjik Railway Concession includes a guarantee to the Company of a gross revenue of 12,500 fr. per kilom., or about 800l. per mile. With this guarantee the Biredjik Railway might prove a profitable concern to the investor, independently of considerations as to whether its trace and other circumstances were such as to be likely to secure large traffic returns. The other railways in Syria have no Government guarantee.

#### *Other Railway Proposals in Southern Turkey.*

It would be difficult, and I think useless, to enumerate all the varied proposals for railway construction which have not yet reached the initial stage of obtaining a Concession from the Government, and for the majority of which there is no probability of the necessary capital being subscribed, even if Concessions were granted. There are, however, two proposals worth consideration, namely, that to run a narrow-gauge railway along the Syrian coast from Tripoli southwards, and the proposal to make a railway between Bagdad and Khannikin, on the Persian frontier.

The narrow-gauge coast-line is designed in the interests of the Beyrout-Damascus-Hauran Railway Company, and more particularly to benefit the port of Beyrout, the prosperity of which concerns that Company very closely. Doubtless the proposed railway, which will be in the nature of a steam tramway, and the section of which between Tripoli and Saida is likely soon to be built, will secure a fair passenger traffic, but it remains to be seen how it will be able to compete with pack animals for the goods traffic. It has been observed that as a result of the heavy port charges in Beyrout the fruit and other produce of the rich districts along the neighbouring coast is now frequently shipped direct from the minor ports of the coast instead of being sent, as formerly, to Beyrout for shipment. This diversion of traffic has been a considerable loss to Beyrout, and it is hoped that the proposed railway will restore the trade to its original channel.

The special importance of a railway between Bagdad and Khannikin lies in the fact that sooner or later it would almost certainly become an important section of a great trunk line connecting Tehran, Bagdad, and the Bosphorus, and eventually, perhaps, reaching India, by a branch from Kermanshah, through Ispahan and Yezd, eastwards.\* Pending the possible realization of such larger schemes, the Mahommedan pilgrims (Shiite and Sunnite) from Persia, Central Asia, and Afghanistan, who necessarily take the caravan road through Khannikin and Bagdad to reach the holy places of Kerbelai and Mecca, would surely use the railway if it were available.

In addition to the pilgrim traffic, there is also a very important movement of goods along the road from Bagdad through Khannikin into Persia. This road is the only one which presents no serious physical difficulties for communication between the Persian

\* See Map II.

Biredjik-Tripoli route.

Government guarantees for Syrian railways.

Tripoli-Saida steam tramway.

Baghdad-Khannikin route.

Traffic to Persia and India.



Gulf and the great central plateau of Persia, the most populous and fertile portion of that country. All heavy merchandize from Europe, or India, for Ispahan or Tehran, now takes the route of the Persian Gulf to Bussorah, and thence by the Tigris to Bagdad, and by Khannikin into Persia, and the absence of physical difficulties which established this as the great caravan road of the past will surely lead to its becoming the great railway highway of the future.

With such prospects, it would seem reasonable to suppose that a Bagdad-Khannikin railway would from the start prove a paying concern, and that, as regards a fair return on capital invested, it would not require the support of a Government guarantee. In this respect it is a notable exception to most other proposals, the realization of which is almost invariably dependent on the hopes of a Government guarantee, and with the views at present prevailing in Constantinople it would seem improbable that any fresh railway guarantees would be given for a long time to come.

I now turn to the railways of Anatolia, where five Companies are already working. These are, in order of importance as regards mileage, the Anatolian Railway Company, the Smyrna-Aidin, the Smyrna-Cassaba, the Mersina-Adana, and the Moudania-Broussa.

#### *The Mersina-Adana Railway.*

The Mersina-Adana Railway is at present of relatively small importance, but it has been frequently proposed to prolong this line to Marash and Biredjik, where it would make connection with the Syrian system, if the railway for which, as I have stated, the Concession has been granted, be built from Damascus to Biredjik.\* Such a prolongation would greatly increase the importance of the Mersina Railway, but it seems doubtful if the scheme will be carried out unless a Government guarantee can be obtained, and there is little chance, for the time being, of the desired guarantee being granted. Another plan for developing the existing railway is to run a narrow-gauge line from Adana northwards, over the mountains, to Eregli and Koniah. I cannot say how far this latter scheme is practical, for, besides the inconveniences attendant on the change from a broad to a narrow gauge,† there is a mountainous, difficult country to traverse between the plains of the Karamanian coast and the elevated lands of the Koniah Vilayet. To make the Mersina-Adana Railway a really profitable concern, it is, however, necessary to extend it so as to tap a larger area of country, and there can be little doubt that if a railway from the south should reach Koniah it would draw the produce of the surrounding districts to the sea at Mersina, to the prejudice of the Anatolian Railway and of the lines which now carry this produce to Smyrna. This fact may, however, prove fatal to the project, for a Concession would naturally be opposed by the Companies already interested in the Koniah traffic, and as two of these are in the enjoyment of Government guarantees, the immediate pecuniary interests of the Government are involved in protecting them from dangerous competition.

The Concession of the Mersina-Adana Railway is for ninety-nine years from 1883. The line was opened to traffic in August 1886. The share capital of the Company is 165,000*l.*, the greater part of which was subscribed in England, and there was a primary issue of bonds, also for 165,000*l.*, but the bond capital has since been increased, though to precisely what figure I am unable to state. The expenditure of so large a capital would seem to indicate considerable mismanagement when the enterprise was started, for the length of the line is only 67 kilom., the country traversed is quite flat, and there is only one bridge of any importance, that over the Cydnus, which is, however, a considerable river, and liable to floods. The rails are of steel, and the sleepers wood; the rolling-stock consists of six locomotives and 104 waggons; the buildings and sheds are not extensive. Two mixed trains are run each way daily. The gross earnings reached, in 1891, a maximum figure of approximately 24,000*l.*, but it would appear that 18,000*l.* to 20,000*l.* might be taken as the fair average annual earning capacity of the line, and that the working expenses should not exceed 55 per cent., which would leave some 8,000*l.* to 10,000*l.* net profit. The profitable working of this railway has been much interfered with in successive years by constantly recurring outbreaks of cholera, leading to the establishment of quarantine cordons which have sometimes completely stopped the traffic.

There is no semblance of a port at Mersina, but there is a good deal of shipping in the roadstead, which is visited by some 900 steamers and sailing-vessels during the

\* See Map V.

† The Mersina-Adana Railway is of the ordinary broad gauge.

course of the year. The plains between the Taurus Mountains and the coast are exceedingly fertile and the climate very mild, frost being unknown. Cotton is the most important product, but the soil produces a great variety of valuable crops, including tobacco, opium, and all kinds of grain and fruits. In 1894, 40,000 bales of cotton were carried from Adana to Mersina, and 5,000 from Tarsus. The total export of cotton from Mersina is said to amount to 70,000 bales. The greater part is shipped to Liverpool, but there are also important shipments to Marseilles and Trieste. The largest recorded traffic returns on the railway were in 1891 and 1892; in the former year some 69,000 tons of goods and over 73,000 passengers were carried, and in 1892 the goods traffic was nearly 58,000 tons and the number of passengers over 90,000. The chief interest in the railway, and the management, have recently passed into French hands.

*Smyrna-Aidin Railway.*

The original Concession for a railway from Smyrna to Aidin was granted in 1856 to English capitalists, and the line has remained a purely English concern. It has been constructed by English engineers, it is worked under English management, and only English material has been employed. It is therefore satisfactory to note that, so far, it is the only railway in Asiatic Turkey which, on its own merits and without Government assistance, has proved a profitable concern, whilst the Government revenues, and the prosperity of the population of a large province, have been greatly increased by the remarkable development of the fertile districts opened up by the steady progress of the enterprise.

Mileage.

The original length of the line, to Aidin only, was approximately 81 miles, but frequent extensions have now brought the total mileage, including branches, up to 318½ miles, and Concessions already granted give the Company the right to make several additional branches, of which those to Buldur and Sparta would appear specially important.

Capital.

The share capital of this Company is 892,000*l.*, in 20*l.* shares, and there have been a succession of bond issues bringing the outstanding bond liability up to 2,808,440*l.* Of this bond capital, 709,600*l.* are 6 per Cent. bonds, redeemable in 1907; 898,900*l.* are 5 per Cents., redeemable in 1910; and the balance are also 5 per Cents., but redeemable in 1935. The Concession lasts till 1935, when the Government can exercise an optional right of purchase; but to exercise this right, a sum of 650,000*l.*, the agreed amount of the Government debt to the Company, will have to be paid, in addition to the purchase price. The valuation for purchase which is already fixed in general terms, will, with the additional 650,000*l.*, more than repay all the capital which has been invested in the railway.

Terms of Concession.

Construction and arrangements with the Government.

Although the Concession for the railway to Aidin was granted in 1856, the line was not opened till July 1866. Very great difficulties were encountered in getting through what is known as the Ephesus Pass; modifications had to be made in the route chosen, and new arrangements were entered into with the Government, under which 6 per cent. interest was guaranteed on the whole capital, increased by an issue of 709,600*l.* 6 per Cent. bonds. For many years the Company struggled on under great difficulties; the Government guarantee payments fell hopelessly into arrears, and the traffic over the comparatively short section from Smyrna to Aidin, was insufficient to yield any profit on what has proved to be the most expensive portion of the whole system, both in construction and working. In 1879 a new Convention was made with the Government, under which speedy payment of arrears of interest was promised, and a Concession was granted for an extension from Aidin to Seraikeui, and for a branch to Thyra. From the opening of the extension of the line to Seraikeui, in 1884, there was an immediate and rapid increase in both gross and net earnings, and the Company definitely entered on an era of prosperity, which has so far suffered only temporary checks from such causes as harvest failure, and cholera quarantines interfering with traffic. The success of the Seraikeui extension encouraged the Company to push on with their original project of tapping the elevated plateaus of the interior of Anatolia, and eventually reaching Koniah, and perhaps the head of the Euphrates Valley. In pursuance of these plans a fresh Convention was made with the Government in 1888, and a Concession was granted for a further extension to Diner, and for various branches, including that since opened to Tchivril, the Company at the same time abandoning all claims both for arrears, and for future payments of interest, and accepting, with a prolongation of the Concession to 1935, the optional right of purchase by the Government in that year, on the conditions

already mentioned. The extension to Diner was opened in 1890, and at once produced the anticipated satisfactory results in the development of traffic.

Table I, which is an abstract from the accounts of the Railway Company, shows the results of every successive extension of the line, and gives remarkable evidence of the wisdom of the policy which, in spite of many discouragements, steadfastly adhered to the original plan, and slowly but steadily pushed on the main line, whilst adding well-chosen short branches as feeders. The years 1882, 1884, 1889, 1890, and 1892 all mark epochs in the history of the prosperity of the railway, and correspond with successive increases in the total mileage. The revenue, depending on the agricultural prosperity of the districts served, is naturally somewhat fluctuating, and notably in the years 1890 and 1894, and again in the first half of the current year, it suffered much from bad harvests and cholera epidemics, but the excellent harvest secured this summer, is once more producing most satisfactory traffic Returns, and the present half year appears likely to prove more prosperous than any preceding similar period;\* and this is specially important, as, on average, fully two-thirds of the annual revenue is earned in the second half of the year, when the crops are being moved for exportation.

Traffic Returns.

It is now twelve years since the results of the first important extension of the Aidin Railway justified the policy of steadily pushing on towards the interior, and the later extension to Diner having proved equally profitable, it would seem that the time had arrived for a further move eastward. This next move would naturally take the form of an extension to Tchai, as shown on Map No. III. Tchai is some 3,800 feet above the sea level, and 1,000 feet above Diner, and this considerable elevation is fairly maintained on the plateaus extending in the directions of Kutaia and Koniah. These plateaus are fertile and sufficiently well watered; they produce good crops of cereals, and fine pasturage for cattle, which are more numerous here than in most parts of the country. These circumstances show the importance of reaching Tchai, where, moreover, a junction would be effected with the Anatolian Railway, which has already reached Karahissar, and is being rapidly pushed forward to Akshehr and Koniah. Unfortunately for the Aidin Railway Company, the Turkish Government has so far refused to grant the necessary Concession for the extension of the line beyond Diner, and consequently, when the Anatolian Railway is opened to Koniah, the Aidin Company are likely to lose some of their traffic dependent on the shipment from Smyrna, of produce of the Koniah Vilayet. This traffic has hitherto reached the Aidin Railway at Diner, but Diner is also fed by other important and nearer districts, such as Buldur and Sparta, and it is impossible to distinguish what proportion of the movement at this station is dependent on the country now likely to be cut off by the competition of the Anatolian Railway. The distance from Tchai to the Bosphorus is, however, considerably greater than the distance to Smyrna, and the latter port offers so many advantages for export, as compared with Constantinople, that caravans of camels will doubtless continue to a certain extent to follow the old route from Tchai to Diner, and the actual loss to the Aidin Company may not prove very serious.

Proposed extension.

Whatever may be the reasons, or the influences at work in Constantinople, which have hitherto prevented the granting of the Concession to the Smyrna-Aidin Company for the prolongation of their line to Tchai, this necessary prolongation must some day be made. A glance at the map† shows clearly that until a good railway is built from Koniah to a port on the Karamanian coast, the natural outlet for the exportation of the produce of the highlands, from Kutaia to Koniah, is Smyrna, and, in speaking of the Mersina-Adana Railway, I have already alluded to the difficulties of crossing the great range of mountains between Koniah and the southern coast of Anatolia. Ephesus, Pergamos, Magnesia, Laodicea, Hierapolis, and numerous other important cities all lay in the very fertile country watered by the Meander, the Hermes, and the other rivers which rise in the high mountains separating the elevated plateaus of Kutaia, Karahissar, and Koniah from the valleys through which these rivers all flow in an easterly direction to the Levant.‡ The course of the Aidin Railway to Diner, with its projected extension to Tchai, marks the route by which the famous ancient cities of Asia Minor conducted their important commerce with the interior of Anatolia, and pushed their trade eastwards to the Euphrates and the Persian frontier. From Gongeli (Laodicea) this road was common to Pergamos and Ephesus, the Bash Tchesme Pass affording the only practicable road for wheeled traffic, or even good road for loaded camels, to reach the great elevations of the interior. The trade along this route has never disappeared, and its continuance, and the fact that no other good road exists between the Levant and the

\* The earnings from June 30 to September 21 exceed those for the same period in 1894 by over 26,000%.

† Map IV.

‡ Map III.

interior, will surely, sooner or later, force the construction of the most useful section of railway proposed by the Aidin Company, and it may be noted that, when this section is made, the Anatolian Railway will cease to compete with the Aidin system, and the line between Kutaia and Koniah will become a valuable feeder to the English railway.

Condition of railway.

A most striking feature of the Smyrna-Aidin Railway is the excellent condition of the permanent way, and of all the material, and the solidity and capaciousness of the buildings of all kinds, stations, warehouses, and workshops. The yards, particularly at Smyrna, are very extensive, and ample ground, chiefly reclaimed from the sea, has been inclosed by the Company, whilst arrangements have been made by which goods trains run right down to the shipping wharves. The rolling-stock consists of 51 locomotives, 130 passenger coaches, and 1,155 goods waggons and trucks. The rails are of steel, except for a small portion of the line between Smyrna and Aidin. When the railway was first built to Aidin iron rails were used, but these have been gradually changed for steel, and it is expected that the whole line will have steel rails before the end of next year. The train mileage averages over 500,000 miles a-year; and the working expenses have during the last six years not exceeded an average of about 45 per cent.

Gradients.

The railway presents no difficulties for working, either from excessive gradients or from climatic influences. Crossing the Ephesus Pass was a serious undertaking in construction, but the line has been so well laid out that the ascent is as gentle and uniform as possible. The steepest up gradient going inland is 1 in 36, and the steepest down gradient, to Balatchik, is 1 in 50, and as all the heavy traffic is to the sea, these gradients present no real difficulty. Finally, with regard to the extension to Tchai, I may mention that the line has been carefully surveyed, and that the estimated cost is 750,000*l.* The first ascent on leaving Diner will be heavy work, but the remainder of the route is perfectly easy.

Threatened competition.

I have spoken of the approaching competition of the Anatolian Railway, for a certain portion of the traffic now following the Smyrna-Aidin line; this competition may not prove serious, but, unless circumstances change, a fresh and probably more dangerous rivalry is threatened, in a few years, from the eastward extension of the Smyrna-Cassaba Railway.

#### *The Smyrna-Cassaba Railway.*

Concession and capital of old Company.

The original Concession for a railway from Smyrna to Cassaba was given to an English Company in 1863, and the line, which was 58½ miles long, was opened to traffic in 1866. In 1872 the Company obtained a Concession for an extension to Alashehr, a further distance of 47½ miles, and at the same time made a loan of 500,000*l.* to the Government, on which interest at 7 per cent., and amortisation at the rate of 1 per cent., were guaranteed by the Government share in the revenue of the railway. In 1888 the Company undertook to construct a branch from Magnesia to Somah for account of the Government, and to work this branch, 57 miles long, for 50 per cent. of the gross receipts. As a result of these various arrangements, and of the non-payment by the Government of various sums claimed by the Company, under the terms of the different Conventions, the total debt of the Government to the Company was estimated in the balance-sheet at the end of 1893 at 2,207,584*l.* At this date the capital of the Company was distributed as follows: ordinary shares, 393,740*l.*; preference shares, 125,000*l.*; 5 per Cent. debentures, 985,100*l.*; the total length of the line with branches was 105½ miles, and the cost of construction was estimated at approximately 1,600,000*l.*, although there had been no engineering difficulties, and there were no tunnels or severe gradients.

Traffic and working expenses.

The country served by the Smyrna-Cassaba system is very fertile, and the exports of the produce of these districts from Smyrna, in favourable seasons, is very considerable, but the total distance from Smyrna to the termini at Cassaba and Soma is comparatively short, and camel caravans still maintain an active competition for the traffic. This railway also labours under the considerable disadvantage that its Smyrna terminus is in the middle of the town, away from the port, and excessively confined and cramped for space. The rolling-stock consists of 22 locomotives, 108 passenger carriages, and 468 goods waggons and trucks. The gross traffic receipts in 1891 were 134,797*l.*; in 1892, 138,679*l.*; and in 1893, the last complete year under the original English Company, they were 141,948*l.*, or approximately 80*l.* per mile, whilst the working expenses were kept at the low rate of about 41 per cent. These receipts do not compare favourably with those of the Aidin Company, and it would seem probable that the low rate of working expenses was, to a certain extent, attained by starving the line and

postponing necessary works and improvements. A prolongation from Alashehr to Oushak would certainly increase the revenues of the railway, but the doubtful position of the affairs of the Company, the difficulties connected with the settlement of the debt due by the Government, and the great engineering difficulties, and consequent cost of the proposed extension, rendered it a hazardous undertaking, and under all the circumstances the Company were probably well advised in accepting an offer for the purchase of their property, which, in July 1894, passed into new hands.

The Company which has taken over the Cassaba Railway was founded to work a concession granted to M. Nagelmackers, under which, on condition of his satisfying all the claims of the old Company on the Government, purchasing all their rights, and spending 100,000*l.* within two years, on improving the line, and replacing the old iron rails by steel, the Government guaranteed an annuity of 92,400*l.*, for ninety-nine years, this annuity being secured by the gross receipts of the existing railway, and further by the tithes on cereals in the Sandjak of Aidin, which, for the purpose of the guarantee, have been assigned to the Administration of the Turkish Public Debt. The Concession also includes an arrangement for the construction, within six years, of the prolongation of the railway from Alashehr, via Oushak, to Karahissar, and a guarantee of approximately 1,196*l.* per mile for this extension. The other principal conditions of the Concession are, that, during the first fifty years, the Company are to take 50 per cent. of the gross receipts of the now existing railway, for working the line, and the balance is to go to the Government, whilst during the remaining forty-nine years, the respective shares of the working Company and of the Government, are to be 45 per cent. and 55 per cent. Should the gross receipts exceed 870*l.* per kilometre (approximately 1,392*l.* per mile) the Government are to receive 32*l.* per mile (approximately), plus 40 per cent. of any such increase. The Government has reserved to itself the right to take over the working of the old line, and to purchase the projected extension, when the Concession has run thirty years. The conditions of such retrocession are, that the Government shall, until the expiration of the full term of the Concession, pay an annuity equivalent to 50 per cent. of the average gross receipts, during the five years preceding the exercise of their optional right, and that the amount of this annuity, as regards the old Smyrna-Cassaba lines, must in no case be less than the amount guaranteed in the Concession of these lines, and as regards the extension, not less than 740*l.* per mile (approximately) of the new line.

To carry out the conditions of the Concession, a first issue has been made of 2,262,400*l.* 4 per Cent. bonds, at a price of 83, the interest on these bonds being guaranteed by the Government annuity above mentioned, and with the funds thus provided the old Smyrna-Cassaba Company were paid a sum of 1,434,000*l.*, as the definite purchase price of all their rights and property. The next step was to provide capital for commencing the extension to Karahissar, and for this purpose a share capital of 640,000*l.* was created in 20*l.* shares, and a second issue of 2,800,000*l.*\* of bonds was made at a price of 86½, the guarantee of a gross mileage revenue on the new line, being offered as security for the interest on this issue.

The question of selection of a route for the Karahissar extension has provoked much discussion on account of the engineering difficulties to be encountered. The easiest route to Oushak would be from Salikli on the existing line, along the valley of the Hermes, but this would be 272 kilom. long, and would pass through a very unproductive country, bringing no appreciable new traffic to the railway until it reached Oushak. The most productive route but one which would involve greater difficulties in construction would run from Alashehr towards Seraikeui, and passing by Derbend, turn northwards through Guneh and Gubek. This route would be 274 kilom. long, and near Derbend it would infringe on the zone of 40 kilom. from the main Smyrna-Aidin line, which, under the Concession of the Aidin Company, must not be traversed by the railway of any other Company, and it is quite certain that the Aidin Company would not consent to an infringement. The middle route is the shortest, 247 kilom. from Alashehr, up the Yali Dere Valley, to Gubek, and thence to Oushak and Karahissar. This route would be more productive than that by the Hermes Valley, though not so good as the southern trace, and it would keep clear of the forbidden zone, but it would probably be found to be the most expensive per mile, the country being exceedingly difficult between Aineghol and Gubek. It has been a choice of evils, but according to the latest statements, the middle route has been finally accepted as the best from all points of view, and the work of construction of the railway will, it is said, be immediately proceeded with.

\* There has been a further creation of 300,000*l.* of bonds, but I have no information as to whether these have been issued.

Proposed extension.

Sale of the railway

Conditions of sale and new Concession.

Capital of new Company

Routes for prolongation.

The country between Oushak and Karahissar is said to be even more difficult, as regards awkward gradients, than the approaches to Oushak, and it is probable that no work will be done on this section until the line is completed as far as Oushak. The cost of the whole undertaking is variously estimated, but it would appear that 2,000,000*l.* is far from an excessive figure. The new Smyrna, Cassaba, and Prolongation Company has entered into an arrangement with a French Construction Company for both the construction and the working of their railway, but it will have been impossible to fix the cost of the line until the route was definitely decided.

If the projected extension be built for 2,000,000*l.*, and no difficulty occurs in connection with the realization of the Government guarantee, the interest on the capital for the new extension is fully secured. Taking the length of the prolongation at 247 kilom., or approximately 154 miles, the kilometric guarantee for gross revenue would amount to about 184,280*l.*, and allowing even 50 per cent. for working expenses, this would yield over 4½ per cent. on the 2,000,000*l.* Much confidence is expressed that, when the whole line is opened, the traffic returns will be sufficient to leave but a small margin to be covered by the Government guarantee, but it is to be noted that the new line will have to compete to a greater or less extent with both the Smyrna-Aidin system, and with the Anatolian Railway, and that whilst the Government guarantee amounts to 1,196*l.* per mile, the highest returns earned by the Aidin line since its extension to Diner, and when there was no competition from any other railway, have been 1,099*l.* per mile. As regards the Government annuity of 91,600*l.* on the existing line, this will, to a considerable extent, be covered by the Government half share in gross traffic returns. This half share, judged by the average receipts of the last three years, would be worth approximately 70,000*l.*, and with improvements in the condition of the railway, and the assistance of the extensions, this average figure should be exceeded. The annuity, and the margin above working expenses, which the Company should secure out of their half share of gross revenue, ought to assure a satisfactory return on the capital invested in the purchase of the business of the old Smyrna-Cassaba Company.

I now come to the question of the effects of the competition between the Smyrna-Aidin system and the Cassaba Railway when the latter shall have been extended in accordance with the present plans. The revenues of both railways must be seriously affected by the results of this competition, but it is difficult to say beforehand what share of the Aidin traffic will in the future be drawn to the new line. Calculations have been made according to which it is estimated that the new railway will cause a loss to the Aidin traffic of as much as 80,000*l.*, but this would appear an exaggerated figure. The actual receipts of the Aidin Railway, at Tchivril, and Diner, for the last four years, show respective averages of approximately 30,000*l.* and 64,000*l.*, and these are the only returns which seem likely to be affected by the impending competition. As regards Tchivril, it is clear that it will lose all the traffic of Oushak and of the country towards Gubek, and this is a very important item, but there is a rich-producing country around Tchivril itself, and a very rich district due north of this station and towards Sandikli, and as this will not be touched by the new railway, 20,000*l.* would appear to be a very large estimate of the loss to be incurred in this direction. Diner would seem to be still more independent, for the traffic from Buldur and Sparta will certainly not be interfered with, and I have already spoken of the possibility of the maintenance of a considerable proportion of the traffic towards Tchai. The competition with Diner can only begin when the new line reaches Karahissar, and it is unlikely that it will be completed before the expiration of the full term of six years allowed by the Concession. The competition for the Oushak traffic will commence at a much earlier date, but in view of the unavoidable engineering difficulties in making the prolongation from Alashehr to Oushak, this section is hardly likely to be opened for another three years, and much may happen to alter circumstances during such an interval of time.

#### *The Anatolian Railway.*

This is the most important railway in Asiatic Turkey. The Concession includes a main line from Haidar Pasha, viâ Ismidt, Eskishehr, and Angora to Cæsarea, and a branch from Eskishehr, viâ Karahissar, to Koniah.\* The conceded mileage is approximately 875 miles. The lines from Haidar Pasha to Angora, and from Eskishehr to Karahissar, a total of 468 miles, are now working; the section from Karahissar to Akshehr, a further 60 miles, will be open by the end of this year, and, according to the terms of the Conces-

\* Map IV.

sion for the Koniah branch, the final section of about 105 miles, from Akshehr to Koniah, will be completed by November 1896. This makes an important total of approximately 633 miles which will be working by the end of next year. The remaining 242 miles which have been conceded, represent the prolongation from Angora to Cæsarea, and as the route for this section has not been decided, and other questions have arisen in connection with its construction, it is unlikely that this portion of the railway will be open for some years to come.

The railway between Haidar Pasha and Ismidt, 58 miles long, was being worked for the Government under a contract with two British subjects, Messrs. Alt and Seefelder, when, in 1888, the Government gave a Concession for the construction and working of a prolongation from Ismidt to Angora, 302 miles in length, and at the same time undertook to hand over to the concessionnaires the Haidar Pasha-Ismidt Railway, with rolling-stock, material, and appurtenances, complete, for a sum of 240,000*l*.

Purchase of Haidar Pasha-Ismidt Railway.

The concessionnaires, a Syndicate headed by the Deutsche Bank of Berlin, acquired also the following privileges: the Government guaranteed a gross mileage revenue, on the Haidar Pasha-Ismidt section, of 660*l*., and on the Ismidt-Angora section 960*l*. per mile, providing, however, that it should receive 25 per cent. of any revenue in excess of 960*l*. per mile for the whole line; the Government further guaranteed interest, at the rate of 4 per cent., during construction, on all sums, not exceeding 9,600*l*. per mile, which should be certified as having been expended on the works, and, finally, the Government ceded all mining rights within a limit of 20 kilom. on either side of the railway.

Concession and guarantees.

In February 1893, the Anatolian Railway Company, which had been constituted to carry out the Concession for the line to Angora, obtained a further Concession for an important branch from Eskishehr, via Kutaia, Karahissar, and Akshehr, to Koniah, and also for an extension from Angora to Cæsarea. The first of these lines will be some 266½ miles long, or with the branch from Alayund to Kutaia, about 273 miles. The route of the extension from Angora not having been as yet determined, it is impossible to fix the length of this section, but if it should pass through Yuzgat, which appears most probable, it cannot be less than 256 miles. The Concession guarantees a gross revenue of 945*l*. per mile on the Eskishehr-Koniah branch, and 1,116*l*. on the Cæsarea extension, but the total amount payable on account of guarantee for the Koniah branch is not to exceed 327*l*. per mile. The Government is to receive 25 per cent. of all gross revenue receipts in excess of the guaranteed rates per mile. The concessionnaires are accorded the right of constructing a harbour, quays, warehouses, &c., at Derindji, on the Gulf of Ismidt, the Government participating in the net profits of this enterprise to the extent of 25 per cent. Finally, and possibly of great importance in the distant future, the concessionnaires are bound to build a railway from Angora to Sivas as soon as the receipts of Haidar Pasha-Angora Railway shall, during three consecutive years, reach the figure of 960*l*. per mile; and, further, as soon as the receipts of all the lines already undertaken shall be sufficient to free the Government from any payments on account of guarantee, the concessionnaires must prolong their line from Sivas to Diarbekir and Bagdad.\* The term of the Concession is for ninety-nine years, but the Government reserves the right to purchase the whole system after thirty years, on payment of an annuity equivalent to 50 per cent. of the average gross receipts for the previous five years, always providing that 480*l*. per mile for the section Haidar Pasha-Angora, and 640*l*. per mile for the remainder, shall be the minimum rates for calculating the payments to be made.

Concession for extensions.

The building of the Anatolian Railway was undertaken by a Company founded for the purpose at Frankfort under the style of "Société pour la Construction de Chemins de Fer en Asie Mineure." The Company was formed by the association of the German financial group, headed by the Deutsche Bank, who obtained the Concession, with the Comte Vitali, the well-known Paris railway contractor, who had already done much successful work in Turkey. The Construction Company undertook, under forfeit, to complete the various sections of the line on specified dates, and to be answerable for their acceptance to the Turkish Government. The actual work was undertaken by nineteen sub-contractors, the Construction Company reserving the right of furnishing the necessary cement and iron-work. It is to be remarked that of these sub-contractors five were French, five Italian, one Swiss, one a Russian subject, and one a Turkish subject, a large proportion of the workmen employed were foreigners, chiefly Italians, Montenegrins, and Dalmatians, and there was not a single Englishman in any way connected with the enterprise. The controlling technical staff was entirely German. The price of

Construction of main line.

\* Maps V and II.

ordinary labour on the line was from  $14\frac{1}{2}d.$  to  $22d.$  per diem, whilst the Italian masons earned  $4s. 6d.$  a-day, and good stone-dressers were paid as much as  $7s. 2d.$

The construction of the railway proceeded in a very satisfactory manner, notwithstanding the very great physical obstacles to be overcome in certain portions of the route, and the extra expense and delays caused by the prohibition against the use of dynamite in blasting. The Turkish Government allows no explosives except the gunpowder which it furnishes itself, and which contractors state is frequently of inferior quality. The first section of the new line to Ada-bazar, 40 kilom., was opened in the beginning of June 1890. This section presented no special difficulties in construction, but the workmen suffered much from fevers, and from an epidemic of influenza. From Ada-bazar, the railway entered the valley of the Sakharia, where there are heavy cuttings, some tunneling, and an important bridge, and where the workmen were for a time somewhat demoralized by the attacks of the "Tcherkess," lately settled in the district. This section, Ada-bazar to Levke, 64 kilom., was opened in January 1891. From Levke to Biledjik, 36 kilom., the line winds through a very hilly country, following the course of the Sakharia, and its affluent the Kara-su, but by keeping the valleys, stiff gradients were avoided, though the station of Biledjik is over 950 feet above sea level. From Biledjik, the real difficulty of the line begins with the necessarily rapid ascent to the elevated plateaus of the interior; the next station after Biledjik, only  $10\frac{1}{2}$  miles distant, is 1,070 feet higher, and the difference in level necessitates a gradient of 1 in 40, extending over several miles, though with suitable level intervals. The cost of the section of 50 kilom., from Biledjik to Ine-oenu, was enormous, cuttings, tunnels, and bridges rapidly succeeding one another as the road leaves the valley of the Kara-su, and the 8 miles between Biledjik and Kara-keui are estimated to have cost some 38,000*l.* per mile. In spite of all these difficulties, increased by intense cold, which for a time, in winter, stopped work on the higher levels, the railway finally reached the station of Ine-oenu, at an altitude of 2,800 feet, in March 1892. The remainder of the road, to Eskishehr and Angora, involved no special difficulties of construction, and was completed in December 1892. Angora is at an altitude of approximately 2,760 feet, and between Eskishehr and Angora there is a descent to a minimum altitude of 2,220 feet, near Beylik-kupru,\* and a rise to a maximum of a little over 3,000 feet near Polatli.

Work on the important branch from Eskishehr to Koniah was commenced the beginning of September 1893, but was much interrupted by an outbreak of cholera which occurred shortly afterwards. The building of the line was undertaken by a Company founded for the purpose under the auspices of the International Bank Gesellschaft, an institution which had already been engaged in similar enterprises in Turkey. By the terms of the Contract for construction, the line had to be completed to Koniah by the 1st November, 1896, the work being done at a fixed price per kilometre, and under forfeit. The Contract is apparently being well carried out. The first section, to Kutaia, about 48 miles, was opened to traffic in the end of December 1894; the next section, to Karahissar, about 59 miles, was opened in August last, and the line is being rapidly pushed on to Akshehr, another 61 miles, which will be completed by the end of this year. There is little doubt that the final section of some 105 miles, from Akshehr to Koniah, will be open by the end of 1896. There was some pretty heavy work between Eskishehr and Kutaia, but the rest of the line to Koniah does not present any particular difficulty, and nowhere will there be anything approaching the labour and cost involved in the ascent from the sea to the level of the inland plateaus.

The line is single throughout, and of the ordinary broad gauge. The rails and sleepers are of steel, and have been supplied exclusively from Germany, by the Essen and other large establishments. The sleepers are laid 90 centim. from centre to centre, and the line is calculated to admit of a speed of 25 miles per hour throughout. The orders for metal work for bridges were distributed in France, Belgium, and Germany. The rolling-stock consists of 33 locomotives, 182 passenger carriages and vans, and 719 goods waggons and trucks; of these, 13 locomotives, 68 passenger carriages, and 80 goods waggons were taken over with the old Haidar Pasha Railway. The waggons and trucks, other than cattle trucks, have a loading capacity of 15 tons. The rolling-stock was all made in Germany.

The districts traversed by the Anatolian Railway vary greatly as regards physical aspect, relative fertility, and climate, and consequently in the nature of the agricultural produce, on the transport of which the receipts of the line must chiefly depend. The first section from Haidar Pasha to Ismid passes through a fertile, well-populated

\* Also called Beylik-Ahur. See Map IV.

Construction of  
Koniah branch  
line.

Description of  
railway.

Districts traversed  
by main line.



district, along the shores of the Gulf of Ismidt, where vines, fruit trees, tobacco, and corn all grow well. This district is well watered by streams from the neighbouring mountains, and the climate is fairly temperate, though snow occasionally falls in winter, and the heat in summer is considerable. The goods traffic between Ismidt and Haidar Pasha is very satisfactory, and the passenger traffic to and from Constantinople, over the portion of the line nearer Haidar Pasha, is very considerable, and steadily increases. From Ismidt to Ada-bazar the line passes through a level fairly well populated, and rich country, to the basin of the Sakharia, and the town of Ada-bazar brings in a very remunerative traffic. From Ada-bazar, along the valleys of the Sakharia and the Kara-su, there are many villages and small towns, but the country is too mountainous to be thickly populated. The Kara-su Valley is in the district of the silk industry, of which Biledjik is an important centre. From the station of Biledjik the railway rises to the colder regions of the plain of Eskishehr, where there is a total change of scenery, and a much more severe climate. The extensive plain of Eskishehr is sufficiently well watered, and offers good grazing grounds, whilst there is also a considerable cultivation of cereals. Eskishehr itself is an important town, which has grown in a remarkable manner since reached by the railway; the population is about 20,000, and includes a number of Tatar emigrants from the Dobrudja.

From the plain of Eskishehr to Angora the aspect of the country is exceedingly monotonous—a series of larger or smaller plains, surrounded by bare, desolate looking hills, with streams, or small rivers flowing in the centre, but little cultivation, and few villages. The average high elevation is maintained, and the climate is trying both in winter and in summer; there is a terrible absence of trees, and the soil, which is fairly productive, under the influence of seasonable rains, is too frequently burnt up by the prolonged droughts which, in unfavourable years, are the cause of distressing famines. There is extensive pasturage, but the country is exposed, and the grass poor, and the cattle look generally in poor condition; sheep, goats, and camels are, however, reared with success in large numbers, and the Angora mohair and wool have long been famous. Where there is water and cultivation, cereals grow well, and there is a considerable production of cotton, besides tobacco, opium, and hemp. The town of Angora itself is exceptionally favourably situated in a sheltered fertile plain, producing, among other things, large quantities of excellent fruits, which, as soon as packing is understood, are likely to become an important article of trade. The population of the town is estimated at 28,000.

The branch from Eskishehr to Koniah passes through a much more favoured country than the line to Angora. The general elevation is about the same, and consequently the cold in winter is pretty severe, but the country is more sheltered by higher mountains, the plains are well watered, and are better populated. The pasturage here is good, the cattle appear in very fair condition, and, though bad seasons are not unknown, good crops of cereals are the rule. Kutaia, Karahissar, and Koniah are all towns of considerable importance, and notwithstanding the competition of the railways having their termini in Smyrna, this branch line ought to develop a very good traffic. Karahissar is a great centre for opium production and trade, and the poppy is largely cultivated in all the surrounding districts.

For the construction, &c., of the main line, Haidar Pasha to Angora, a share capital of 45,000,000 fr., and a bond capital of 80,000,000 fr. were created. Of this share capital, 60 per cent. has been paid up in calls, and the whole of the bonds have been issued on a 5 per cent. basis. For the Koniah branch there was a second issue of shares for 15,000,000 fr., and a further bond capital was created to the amount of another 80,000,000 fr. The calls on the second share issue amounted to 25 per cent. up to the 1st January, 1895, and by the same date half of the additional 80,000,000 fr. of bonds had also been realized. The total share and bond capital subscribed up to January of this year was thus 6,030,000*l.*—out of an authorized 8,800,000*l.*—and there must naturally be further subscriptions to complete and open the line to Koniah. Capital.

In 1893, the total traffic receipts on the main line of 360 miles were 161,522*l.*; and in 1894, 126,058*l.* The working expenses in 1893 were approximately 52 per cent., and the net profit about 77,400*l.*, or 215*l.* per mile. In 1894, the working expenses were nearly 64 per cent., and the net profit 47,168*l.*, or about 131*l.* per mile. The gross receipts per mile in 1893 were approximately 449*l.*, and in 1894 about 350*l.* It is interesting to note that in 1893 a little over one-half the gross receipts were derived from the traffic on the first portion of the line, from Haidar Pasha to Biledjik, approximately 145 miles, the remaining 215 miles to Angora yielding somewhat less than half of the total. The receipts to Biledjik were 570*l.* per mile, whilst the receipts beyond Biledjik were under 370*l.* per mile. Approximately the same proportion for

receipts, on the two different sections of the line, was maintained in 1894. This year, the gross receipts for the first six months have been 56,448*l.*, as compared with 56,523*l.* for the same period in 1894; and up to the 26th August, that is for thirty-four weeks of the current year, the gross receipts were 79,044*l.*, as against 74,820*l.* for the same period last year. In making this comparison, it must however be remembered that from January this year the branch line has been open as far as Kutaia, making an additional 48 miles in work.

Financial results.

The financial results of the working of the main line to Angora, as regards traffic receipts and working expenses, have so far been extremely unsatisfactory; but it is too early to form any very decided opinion as to the possibilities of the future. It must be borne in mind that the railway from Ine-oenu to Angora was only opened in December 1892, and in 1893 the traffic suffered from the disadvantage of this being the first year of working of this considerable section of the line; and still more from the people of the districts newly opened up being unaccustomed to the use of a railway. 1894, when an improvement might have been expected, was an abnormally unfavourable year; for not only was the traffic constantly interrupted by restrictions on account of the cholera epidemic, but there was a serious famine in the districts traversed, and, in addition, a great fall in the price of nearly all the staples of exportation. As regards the Koniah branch, the first short section to Kutaia having been open only some nine months, the traffic returns on this section for such a short period cannot offer any reliable indication of the possible results when the whole line is completed and working to Koniah.

Should it be found necessary to issue the remaining 1,600,000*l.* of the bonds created for the construction of the Eskishehr-Koniah branch, the total capital of the railway would amount to 7,630,000*l.*, and the payment of 5 per cent. interest on this sum would require an annual net profit of 381,500*l.*; or, assuming that working expenses may hereafter be reduced to 45 per cent., the gross annual receipts must be brought up to 693,600*l.*, or about 1,096*l.* per mile for the 633 miles, and this, it will be observed, is a figure somewhat in excess of the amount guaranteed by the Government. Such a situation would be serious for the shareholders, though the bondholders would appear to be quite secure of the interest on their bonds, as long as the guarantee payments are punctually made. I must state, however, that I have no information as to the amount of capital required to complete the Koniah branch; and if it is not found necessary to realize the whole bond capital, the position of the shareholders will be very different, and possibly most satisfactory. Further, as I have already pointed out, it is too early to judge of the earning capacity of the railway, independently of the guarantees, and the very sanguine anticipations with which the enterprise was undertaken may yet be realized. It is at all events clear that the development of traffic on the Koniah branch will have a very material and satisfactory effect on the returns of the Haidar Pasha-Eskishehr section, which will become the terminal of two important lines penetrating the interior in different directions.

Port at Derindje

I have mentioned that the Anatolian Railway Company has been conceded the right to make a port at Derindje, near Ismidt. I cannot but think that goods traffic from the interior would be very greatly increased if this project were carried out. The railway from Angora makes a great detour in going round by Eskishehr to reach the sea at Ismidt, and this circumstance gives a perhaps unavoidable advantage to the camel caravans, which, for the carriage of certain classes of goods, maintain a strong competition. At Derindje there is deep water close to the shore, and if suitable arrangements were made there, for discharging goods direct from the railway waggons into steamers alongside a quay, the railway would evidently enjoy a considerable advantage. But it is not only the question of competition with camels, which has to be considered; the great fall in the price of agricultural produce renders it imperative to seek every means for reducing the cost of delivery on board ship from the producing districts. A suitable port at Derindje would reduce the expense of railway carriage, by the cost of transport over the fifty odd miles of line from Derindje to Haidar Pasha, and, equally important, it would immensely reduce the cost of actual shipment, which, from Haidar Pasha, is complicated and rendered very expensive by the necessity for using barges, &c., to convey goods to the ships lying at Constantinople, the other side of the Bosphorus. This idea of shipment at Derindje is, I presume, sure to be carried out some day, but so far little has been done to advance it, and I am informed that in certain influential quarters there is a very strong opposition to the project, as it is feared that if carried out it would seriously prejudice the prosperity of the favoured port of Constantinople. This fear is doubtless well founded, but the change is a necessity of the times, and the sooner it is faced the better for the prosperity of the Anatolian Railway and of the provinces which that railway has opened up.

*The Moudania-Broussa Railway.*

The construction of a railway to connect the important town of Broussa, the ancient Ottoman capital, with Moudania on the Gulf of Isnik, was undertaken some twenty years ago; but though the line was nearly completed, it was never opened to traffic. In 1891 a Concession for ninety-nine years was granted to M. Nagelmackers, who paid 27,000*l.* for the existing line and material, and undertook to open a narrow gauge railway 1 metre wide, and secured the right to prolong it to Tchitli, in the direction of Boyzuk and Ine-oenu. What remained of the old railway was naturally in the worst condition, but the work of reconstruction was promptly taken in hand by the Société de Batignolles de Paris, under contract to finish the works for a sum of 102,000*l.*, and the line was opened to traffic in June 1892.

Concession.

Construction.

The Moudania-Broussa Railway Company was constituted with a share capital of 20,000*l.*, and there was an immediate issue of 11,000, 3 per Cent. bonds of a nominal value of 20*l.*; the issue price of the bonds was 11*l.* The total nominal capital of the Company, bond and share, is 240,000*l.*

Capital.

There is no kind of port at Moudania, but small coasting-steamers come alongside a jetty close to the railway; larger ships have to lie off at some little distance, and receive cargo from barges. The roadstead is sufficiently sheltered, and the question of constructing a port is only of serious importance from the point of view of reducing cost of discharging and loading vessels. Leaving Moudania, the railway is carried over the line of hills which border the coast, and attains an elevation of 720 feet, within 7 miles of the coast. From this point the line descends to the plain below Mount Olympus, and crossing the plain with a gentle rise, reaches Broussa at the foot of the mountain, with a total length of 26½ miles. The line is well laid out, and though the inclines are long and trying, there are no exaggerated gradients.

Port of Moudania.

Description of railway.

The Moudania Railway enjoys no revenue guarantee from the Government, though the Government claims 25 per cent. of the gross receipts in excess of 640*l.* per mile. Taking working expenses at 45 per cent., the gross annual receipts must amount to 12,000*l.*, or about 450*l.* per mile, to pay the interest on the 3 per Cent. bonds. Interest on the share capital, at 5 per cent., would require another 1,900*l.* of gross receipts, or, in all, say 520*l.* per mile. The first two years that the railway was open did not prove financially successful; the gross receipts in the first twelve months were only 7,287*l.*, and in the second twelve months 10,485*l.*, whilst the working expenses increased from 7,594*l.* during the first period to 9,811*l.* in the second. The high rate of working expenses is, I understand, in part attributed to the imperfect condition of the line and defects in the rolling-stock. Arrangements have now been made with a new Company, which has, I believe, leased the railway, and has substituted steel rails for the old iron ones, strengthened the bridges, and increased the rolling-stock, rendering it also more efficient by introducing a stronger class of locomotive suited for the steep gradients near Moudania. The new Company will also, it is anticipated, soon take in hand the extension to Tchitli. It is too early to judge of the working of the new Administration, but, considering the small cost of construction of the railway, and the extraordinarily fertile country which it connects with the sea, it would seem probable that with some extension and good management it should prove a paying concern. There can be little doubt that, if it received its natural prolongation to Levke, or to Ine-oenu, it would secure a large and remunerative traffic, but much of this would be at the expense of the Anatolian Railway, and the latter being subsidized by the Government it is unlikely that the necessary Concession for such prolongation will be easily granted.

Traffic and working expenses.

Arrangements with new Company.

Proposed prolongation.

*General Notes and Considerations.*

All railways open to traffic, as well as those likely to be opened at an early date, have now been passed in review, but the discussion of the very numerous projects which have been put forward for the construction of railways in Asiatic Turkey would, I think, be an unprofitable undertaking. The experience of existing railways tends to show that the hope of an early return on capital invested in the construction of long trunk lines depends on satisfactory traffic being first secured on a good terminal section, and the line being then gradually pushed forward, as the necessity of extension becomes clearly felt. On the other hand, there is great difficulty in securing sufficient traffic on a short terminal section until it is fed by judicious extensions, and it would therefore seem

Prospects of new undertakings.

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evident that those who undertake to build railways must be content for some years to accept a very poor return on their first investment, unless the interest is secured for a considerable term by a Government guarantee. Apart from the individual merits of particular proposals for railway enterprise, the circumstances I have pointed out are distinctly unfavourable to an early or rapid development of a railway system in Asiatic Turkey. The pressure of the burden already imposed on the Imperial Treasury in meeting demands resulting from the guarantees already given, must cause great hesitation in accepting any further similar liabilities, and the modern investor is so impatient for immediate returns that it is useless to ask for his capital unless he can be promised immediate interest at a fair rate.

The part played by the Government in encouraging railway construction during the last few years, by guaranteeing returns to investors, requires some special consideration. These guarantees apply to the entire Anatolian Railway system, as well as to the Smyrna-Cassaba, that is, to a total length of about 952 miles of railway, without including the projected Damascus-Biredjik line or the Angora-Cæsarea extension, for both of which Concessions have been granted, and which together make approximately another 520 miles.

Government  
liability on railway  
guarantees.

In Table II will be found the amounts of the Government guarantees on each railway. In the aggregate, the guarantees on the Asiatic railways reach the considerable figure of 1,373,557*l.*, but it is difficult to estimate the annual sum which the Government is likely to be really called upon to pay on account of this liability. As regards the guaranteed annuity of 92,400*l.* on the Smyrna-Cassaba line, it will be remembered that under the terms of the Concession 50 per cent. of the gross traffic receipts are to be deducted from the maximum sum guaranteed. We may therefore, I think, in this instance, arrive at a reasonable estimate of the future annual liability by deducting from the maximum annuity 50 per cent. of the average of the gross receipts during the last few years. This figure for the years 1891, 1892, and 1893 is 69,237*l.*, and if this sum be deducted from 92,400*l.* the balance of 23,160*l.* may be taken as a rough estimate of the Government liability until the traffic shall have been sensibly increased by the opening of the proposed extension. For the Haidar Pasha-Ismidt section of the Anatolian Railway, where the gross receipts are guaranteed at the comparatively low figure of 660*l.* per mile, I think it may fairly be assumed that the improvement in traffic which must result from the opening of the Koniah branch will clear the Government from any practical liability. Although the gross traffic receipts of the Eskishehr-Koniah branch are guaranteed at 945*l.* per mile, the Government has in this case limited its total ultimate liability to 327*l.* per mile, or 89,271*l.* for the 273 miles, and this latter sum may therefore be taken as the amount which the Government will have annually to provide, at least for some time to come. The gross traffic receipts of the Smyrna-Cassaba prolongation and of the Ismidt-Angora lines are, without any qualification, respectively guaranteed at 1,196*l.* and at 960*l.* per mile, making the total maximum liability on the two lines 474,196*l.*, from which will be deducted whatever revenues may be earned. In view of the results hitherto obtained in working the Ismidt-Angora section of the Anatolian Railway, it would not, I think, be safe to estimate the earnings of these lines, at more than half of the amount guaranteed, and therefore the liability of the Government on this account may be taken as 237,098*l.* per annum. The various sums thus estimated as annually to be paid on account of guarantees on railways now working or in course of construction amount to a total of 349,529*l.* Finally, if the liability arising under the Concessions for the Angora-Cæsarea and Damascus-Biredjik Railways be taken into account, and if the same principle be followed of estimating the payments to be made by the Government at one-half of the guaranteed amount, the sum to be annually provided on the opening of these lines will be increased by 255,348*l.*, or to a grand total approximating 600,000*l.*

Influence of  
guarantees on  
traffic.

This heavy liability, to which must be added that for the railways in Europe, must be a matter of serious concern to the Ottoman Treasury, and the difficulties of the situation are increased by the peculiar influence of the system of guarantee, which is such as to give the Railway Companies a direct interest in discouraging traffic. In making up accounts with the Government, the amount of the gross receipts from traffic are deducted from the sum to be paid by the Government, whilst no compensating allowance is made for working expenses incurred for the purposes of that traffic; consequently, the greater the traffic the more money the Companies must expend, and the less they will receive from the Government. Such results are so manifestly unreasonable that it must be assumed that some change will be made, and that no further guarantees will be given under similar conditions.



In conclusion, I would draw attention to the influence of the introduction of railways in increasing revenue receipts, particularly as regards the tithes, and thereby, to a certain extent, compensating the Government for the heavy charges which it has accepted. The tithes of certain districts, which were assigned to meet the liabilities to the Railway Companies, are now administered by the Council of the Public Debt, and some idea of the effect of the railways on the revenues may be gathered from the accounts published by that institution. Table III shows the movement of the assigned tithes revenues during the years 1890, 1891, 1892, and 1893. The figures in this Table indicate a very striking and rapid progress in the districts opened up by the railways, but some of this improvement was probably due to a better system of collection, and not to the effect of the railways. The brilliant improvement noted, was also, to some extent, doubtless due to the prosperity induced by a purely temporary cause, namely, the arrival in the districts concerned of a large body of consumers who were employed on the railway works, and the finding of profitable employment for large numbers of the local population. The great hopes raised by the bright promise of the four years dealt with in the Table were, however, rudely checked by the miserable results of the tithes collection in 1894. The special portion of the tithes assigned for the guarantee to the Anatolian Railway Company, and which from £ T. 141,482 in 1889, had increased to £ T. 209,625 in 1893, fell in 1894 to £ T. 102,922. The very suddenness and completeness of the collapse proves, however, that it must have been, in great part, due to abnormal causes, and these abnormal causes are sufficiently apparent in the outbreak of cholera, the serious failure of the harvest in the districts concerned, and the extraordinarily rapid and disastrous fall in the price of agricultural produce, particularly cereals, on the value and production of which the tithes revenue chiefly depends. It may reasonably be hoped that such a combination of disasters will not occur again, and that normal circumstances may afford a fair chance for progressive development.

(Signed) E. FG. LAW.

Table I.  
SMYRNA-AIDIN RAILWAY.

ANNUAL Receipts.

Years.	Total Receipts.	Miles open.	Gross Earnings per Mile per Annum.	Percentage of Working Charges.	Net Earnings.
	£		£		£
1867 .. ..	41,410	80 $\frac{1}{2}$	513	103·17	Loss 4,959
1877 .. ..	93,634	83 $\frac{1}{2}$	1,125	55·49	Gain 37,338
1882 .. ..	134,258	147 $\frac{1}{2}$	910	51·30	„ 61,069
1884 .. ..	238,116	177 $\frac{1}{2}$	1,343	49·39	„ 115,969
1889 .. ..	257,570	193 $\frac{1}{2}$	1,333	43·55	„ 145,407
1890 .. ..	312,724	305 $\frac{1}{2}$	1,024	44·82	„ 172,555
1891 .. ..	262,932	305 $\frac{1}{2}$	861	47·31	„ 138,550
1892 .. ..	350,257	322 $\frac{1}{2}$	1,086	47·22	„ 184,865
1893 .. ..	354,406	322 $\frac{1}{2}$	1,099	45·56	„ 187,907
1894 .. ..	319,116	322 $\frac{1}{2}$	989	45·82	„ 167,877

Table II.  
OTTOMAN Asiatic Railways and Government Guarantees.

Railways Working, under Construction, or for which Concessions have been granted.	Length of Line in Miles.	Number of Miles completed.	Amount of Guarantee per Mile.	Maximum Government Annual Liability.	Estimated Annual Liability.	Payments made on account of Guarantees.		Remarks.
						1893.	1894.	
Beyrout-Damascus-Hauran	140	140	£ ..	£ ..	£ ..	£ ..	£ ..	
Haifa-Damascus-Hauran	218	..	..	..	..	..	..	
Jaffa-Jerusalem	52	52	..	..	..	..	..	
Mersina-Adana	41½	41½	..	..	..	..	..	
Smyrna-Aidin	318½	318½	..	..	..	..	..	
Smyrna-Cassaba	165½	165½	..	92,400	23,160	..	7,359	The guarantee is a fixed annuity, and not reckoned per kilometre.
Smyrna-Cassaba prolongation	154	..	1,196	184,276	92,138	..	..	
Anatolian Railway— Haider Pasha-Ismidt section	58	58	660	38,280	..	..	..	
Ismidt-Angora section	302	302	960	289,920	144,960	161,934	199,122	
Eskishehr-Koniakh branch	273	107	945	257,985	89,271	..	84	
Moudania-Broussa	26½	26½	..	225,000	112,500	..	..	The maximum liability is limited to 327½ per mile.
Damascus-Biredjik	280	..	800	225,000	..	..	..	The carrying out of this Concession is apparently postponed.
Angora-Cæsarea (Anatolian Railway prolongation)	256	..	1,116	285,696	142,848	..	..	Ditto.
Totals	2,285½	1,211½	..	1,378,557	604,877	161,934	206,565	

Table III.

## MOVEMENT of Tithes Revenue assigned to Public Debt Administration.

	Year.	Value of Tithes.	Increase or Decrease.	Percentage of Variation.
		£ T.	£ T.	Per cent.
In districts affected by rail-ways .. .. .	1890	171,737	..	..
	1891	246,172	+ 74,435	43·3
	1892	269,746	+ 98,009	57·0
	1893	292,738	+121,001	70·4
In districts not affected by railways .. .. .	1890	84,620	..	..
	1891	85,637	+ 1,017	1·2
	1892	83,216	- 1,404	1·6
	1893	94,367	+ 9,747	11·5

N.B.—The above figures refer to tithes collected in the Vilayets of Angora, Ismidt, Broussa, and Mitylene.

Table IV.

## TITHES collected by Public Debt Administration for Railway Guarantees (1894).

Amounts encashed for account of—	£	Amounts paid to—	£
Anatolian Railway .. .. .	93,565	Anatolian Railway .. .. .	199,122
Salonica-Monastir Railway .. .. .	111,155	Salonica-Monastir Railway .. .. .	52,449
Eskishehr-Koniah Railway .. .. .	8,036	Eskishehr-Koniah Railway .. .. .	84*
Salonica-Constantinople Railway .. .. .	27,275	Salonica-Constantinople Railway .. .. .	11,768
Cassaba-Alachehir prolongation .. .. .	20,793	Cassaba-Alachehir prolongation .. .. .	7,359*
Total .. .. .	260,824	Total .. .. .	270,782

N.B.—The difference between the amounts encashed and the amounts paid was provided by a special payment from the Treasury.

\* Part of a year.

Table V.

## OTTOMAN Asiatic Railways Rolling-Stock.

Railways.	Tender Engines.	Tank Engines.	Passenger Coaches.*	Goods Waggon, Trucks, &c.
Smyrna-Aidin Railway .. .. .	33	18	130	1,155
Smyrna-Cassaba Railway .. .. .	17	5	108	468
Anatolian Railway .. .. .	25	8	182	719
Mersina-Adana Railway .. .. .	6†	..	(?)	104
Moudania-Broussa Railway† .. .. .	..	..	..	..
Jaffa-Jerusalem Railway† .. .. .	..	..	..	..
Beyrout-Damascus Railway .. .. .	12‡	..	16	77
Damascus-Hauran Railway .. .. .	8‡	..	28§	68

\* Including post, break, and baggage vans.

† No data.

‡ Not classified as to whether tank or tender engines.

§ 8 goods waggon used for third class passengers.

Report by Major Law on Railways in Asiatic Turkey.

Table III  
 Movement of Public Revenues assigned to Public Debt Administration

Year.	Value of Public Revenues assigned to Public Debt Administration.	Percentage of Total Public Revenues.
1890	171,737	3.7
1891	248,173	4.3
1892	302,743	5.0
1893	302,733	5.0
1894	34,830	0.6
1895	38,000	0.6
1896	38,000	0.6

Presented to both Houses of Parliament by Command of Her Majesty, May 1896.

LONDON: PRINTED BY HARRISON AND SONS.

Table IV  
 Public Revenues collected by the Debt Administration (1891)

Year.	Value of Public Revenues collected by the Debt Administration.	Percentage of Total Public Revenues.
1891	111,150	1.9
1892	8,300	0.1
1893	27,275	0.4
1894	20,750	0.3
1895	20,750	0.3
1896	20,750	0.3
Total	200,825	3.3

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Table V  
 Ottoman Asiatic Railways Rolling-Stock.

Railways.	Locomotive Engines.	Tender Engines.	Passenger Coaches.	Goods Waggon Trucks, no.
Damascus-Hama Railway	10	10	232	88
Hatay-Damascus Railway	10	10	10	77
Lebanon-Hama Railway	10	10	10	10
Mosul-Hama Railway	10	10	10	10
Marash-Hama Railway	10	10	10	10
Antioch Railway	10	10	10	10
Savara-Osmanli Railway	17	17	103	406
Savara-Antioch Railway	31	31	130	1,156

\* Including four passenger and baggage vans.  
 † No data.  
 ‡ Not classified as to whether they are passenger or goods waggon.  
 § Goods waggon used for third class passenger.



# WESTERN ASIA MINOR. RAILWAYS CONSTRUCTED AND PROJECTED.

Scale -  $\frac{1}{2,500,000}$  or 1 inch = 42 Miles.  
10 5 0 10 20 30 40 50 60 70 80 Eng. Stat. Miles

A  
R  
C  
H  
I  
P  
E  
L  
A  
G  
O

B  
L  
A  
C  
K  
S  
E  
A

CONSTANTINOPLE

MARMORA SEA

Ala Dagh

Salt Desert

Gulf of Adalia

REFERENCE.

- SMYRNA AIDIN RAILWAY.
- SMYRNA KASSABA.
- ANATOLIAN.

(1400. 5/96. 1344) F. O. 390

Harrison & Sons Lith. St. Martin's Lane, W.C.



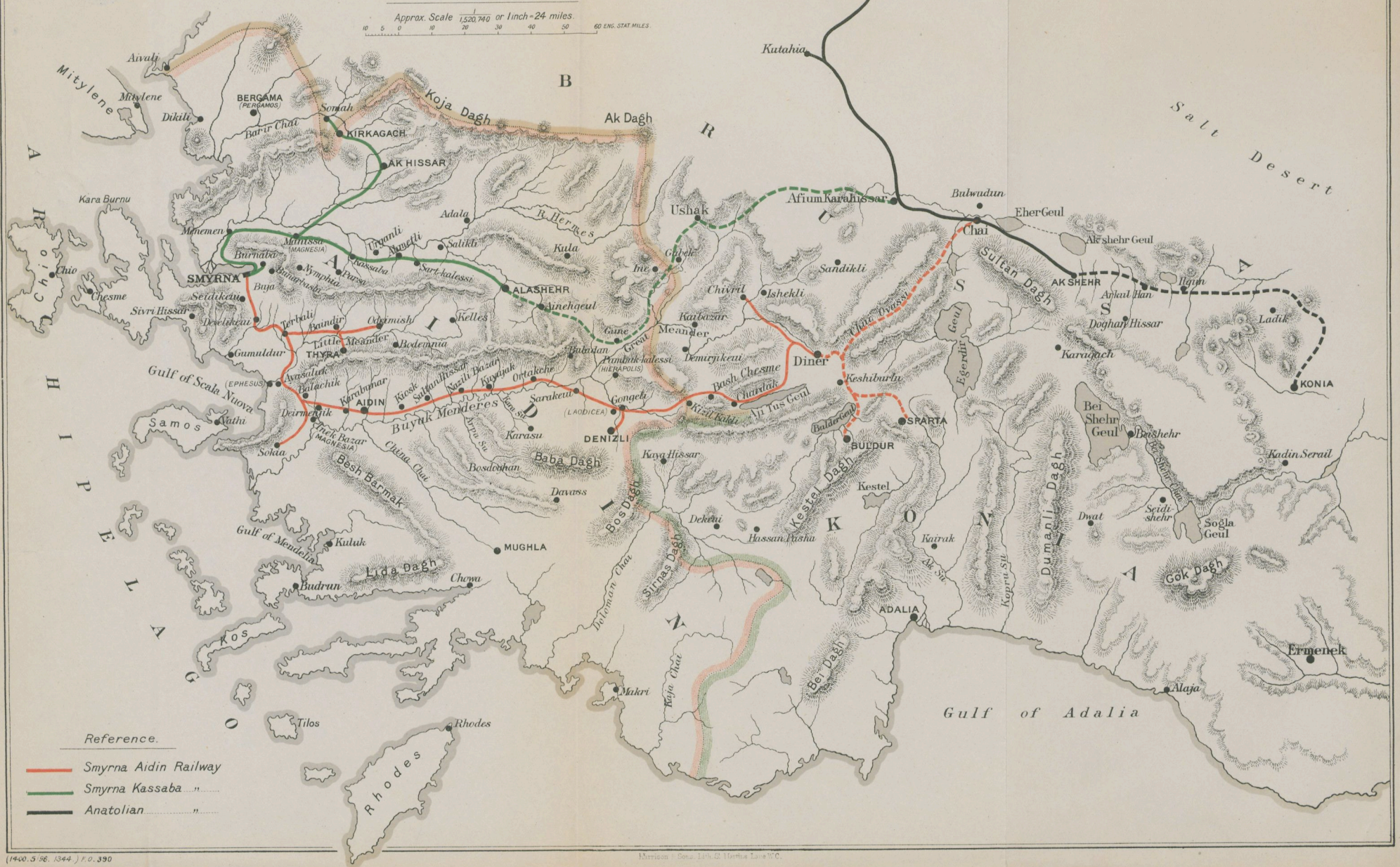
Zu Scjn. 048235



# PART OF S.W. ASIA MINOR

SHOWING  
Railways constructed & in course of construction  
SEPTEMBER 1895.

Approx. Scale 1:520,740 or 1 inch = 24 miles.  
10 5 0 10 20 30 40 50 60 ENG. STAT. MILES.



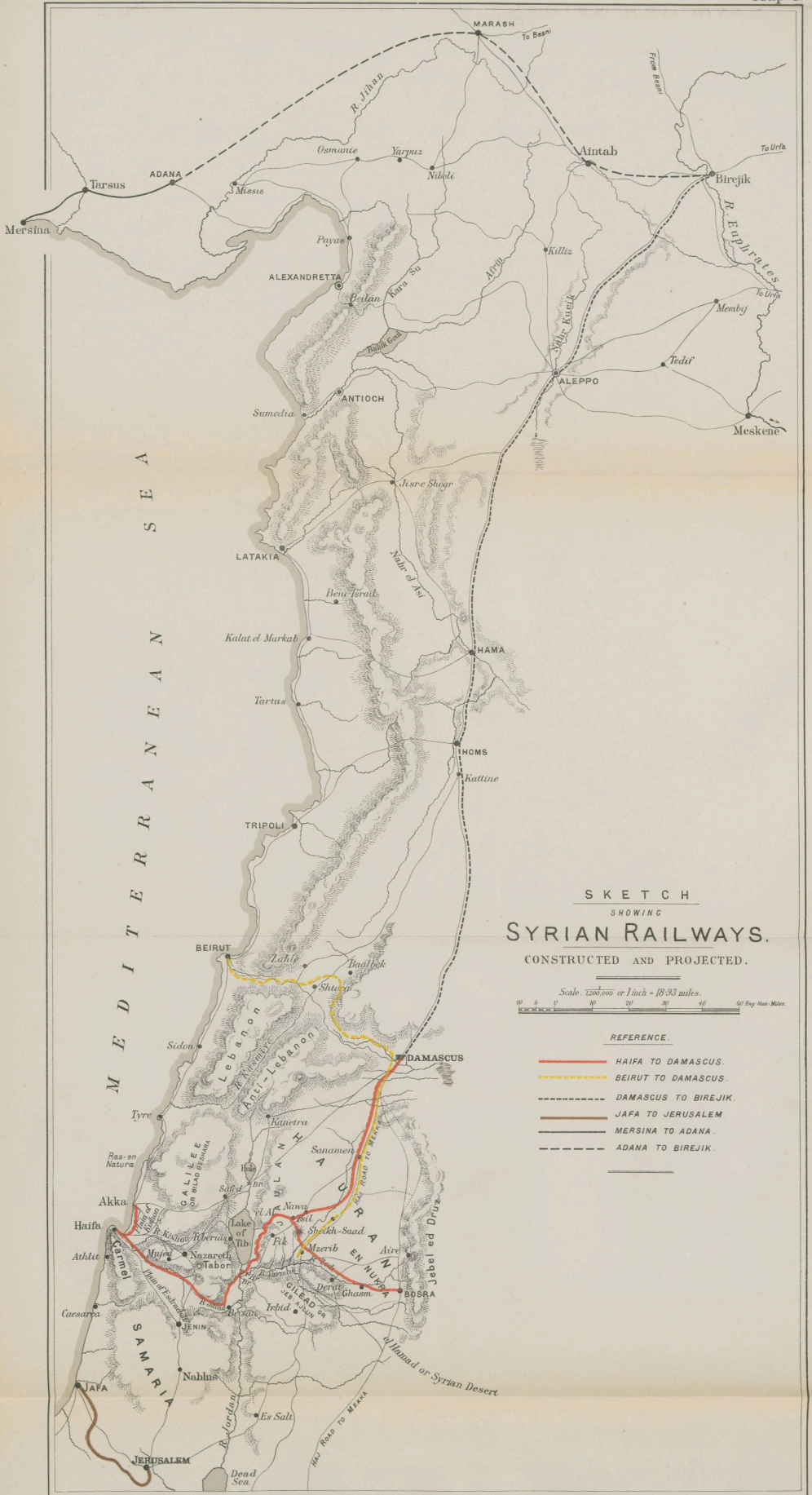
Reference.

- Smyrna Aidin Railway
- Smyrna Kassaba " " " "
- Anatolian " " " "



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Revised 1898. Lith. by Morris Lane & Co.



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# SYRIAN RAILWAYS

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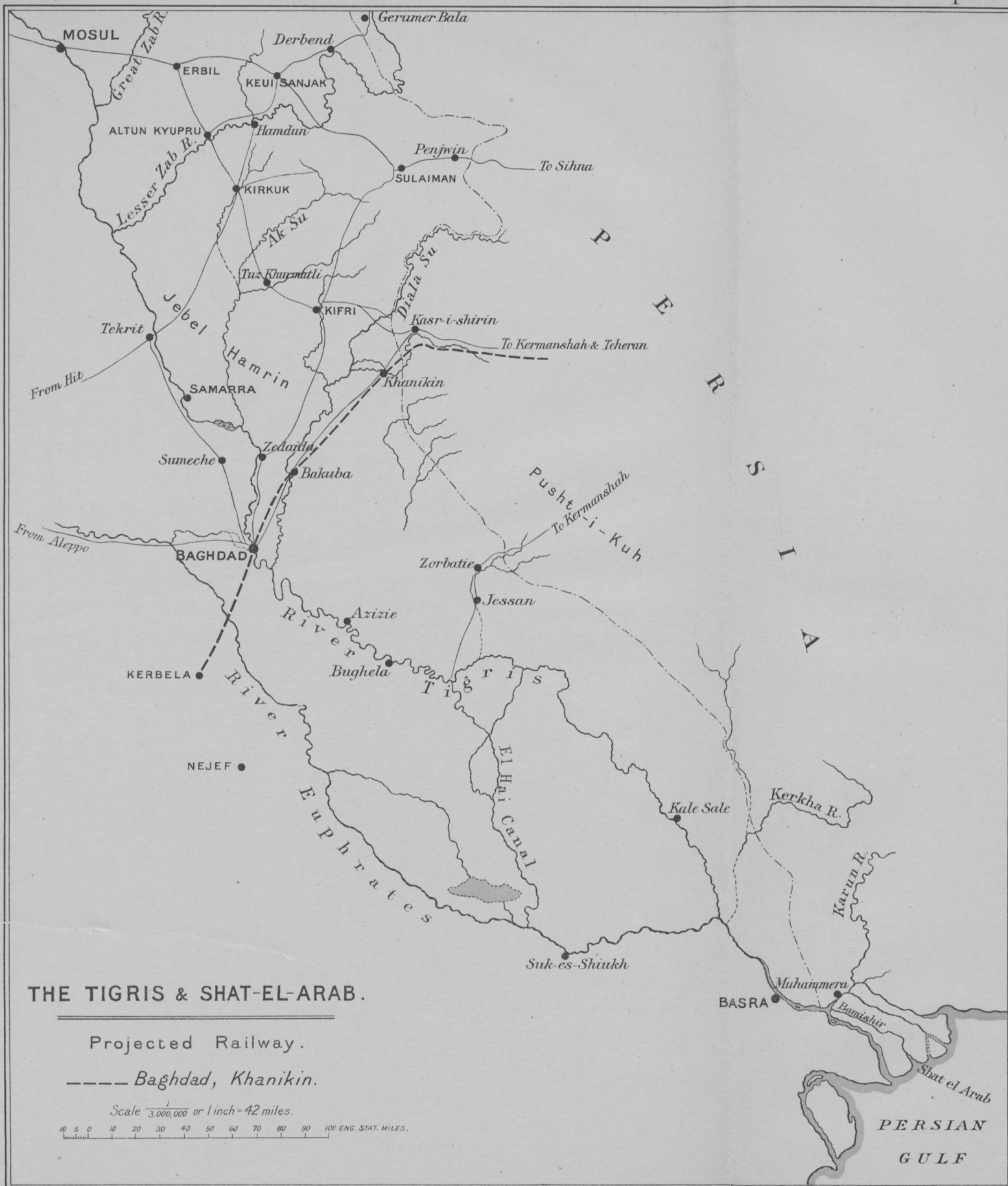
SYRIAN RAILWAYS

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SYRIAN RAILWAYS



(1400.5/96. 1344) F.O. 390.

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ZUSJH. 04SB 235





**EASTERN ASIA MINOR**  
**RAILWAYS**  
**CONSTRUCTED & PROJECTED.**





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