

Antolagasta, though h

The Nitrate Deserts of Chili iu Which Millions Are Invested.

METHODS OF MINING, COST AND PROFITS

Extent of the Deposits from Which the Republic Gets Half Its Revenue-A Borax Lake in the Andcan Highlands,

of tons of nitrate of soda, and it is esti-(Copyrighted, 1898, by Frank G. Carpenter.) mated that more than 1,200,000 tons of IQUIQUE, Chili, July 1 .-- (Special correnitrate will be shipped from them this year. spondence of The Bee.)-For the last three The value of these nitrate deposits runs high weeks I have been traveling through a vast into the millions of dollars. When they chemical laboratory of the gods. I have were in the hands of the Peruvians they ridden over miles of plains covered with salt. were rich, and now that they belong to have visited lakes of the whitest borax, have wound in and out among mountains rich in Chill as a result of its war with Peru, it gets more than half its revenue from the tin, copper and silver, and now write almost export duty which it collects from them. in the midst of the vast nitrate fields of The working of the fields is in the hands Chili like unto which there is nothing on the face of the earth.

of foreigners, and more than \$100,000,000 Leaving the silver mining town of Oruro, worth of English capital is invested in the great oficinas or factories by means of which Bolivia, I came down the mountains on the little narrow gauge which connects that the nitrate is taken from the earth and town with the seaport of Antofagasta. The prepared for the markets of the world. Vast fortunes have been made out of these nitrate distance is 600 miles, or about as great as that between New York and Cleveland. The fields. I met in England some years ago the track is only two feet six inches wide, and late Colonel North, the nitrate king, and the road is. I believe, the longest one of visited him at his magnificent country place this gauge in the world. The cars are of at Eltham, near London. He lived there like the American style, having been built in a prince and was at the time fairly rolling Massachusetts. The scats on one side of in wealth. All of his money was made in the car are not wider than a kitchen chair this region, and the champagne which we and on the other, where they are supposed had at dinner, though its taste showed no to hold two, not more than thirty inches. evidence of the fact, was effervescent with It was, in fact, more like riding in a toy nitrate of soda. The nitrate which the car than on the through trunk line which United States imported from this Iquique forms the only rail connection between two district alone in 1897 cost more than \$3,great countries. Still the road is smooth 000,000 in gold and the smount was more and well laid. Its ties are of Oregon pine than 234,000,000 pounds. The greater part of and the stations upon it are as a rule built this has gone into the making of powder and of corrugated iron from Europe. The fares high explosives, and much of it has already are exceedingly high. I paid 51 silver dol- been used in the war with Spain. Another lars for my ticket, and in addition \$36 extra part of it has been sold as fertilizers, and baggage, as nothing whatever is allowed is now enriching the soil of American free. My meals at the dining stations each farms. It is as a fertilizer that the chief cost me \$1.50 in silver, and when I stopped demand for the nitrate comes, the bulk of at night, as I was forced to do twice on the the product going to Germany, where it is road, the hotel rates were \$4 per day. The used in the growing of the sugar beet. chief purpose of the road is to carry the Just now, however, the nitrate business is silver and other metals to the seacoast. The not as prosperous as it has been. A nummost of the cars of our train were loaded ber of the factories are idle, and the markets with little chunks of silver ore, and we are overstocked. In the Nitrate Fields. passed train loads of tin on its way to the

£90,000 sterling.

A Desert Paved With Gold.

Chili for a distance of more than 300 miles,

and their product is so valuable that they

almost pave the desert of Chili with gold.

They have produced millions upon millions

Pacific. The Salt Plains of Bolivia.

It was a ride through a desert. Shortly after leaving Oruro we entered the salt plains of Bolivia. These are of vast extent lining the road for hundreds of miles. In fact there are but few places between fields of the world. Oruro and the sea where the ground is not more or less mixed with salt, and in some districts it covers the land like a sheet of dirty white snow. Along some parts of the line it looks hard and icy and you feel like jumping off the cars for a skate. At others it lies in gullies and again it only sprinkles the ground and a ragged growth of scrubby vegetation struggles up through it. The road runs for nearly the whole of its length through a desert valley, and this salt ries. reaches away on each side to the hills. Here and there along the road are lakes upon which seem to be floating great cakes lake has, it is estimated, more than 100,-

LABORATORY OF THE GODS all the world like the nnest of pure white tains and this sand and rock extend in-The stuff is borax of lime, and is not so land almost to the tops of the Andes. good, I am told, as the borax that comes Along the coast there is a low range of from similar lakes in California. Still it is foot hills rising in places to the height of of considerable value, for the lake has just a mile and more above the sea. Beyond been sold to a syndicate of Germans for this there is a rolling valley which runs

from north to south and on the other side of this valley the foot hills of the Andes begin. It is along the western edge of this This lake, however, is not a drop in the valley that the nitrate is found. In some ocean compared with the enormous value of the nitrate fields through which I crossed places it is not more than fifteen miles and in others as far as ninety miles from the as I neared the Pacific. These fields extend north and south through this part of

sea, but the deposits all lie along the western edge of the valley, forming a strip of an average width of about a mile and running irregularly, as I have said, from north to south for a distance of more than three hundred miles. In some places the deposit is four miles wide, and in others it plays out altogether and crops out some distance further on. In some fields the nitrate rock lies on the top of the ground. In others it is found from thirty to forty feet below the surface, with a strata of salt rock on top of it. The nitrate itself is seldom found pure in nature, though much of the rock contains from 40 to 60 per cent of nitrate. The Antofagasta rock does not contain more than 14 per cent of nitrate and other fields vary with the nature of the deposit. It is the getting the nitrate rock out of the earth and the extracting the pure nitrate salts from it that constitutes the immense industry of the pampas or nitrate fields. As to where the nitrate comes from there are a number of theories. One is that the desert was once the bed of an inland sea and that the nitrate came from the decaying of the nitrogenous sea weed. Another theory is that the ammonia rising from the vast beds of guano on the islands off the coast was carried by the winds over the range of hills near the sea and there condensed, settled and united with other chemicals of the soil to form the deposits and still a third is that the electrical discharges of the Andes combine with the elements of the air to make nitric acid. This acid was carried down through the ages in the floods of the Andes and was leposited on these beds in the form of

the nitrate comes.

How Mitrate is Mined. We shall see how nitrate is mined by a

visit to the great pampa of Tamrugal. This pampa or field has sixty miles of oficinas and nitrate fields. A railroad has been built through it to carry the nitrate to the seacoast at Iquique and upon it has grown

and a second a second a second as a second as

up vast factories, towns of corrugated iron My first view of the nitrate fields was on huts, in which the tens of thousands of the railroad going to Antofagasta. The de- workmen employed in the business live and posits in that part of Chill, however, are the homes of well educated Europeans who

not so good as those further north and I live here and manage the properties. Leavhave taken ship and come to Iquique, which ing Iquique the railroad carries you up the is the chief shipping port of the best nitrate hills and brings you right into the nitrate I have traveled from fields. You are soon in a plain about here to some of the richest fields and have twenty miles wide with low hills rising upspent a day at the great nitrate oficina of ward on the right and the left. the Agua Santa company, which has a cap- side of this plain nearest the sea the earth fresh rock. ital of \$3,000,000 and which produces mil- looks as though it had been plowed up by lions of pounds of nitrate a month. But giants and it lies in mammoth clods of all

before I describe the method of getting this shapes and sizes. This is the nitrate product out of the earth let me show you fields which have been or are being worked. stone, the manager of the Agua Santa where these wonderful fields are. In the The rest of the land is bleak, bare sand. offcina, the man who is perhaps of all the first place the word fields is misleading. It There is no vegetation and no sign of life nitrate managers the best posted upon such conveys the idea of fences and fixed bounda- of any kind. All is sand, salt rock, and matters. I will only say that the greatest The nitrate fields are scattered over amid the clods nitrate rock which is called cars is taken to get every atom of nitrate the desert and their only boundaries are callche. It is a soluble rock of different out of the rock at the lowest possible cost, white posts at the corners of the different colors. In some places it is almost white and that I was again and again surprised properties. Outside of these there are no and looks like rock salt. In others it is at the careful study which has been taken of ice. The cakes are not ice, however. marks. There is not enough waste wood yellow and in others all shades of gray. to save every cent in product and labor in the whole desert to make a line fence lemon, violet and green. The strata of throughout the works. It was indeed a of Ascotan, Bolivia, there is enough borax about a city lot. There is not a blade of nitrate usually lies about two feet or more lesson in economy, and when I referred to to wash the heads of all humanity. This grass, and, with the exception of here and under the earth and there is often a sait it Mr. Humberstone said: "The nitrate there a scrubby tree, all is bare, gray deso- rock or conglomerate above it. The method profits of today are a question of small to the markets of the world. I saw it on a glint of white where the salt about a foot in diameter through the upper is a cent in the cost of a quintal. my left as 1 rode over the railroad on the rock has caught the rays of the sun. There crust and to extend it down for a few or 100 pounds, is an important item.

out and the fuse is lighted. An explosion is an element separate and spart from the as Iquique, is almost equally well favored follows. A great yellow cloud of smoke nitrate of soda and it forms another valuable and there are a half dozen other ports here and dust goes up into the air and the earth product of the nitrate fields. is broken up for a radius of about thirty precipitated in tanks by means of bisulphite business of making and shipping nitrate of feet about the hole. The nitrate rock is of soda, and is drawn off in the shape now dug off with picks and crowbars. It of a dirty black powder. The powder is

is broken into pieces of thirty pounds or less washed and filtered and is then put into and is loaded upon iron carts to be taken iron retorts and heated. It soon turns to to the factory. Each of these carts will hold three tons of rock and each is hauled by three mules, the driver sitting upon one of the animals.

crystals of a beautiful violet color. These are packed up and shipped to our country At the Factory. The caliche or nitrate rock is taken in these carts from the fields to the oficina or factory. This usually stands in the midst

have formed a trust which controls the of the fields. It is a collection of buildings product of the world and dictates just how with great smokestacks rising above them. much each factory may make every year. It contains thousands of dollars' worth of The price is now, I am told, S pence per costly machinery, vast tanks for boiling the ounc nitrate rock, crushers like those of a smelter What it Costs to Make Nitrate, to break it to pieces and settling vats in People who think that money is easily which the liquor containing the pure nitrate made in nitrate are much mistaken. The of soda is left until it has dropped its burbusiness requires large capital and the den of valuable salt. The nitrate rock of most careful management. The prices of nasal solemnity made it affective, was this: the Agua Santa fields as we saw it blasted nitrate lands have steadily risen of late out of the earth has only about 40 per cent years and today the only properties to be of nitrate of soda in it. The nitrate sent gotten outside of those in the hands of the to the markets is from 95 to 96 per cent seventy-nine factories which are now in expure and the rock must be so treated as to istence are from the Chilian government, bring about this result. This is done by which only sells at auctions, which are bolling the rock just so much and no more. periodically held. The last auction was held The crushers reduce the caliche to pieces in 1894, when 2,000 acres were appraised at rural folks. Her answers to the questions about two inches thick, and it is then taken \$3,500,000, and sold, I believe, for more than to the boiling tanks, which are situated in their appraisement. Another property was requested her to speak louder, though witha building perhaps fifty feet above the appraised at \$9,500,000 of our money. There ground. These tanks are each big enough is a limited demand for nitrate of soda and to form a bath tub for an elephant. They while it is believed that the amount in are twenty-four feet long, nine feet wide sight will last the world at the present rate to take off that huge bonnet of yours." and eight feet deep. In them there are coils for fifty years and more, the Chillan govof pipe into which steam is running, raisernment is anxious not to ruin the business ing the temperature of the fluid in the tank out of which it gets so great a revenue by to any desired point. The caliche is carthrowing more lands just now on the married in cars up an inclined railway and kets. Even after the land is bought it dumped into the tanks. Then water is adcosts an enormous amount to establish a mitted and is allowed to flow from tank to nitrate factory. Take that of Agua Santa. tank in such a way as to act to the best It has a capital of \$3,000,000 in gold, and advantage on the salts within. The nitrate it pays dividends of 10 per cent, or \$300,000 of soda will remain in solution at a lower year. The factory alone cost \$655,000 and temperature than other salts. This fact and in addition there has been put in a Westothers of a scientific nature are taken adinghouse electric plant at a cost of \$16,000 vantage of, everything being done with the nitrate of soda. None of these theories are more. It has buildings which cost \$212,000 greatest care, and the result is that when entirely satisfactory and as yet no one has and its water supply cost \$51,000. It is now the liquor is drawn off nearly all of the absolutely solved the problem as to whence employing 800 hands, who receive \$60,000

pure nitrate of soda in the rock goes with a month, and it supports about the works t. It flows from the boiling tanks into a colony of more than 3,000 souls. It owns afterward a member of the English bar, is other tanks, which lie in the open air at a a railroad to the seaport of Caleta Buena, lower level. It now looks for all the world which port also belongs to it, and from like pale maple molasses or thick lemon which it ships its nitrate. Like all of the syrup. In a short time it begins to crystalfactories, it has a large store connected lately reported an instance of his shrewdlize and the tank is half sugar, which is with the works and a great part of the really almost pure nitrate of soda. This is wages of the men are spent upon the ground. now shoveled into piles, whence it is bagged

up in sacks of 300 pounds each and hauled on the railroad to the seacoast to be shipped off to the United States or to Europe. A Lesson in Economy.

ments which the nitrate rock has built in a had accepted it to be warehoused at a stip-It has built numerous other facto- ulated rent. The warehouse, it was said. desert. rics, and it is now keeping tens of thousands was old and the walls and roof gave way, After the salts have settled in the tanks of men at work. All along the nitrate rail- in consequence of which the cotton was the liquor which lies on top still contains road there are towns containing houses of damaged. a large amount of nitrate. It is conveyed corrugated iron, with hotels and stores, and The defendant spared no expense in pro back to the boiling tanks and is loaded at the seacoast, which is, if anything, more curing witnesses of the class known as with ore nitrate by being flowed over the barren and desert-like than the nitrate fields "experts," upon whose evidence, rightly or I shall not describe the technical details of the process, which is citics, all of which depend entirely upon complicated in the extreme. They were exthese nitrate deposits. Take Iquique, for inplained to me by Mr. James T. Humberstance. It lies on the edge of the sea, right the box, with the full confidence of vast under the ragged hills which fringe the experience-architects, builders, engineers, coast. There is not a blade of grass about warehousemen and all who could assist in it, and not a drop of water, save that which demonstrating to the jury that no stronger is brought here in ships or in the iron pipe or more perfect warehouse had even been

ine, seventy-five miles long, with which it constructed. At last, by way of climax, came a gentlehas been connected with the springs of Pica, in the interior. Still, Iquique has 30,000 man whose great prestige and combined expeople, and, next to Valparaiso, it is the perience as both architect and engineer most thriving scaport in Chill. It has wide eclipsed that of all who had preceded him. streets, telephones and electric lights, and a He gave his evidence in that calm and street car line, with Chillan maidens as con- , measured tone which demands acquiescence ductors. It has newspapers, a theater and as from all who hear it and explained the imgood an English club as you will find along possibility of the accident having occurrethe west coast of South America. It has in consequence of any improper construct good stores and markets, and though it pro- tion or want of repair.

While this was going on Mr. Benjamin duces almost nothing but nitrate of soda, it way to the coast. It is about six miles are few more barren places in the world in the world in fact, mean to us a saving of at has everything from the outside, and you sat taking a note in solemn gravity square, and the borax in it lies in great than the Chilian desert. The coasts of the into this hole a boy is let down. He least \$1,200 a month." Mr. Humberstone can live as well here and have as great a rose to cross-examine the witness. "It hink sir, you salt taking a note in solemn gravity of eating as any place in South "It think sir, you salt you had has everything from the outside, and you sat taking a note in solemn gravity; then he masses, which, when taken out look for upper part of the country are as bleak as scoops out a pocket for the blasting powder also showed mo how the iodine of com- | variety of eating as any place in South] "I think, sir, you said you had great ex-

large "Yes."

It is in the desert which are nourished by the

improbable will happen."

affidavits usually be."

out much success.

move her bonnet."

there already."

seat with us on the bench."

ness and convincing logic:

been made by judges and others.

One after another these men came into

TOLD OUT OF COURT.

deed, it is always probable that something

signing, excused himself by asserting that

this was "the usual manner of administer-

ing oaths in such cases;" but he was not

A unique formula for swearing to an

affidavit adopted by a well known attorney

"I swear that this affidavit is as true as

Out in Indiana a good many years ago a

certain old woman, summoned as a witness,

came into court wearing a large poke bon-

net such as was then much affected by

put to her being rather indistinct, the court

"The court cannot hear a word you say,

but it has no right to make a woman re-

"Madam," replied the judge, "you seem

so well acquainted with the law that I

think you had better come up and take a

general of the southern confederacy and

said by his biographers to have had great

power in applying "the theory of law to

daily practice." The Fortnightly Review

of western New York, whose characteristic

able to convince the court of that fact.

soda.

vapor, which is conducted into pipes of fire-

clay, in which as it cools it changes into

and to Europe. The sale of iodine is a

monopoly in the hands of Anthony Gibbs

& Co. of London. The different companies

FRANK G. CARPENTER,

"And that you have carefully considered the causes which lead to their weakness?" "Certainly."

"And you have applied those considerations to the present case?" "I have done so."

"Then will you kindly answer me one more question? Why did that warehouse A Georgia judge is credited with saying in giving a formal judicial opinion: "In- fall?"

The witness paused, and Benjamin, with a pleasant twinkle in his eye, sat down with almost a bump on his seat.

The pause continued, and the effect of it An Oregon attorney who filed pretended was so striking that jurymen, bystanders affidavits to which he affixed his official and all could not resist a hearty laugh, jurat as notary public when the signers had which terribly diminished the effect of a never been sworn, but merely admitted the long and reasoned reply which the expert finally went on to give.

"Thank you," said Benjamin. "I have no more questions with which to trouble you." The result was irresistible, and no ingenuity on the part of the learned counsel for the defendant could retrieve the lost ground. The verdict was for the plaintiff.

RELIGIOUS.

Nincteen millions of the population of Austria, it is said, or 70 per cent, belong to the Roman Catholic or State church.

By way of laying up a few treasures on earth, possibly, Booth Tucker of the Salvation Army has purchased a \$30,000 house in New York City.

The report presented to the Congregational triennial council shows an increase in three years of 31,900 members in the Christian my good woman," said the judge. "Please Endeavor societies of that denomination.

Father Piscopo, the Italian priest who has begun a crusade against social evil in the Italian colony in New York, is not yet 30 "Sir," she said composedly, and distinctly enough this time, "the court has a perfect years of age. His life has been threatened right to bid a gentleman take off his hat, a dozen times.

It is stated that the American delegates at the World's Sunday School convention left the impression upon the English people that the Sunday schools in this country were far in advance of those of any other.

"I thank your honor kindly," she re-Gladstone once said: "There are, if may sponded, dropping a low courtesy to the be, 450,000,000 of professing Christians in the world. There is no longer one fold under court, "but there are old women enough one visible shepherd, and the majority Christians are content with its one shepherd in heaven. Judah Philip Benjamin, who was attorney

The Churchman publishes a supplement of twenty-eight pages, giving the contribu-tions of every Episcopal parish in the coun-try for foreign and domestic missions. There are said to be 659,268 communicants and 4,698 rectors. The total contributions were nearly \$13,000,000.

A colored preacher in Alabama sought admission into a jail to pray with the pris-He was counsel for a plaintiff who owned Cities in the Desert. This is only one of the great establish-against a Liverpool warehouseman, who jailer, whereupon the preacher immediately knelt down and prayed earnestly for the jailer. The latter was astonished and opened the jail at once to the evangelist.

The world certainly does move. Here is New Jersey parson declaring unequivocally that the man over whom he preached a funeral sermon had gone to the place pointed for the wicked. However, the subbarren and desert-like than the nitrate fields "experts," upon whose evidence, rightly or ject of the discourse was not a prominent themselves, there are a number of thriving wrongly, so many caustic remarks have citizen, but a poor creature who died as wretchedly as he had lived.

On a recent Sunday Rev. Robert Collyer preached in the Wesleyan chapel. London. A London journal, speaking of this, said: "Fifty years ago the now great American divine did the self-same thing, but there must have been a striking difference between that first sermon of his half a century ago and the one he deliver last Sunday Then Dr. Collyer was working at night. likley as a blacksmith; today he is known and appreciated the world over as a preacher, thinker and writer. His life is an excellent example for any man to copy, and success he has attained may be most truthfully attributed to the genius of hard work.'

The United Labor league of western ennsylvania has started a movement to nduce employers to change the general pay lay of all classes of working people Saturday to Monday, or some other day of tho week.