# IN THE OASES.

TRAVELS THROUGH THE GARDEN SPOTS OF THE DESERT OF SAHARA.

A Look at Tarla on the Sousfane River—The Great Oases Republic of Tuat and How it Is Ruled—Something About Tafilet and its Warlike Inhabitants Who Invade Algeria on Camels—The Fertility of the Desert—Its Big Date Crop—Something about the Railroads Which Cross it and How They are Affecting the Caravan Trade—Striking Innovations Made by the French Upon the Greatest Desert on Earth.

*(Special Correspondence of the Deseret News by Frank G. Carpenter.)*

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COLOMB-BECHAR, Desert of Sahara.—Few people appreciate the extent of the fertile spots of the Desert of Sahara. The French have been exploring their territories in these sandy wastes. They are mapping them and are making a kind of a census of their population. They are now policing a great part of the desert and, for the first time, travel in the central Sahara is comparatively safe.

This is not so in the western part of the desert where I now am. I can go nowhere unless accompanied by soldiers, and many of the oases about here are now fearing an invasion from the Tafilet brigands who live across the mountains in Morocco. Only a day or so ago a camel caravan coming north into the French Sahara from the Soudan was robbed not far from Lake Chad, many of its people were killed and the French soldiers tell me that they apprehend trouble here in the near future.

### THE OASES OF THE SAHARA.

But I want to tell you something about the oases of this mighty desert. I have visited a number of them, and through conversation with explorers and travelers of this part of the world I have learned much about others. The oases are scattered at wide distances apart throughout the Sahara. Often there will be none for miles and miles, and again they will pepper the rocky wastes as though the Lord had sown patches of green from out the sky. It is estimated that there are altogether something like 80,000 square miles of such garden spots scattered here and there upon this ocean of sand.

Eighty thousand square miles!

That means a territory twice as large as the state of Ohio, and one infinitely richer. Suppose that you could pick out of our country enough of its richest hot beds to cover Virginia and Kentucky, and patch them together. That will give you some idea of the extent of the oases. To appreciate them, however, you must imagine them lying in the midst of a region larger than the United States the rest of which is absolutely sterile. You must have them surrounded by sand rocks, boulders and all sorts of arid formations. You must have no green of any kind for miles about but a vast waste of blazing white, dazzling yellow or eye-aching red. Off in the distance the mountains may be blue and may change to a warm rose tint at the time of the setting sun, but elsewhere all is arid and bare.

### DESERT ISLANDS.

Sometimes the oases will form a string or rather a chain of green islands marking the route of some dry gulf stream flowing through the ocean of sand. At others, there may be many in one place showing the site of a subterranean lake, or of springs or wells far off from any other apparent water supply.

The desert has been described as a vast ocean, and the oases as its islands. These Sahara islands, however, lie below rather than above, the level of their sandy sea. They are always found in depressions where the scanty waters have drained in and formed reservoirs.

Much of the desert has a bed of stiff clay under it. The water may sink down through a hundred or more feet of gravel and rock, but when it comes to this clay bed it flows on until it strikes a hollow and if this hollow be high enough and deep enough the result is an oasis. In the district known as El Erg depressions of this kind furnish wells which can irrigate 8,000,000 of date palms, and where I am now is the Wady Saoora, a great underground stream which flows far below the surface for several hundred miles and then rises and supplies the oases of Tuat, which are among the largest of the western Sahara.

### THE RIVER OASES OF TARLA.

I have already described the extensive date planations of Figuig, lying northeast of here near Beni Ounif, in Morocco, on the other side of the mountains. They are watered by hot springs, some of which have a temperature above 100 degrees Fahrenheit. Those springs come out of a plateau in the middle of the oases, and their waters are conducted by underground drains over a solid date forest, covering an area greater than that of 80 160-acre farms. I rode miles with my soldiers in going in and out among the plantations and I am told that their number is close to a million.

The oasis of Figuig is not at all like the oasis of Tarla, which I also visited during a 20-mile horseback ride over the desert from Beni Ounif. Tarla is one of many oases which spot here and there the branches of the Wady Saoora. It is found on the Sousfane river, which united with the Wady Gir near Igeli to form the Saoora, the latter flowing from there on southward and finally feeding the oases of Tuat. From here to Igeli, a distance of more than a hundred miles, the river flows so far below the surface that there is no vegetation whatever.

Just east of Figuig the Sousfane comes to the surface in a trickling stream, and the result is scattered oases covering a distance of several miles. These oases are so narrow in places that one could throw a stone over them. They are often not more than 100 feet wide, broadening out to 300 feet or more in some places. Even there the river bed is often dry, but little pools of water now and then come to the surface, and near them are date trees growing out of the dry sand, most of which are loaded with fruit.

At Tarla such palms run up and down the river bed for eight or 10 miles. I rode at least six miles through them and that under bunches of ripe dates all the way. I stopped near a mud village, which was inhabited not long ago, but which is now deserted except at times of harvest. Its people have moved across the desert to Figuig in order that they may be better protected from the brigands of the desert, although they still own and cultivate their little date farms and when the crop is ripe come back to their mud huts and and mud towers to watch them.

### THE VEGETATION OF SAHARA.

The Arabs say that if you will thrust a stick into the desert and water it you will soon have a tree. I can easily believe this to be so. The sands of the Sahara are wonderfully fertile, and if they could all be watered this would be the garden spot of the globe. As it is, the rainfall the whole region over does not average more than five inches per year. There are certain places on the highlands, however, which have occasional rains, and at certain seasons the water falls there for several day off and on. When this occurs vegetation springs up as though by magic. The ground is carpeted with grass and there are wild flowers of many kinds. The Arabs know of these regions and they go there with their flocks of sheep and goats to pasture, coming away when the grass disappears.

On my way to Tarla I rode through patches of thorn bushes scattered at wide distances apart. Such vegetation is found all along this part of the Sousfane, the moisture not being sufficient for anything else. There was a drove of camels feeding on the thorn bushes as I rode by and I stopped and made photographs of them. Nearer the dry river bed where the moisture was greater were thick bunches of alfa grass and other desert plants and flowers, and then came the region of date trees. The palms were of all sizes. Some were just sprouting and others were as high as my head. Others were so tall that their Arab owner had to climb them to cut off the bunches of dates, which always grow at the top.

### A VAST BED OF FERTILIZER.

The soil of the Sahara is not like that of any country where rain is common. Indeed, the lack of rain is one cause of its great fertility. Other lands are leached by the water, and the brooks and streams carry a great part of their potash and other fertilizing matter out to the sea. This is not so here. The rocks may disintegrate more slowly, but the weathering goes on all the same. There is no place where the changes of temperature are more sudden and marked. The sun is red hot during the day, but when it sets it becomes bitterly cold and blankets are by no means uncomfortable. I always carry an overcoat in my rides over the desert, for I find that I need it.

The changes are such that the rocks split and crumble under them. The desert winds are as strong as those of the sea, and when the sirocco blows the sand cuts one's face. It dashes the sharp grains against the rocks and grinds them down, without the action of water, so that all the rich fertilizing materials lie where they fall.

The oases will grow almost anything that is grown in California. They have luscious oranges, grapes, melons and olives, and also apples, peaches, pomegranates and pears. In the northern Sahara they produce great quantities of wheat, barley, millet and sorghum, and in the south tobacco and cotton. I see eggplants, onions, tomatoes and cucumbers for sale in the markets, together with peas, beans, turnips and carrots. The chief product, however, is dates.

### MILLIONS OF DATE PALMS.

The date palm thrives throughout the Sahara if it can only have water. It is like wheat in our country; the money crop of every oasis and the chief support of the people. Indeed, an oases is known, not by the number of its inhabitants, but by the number of date palms it contains, and its inhabitants are rich or poor according as the dates produced are good or indifferent. It is the date crop that loads the caravans, and it is the food of the people. The date is, in fact, the bread of the desert; in some places the people eat little else, and dates are fed to the camels and even to dogs. Such dates are not like those we have in America. They are a sort of dry date, which can be stored away and kept for years. The dates sent to the United States are of a soft variety, so full of juice that they are often drained before they are packed. Other dates might be called table dates. These are delicious when eaten fresh from the trees. We have them now every day at our dinner and served at breakfast with the coffee and rolls. They are a fat yellow date, as sweet as sugar and as plump as an olive before it is pressed.

### THE OASES OF TUAT.

Among the oases fed by dried rivers those of Tuat produce about the best dates, although their product is not so good as the dates of Tafilet, which lies at some distance from here in Morocco.

Tuat is now controlled by the French. It has Tuaregs on camels, under the employ of the Algerian government, patrolling it to keep order, and its people have become peaceful and thriving.

Tuat is not one oasis only. It is composed of five large groups of oases in the very center of the Sahara, comprising 200 or 400 petty states. It is scattered over a region as big as Indiana, and it has altogether a population of 120,000 Arabs, Berbes and blacks. The people of Tuat govern themselves much as do those of Figuig. Each oasis has its own officers, and altogether they are a set of little republics with a united council over the whole, and all subject to the control of the French.

Tuat produces opium, tobacco and cotton and some wheat and barley. A large part of its date crop is brought by caravans up the valley of the Saoora by way of Igell to the railroad at this point and shipped from here northward to Oran and thence to Europe.

These oases are a great center of the caravan trade. They lie about 800 miles from Timbuktu in the Soudan and a like distance from Mogador on the Atlantic, from Tangier opposite the Strait of Gibraltar, and from Tripoli on the Mediterranean. The French are now trying to divert the Tripoli caravan trade to their Tunisian port of Gabes, the route to which is much shorter.

### A GREAT MOROCCO OASIS.

About the best dates known to the world come from Tafilet, situated west of here in Morocco. They are very large and sweet and they are shipped in great quantities to Europe as tid bits for the holiday season. Tafilet, like Tuat, comprises a number of separate oases, having altogether 300 fortified villages. Its chief town is Abuam, which has the largest market of the western Sahara. It is a great caravan center and it sends two immense caravans every year to Timbuktu, which lies almost 1,900 miles directly south of it. In the past there was considerable trade between Tafilet and Figuig, the dates coming there and then going on to the north, but this has now been diverted to Beni Ounif and Colomb Bechar to take advantage of the cheaper railroad rates.

The people of Tafilet are independent and warlike; they are fanatical Mohammedans and they are now causing no end of trouble to the sultan of Morocco. The governor of the oasis is said to be preaching a holy war and to be organizing raids to cross over into Algeria and assault the French. The Algerian papers are full of the schemes of these war preparations and the troops here are preparing to give them a hot reception. A caravan was attacked by Tafilet brigands a few days ago and an invasion seems imminent. Sooner or later the French will have to take possession of Tafilet or the powers of Europe will have to control its people. It has with its surroundings a population of more than a million and its people are about the worst in Morocco. The family of the sultan comes from that region and the Tafiletites have a great influence over all parts of Morocco.

The oases there are due to several causes. I understand they have both springs and wells, and that the southern portions of the country are watered by underground rivers, fed by the inner slopes of the Atlas.

This town of Colomb-Bechar is at the end of the railroad, and caravans from all this part of the Sahara bring their goods here to be shipped north. I understand that the railroad is paying and that notwithstanding it was built as a military necessity. About three years ago a plan was proposed to push the line on to Timbuktu, a distance of 1,600 or 1,200 miles further. If this is done, the French will have a railroad clear across the Sahara, and much of the trade which now goes on camels to Tripoli and to the Atlantic will be carried over this road. The road is a narrow gage, but it is well built and it carries considerable freight. The trains are slow, but they are infinitely superior to camels, which make only two or three miles an hour and with which 15 or 20 miles is a day's journey. As it is now a great deal of the caravan trade of the Sahara has been diverted to the Atlantic. The products of the western Soudan are carried up the Nigar to Timbuktu and Jenne, and thence sent overland to the railroad which the French have built from the port of St. Louis on the Atlantic to Kayes on the Senegal river. That whole region is now controlled by the French and there are French soldiers stationed in Timbuktu. The southern part of the Sahara is policed from that region and the chief imports come from Europe via the Atlantic ocean instead of across country on camels.

There is another scheme to extend the Biskra road which runs down into the Algerian Sahara from Constantine not far from Tunisia and in time we may cross the Sahara by rail.

### SURVEYING THE SAHARA.

The French are rapidly prospecting the desert. They have already laid out the rout for a telegraph line from Algiers to Timbuktu and Lake Chad. It will be 2,500 miles long. Their civil engineers have also gone over the desert from here to Timbuktu and they report that the chief difficulty in running a railroad between the two points will be the question of fuel. The coal which is now used on this line is briquettes made of coal dust, each being the size of an ordinary building brick, and the expense of transportation is such that at Colmob-Bechar good coal costs about $20 a ton. This cost will be increased as the railroad goes farther south. At this writing the engineers have discovered no coal along the route, and I am told that they will not continue the road unless some cheaper fuel can be invented. If Thomas Edison should discover, as he has been trying to do for many years, a way of getting the full energy of the coal without turning it into steam, that may solve the problem. As it is now, fully 90 per cent of the heat energy is lost, so that such an invention would make coal ten times as cheap as it is now. This would make a transsaharan railroad a possibility.

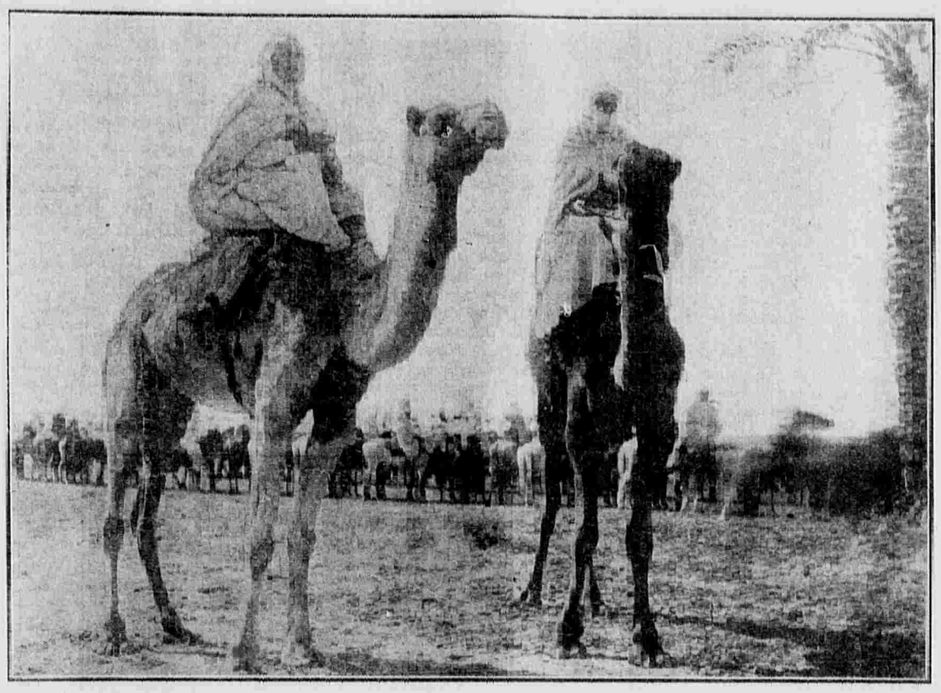
The caravans which bring goods here from the oases are as clumsy a means of transportation as can be imagined. Each freight camel on a long journey carries about 300 pounds, and the usual rate of travel is not more than two miles an hour. Every dozen camels has to have a driver, and each caravan is equipped with water bottles of pig skins and provisions for the people on the journey. The ordinary caravan has only a hundred or so camels and some from 30 to 60, while the larger ones will have as many as 500 and several hundred men to guard them. In the past caravans of a thousand or more camels were not uncommon and there are some such caravans now on their way from the Soudan to Tripoli.

Many of these caravans stop for the camels to feed on the thorn bushes as they go over the desert. Others carry provisions for a part of the way. The routes are always along the lines of the oases, as a camel can only go from three to five days without water. On a long journey the beasts are kept from drinking for some time before starting in order that they may be thirsty and fill the great reservoirs inside them.

I find that there is a great difference in camels down here in the Sahara. There are some which go as easy as a gaited Kentuckey horse, and others which jar one more than a hard trotter. The meharis, or fast riding camels, can make 12 miles an hour right along; they seem to be all legs and have the speed of the winds. They are well cared for and are as beautiful as camels can be. There are usually some of these meharis with the larger caravans. They are ridden by soldiers or the chiefs of the tribes, armed with guns. Sometimes Tuaregs, so mounted, are employed as guards.

The freight camels on the other hand are scarred and dingy. They always look sullen and will bite at you as they pass. They groan, grumble and even shed tears every morning when the loads are put on, and they seem angry from daylight to dark. It takes two or three months for a caravan to cross the Sahara, whereas by railroad one could make the journey in three or four days. The caravan trade, I understand, is steadily falling off, and at present the chief long distance transportation is between the Soudan and Morocco and Tripoli.

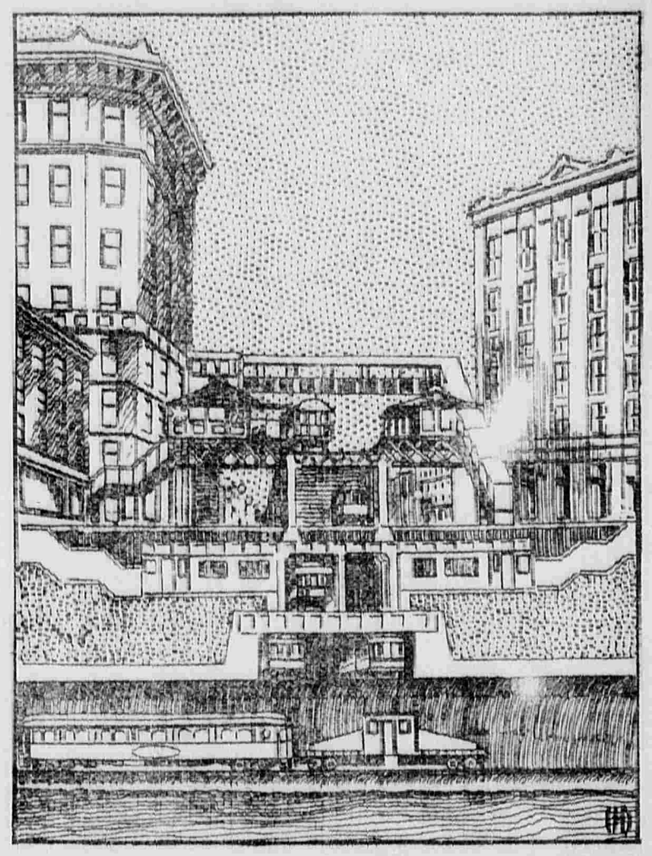
FRANK G. CARPENTER.



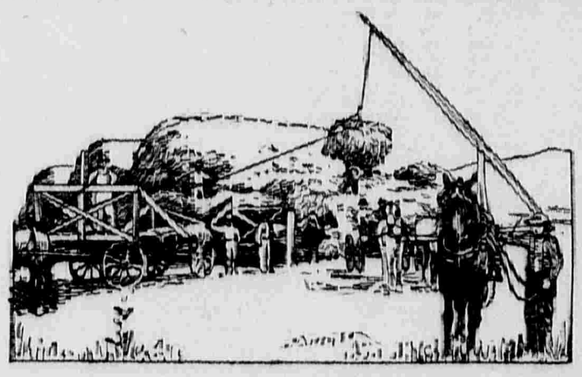
A SPEEDY PAIR OF MEHARI CAMELS.

These Beasts Are Racers and Were Photographed for the Deseret News by Frank G. Carpenter—They Will Make 12 or 15 Miles an Hour and More Than 100 Miles in a Day.

SECTION OF A FIVE DECKED STREET.



The cut illustrates the solution of a transportation problem that is certainly unique. It is a sectional view looking north at the junction of Sixth avenue and Thirty-second street, New York, and shows no less than five superimposed railroad systems—the Pennsylvania, the Rapid Transit Subway, the Hudson companies and the surface and elevated roads. This peculiar condition results from permitting five railroads to use one thoroughfare. It is probable that similar arrangements will be made in time at several congested centers in the business section of New York. There are already several instances in which three systems are accommodated after this fashion, and increasing transportation facilities will make it imperative.



This cut, made for Young & Winger, shows the Rigby Bros. putting up alfalfa on their farm, on the bench just outside of Teton canyon. There are three stacks finished, with a fourth well under way. These stacks are taken from 45 acres of ground, lucern and timothy, raised from the first crop. When the fourth stack was finished, they measured, after settling 60 days, 113 tons from one cutting. This yield is a fair averaeg of bench land production throughout the valley. The second crop, if properly handled, yields about half or two-thirds as much as the first.

The soil of these bench lands is usually of a heavy black loam, gently sloping towards the center of the valley. The pure, fresh mountain water that flows out over these benches would be an inspiring sight to the drouth-stricken regions of southern Utah. Alkali is unknown, and crop failures are absolutely unnecessary. In 15 years I have never seen a crop failure on this farm, when the crops were properly attendedto.

Besides large yields of hay and grain we raise apples, plums and cherries. Small fruit and vegetables are an assured success. We quote from an editorial in the Deseret News:

"At a recent visit to the Teton Valley, on the eastern bench, we saw gardens teeming with choice vegetables of great size, raspberries of excellent flavor, the bushes taller than most men, apples in profusion on thrifty trees, cucumbers ready for use, small fruits, rich and plenty, flowers in startling bright colors, and cows and calves were fat and fine, and the pure, bracing air seemed charged with life and force."

Also we have the best range left in th United States and always will have, protected as it is by the Government—in the interest of Bonifide settlers. Our flock-masters are getting rich without taking chances of anxious loss, for these reasons: They live near the range, feed good hay in the winter seasons, cattle and sheep grow larger, sheep clip nearly enough wool extra to pay for the hay they eat.

Altogether conditions are most favorable to the stock grower. Any young man who is willing to work may, by the investment of a small amount of money, become independent in a few years. Land and water sells from $10 to $25 per acre.

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