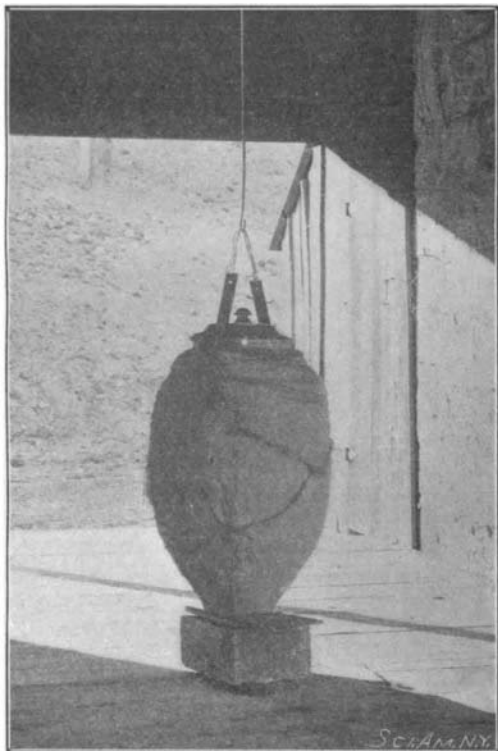


DEATH VALLEY, CALIFORNIA.

Death Valley is probably the most unique natural feature in California. It is located in the southeast corner of Inyo County, and is inclosed by the Panamint Mountains on the west and the Funeral Range on the east. It is seventy-five miles long, and at its narrowest point but eight miles wide.

At one time, most probably, it was the bed of an ancient river. The lowest depression is 200 feet below sea-level, but above this rises Telescope Peak, 11,000 feet high, of the Panamint Range, and directly oppo-



WATER COOLER USED IN DEATH VALLEY.

site the Funeral Peak, which reaches an altitude of 8,000 feet. During the winter these peaks are covered with snow.

This remarkable valley was discovered in 1850 by a party of immigrants, many of whom lost their lives in the attempt to cross it. The name has clung to it, also, as being the scene of numberless tragedies. Early in its history traditions of gold and silver deposits of wonderful richness within its boundaries persuaded many adventurous persons to undertake the hazardous experiment of its exploration. The number who have lost their lives in this desolate field is undoubtedly great. Pursuing the mirage of rich deposits of precious metals these adventurous prospectors succumbed at last to the intolerable heat and the agonies of thirst.

The range of the thermometer is probably greater in Death Valley than elsewhere in the Western Hemisphere. In winter the temperature is way below zero, while in July and August, the thermometer ranges for weeks at 137° above, frequently rising several degrees higher. For weeks at a time the lowest temperature observed exceeded 100°.

The deadly heat burns every vestige of vegetation. The Spanish bayonet, a plant that flourishes under the most arid conditions, here barely survives, while the mesquite, with its long roots penetrating deep into the earth in search of scanty moisture, just manages to exist.

A party of enterprising agriculturists once experimented with growing fruit and vegetables in this region, anticipating large profits in the early marketing of their crops. The attempt was a complete failure, the intense heat withering the plants, notwithstanding copious supplies of water and the most skillful cultivation. In the higher altitudes of the Panamints there are numerous valleys with flowing streams. In these, fruits are cultivated, and reach the market two months before the California products mature.

The prevailing winds in Death Valley are from the west. Though originating in the Pacific Ocean and

saturated with humidity in traveling the intermediate distance, they are intercepted by the lofty peaks of four ranges of mountains, which absorb all of their moisture, so that by the time they reach the valley all humidity has disappeared. The blasts are as if heated in a fiery furnace, and no living thing can survive the intense heat. Even birds, indigenous to the region, die.

It is in the months of greatest heat that the sand storms of Death Valley are most deadly. They rage with intense fury, obliterating the landscape and dimming the light of the sun, withering the scanty vegetation and covering the trails deep in powdered dust. At all times the aspect of the valley is superlatively desolate. No spot on earth surpasses it in aridity or tophet-like heat.

During the heated term an hour without water means death. Meat becomes putrid in an hour. Eggs are cooked in the blistering sand. Water is only palatable by means of large porous earthenware jars, common to all hot countries, suspended in drafts and reduced in temperature by means of the rapid evaporation of the moisture from the outside.

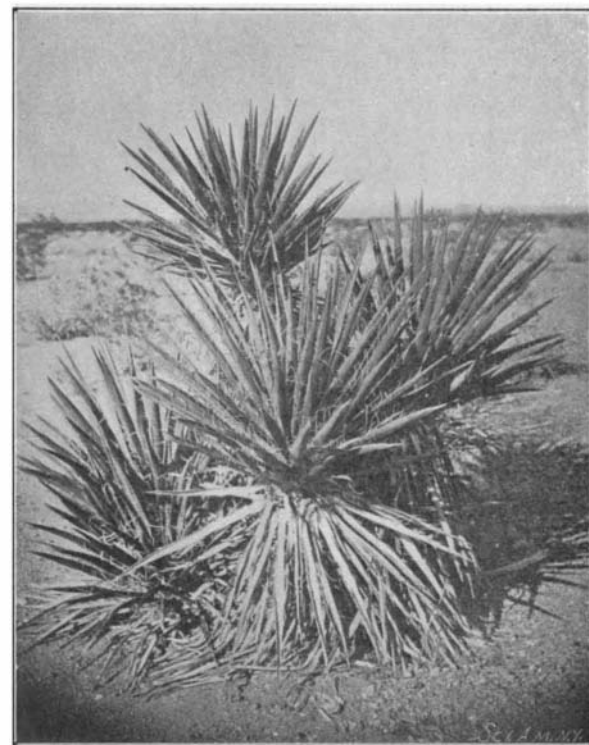
The belief that the borax marshes are the remains of the vast lake which once filled the valley is supported by traces of water-line found 600 feet above, on the mountain sides.

In general appearance all borax marshes are alike. They are located at the point of greatest depression and from a distance look like deposits of salt or snow. Under the surface is common wet clay or water of varying depths. These deposits are generally circular in form and appear as though once they were craters. Borax was created by contact of boracic acid in gaseous form, with the lime and soda of the surface. At Teels Marsh, Nevada, borate of lime appears in the form of balls imbedded in clay along with soda, salt, etc., but at Columbus these are found in sandy soil. Sometimes these balls are decomposed, underlying the soil which is removed, and the borate shoveled out. Deposits of crude borate of soda are found in Nevada and in Death Valley, at the Monte Blanco mines. The borax industry is so important that we shall have a special article upon the subject in the near future.

A New Substitute for Rubber.

An Italian residing in Mexico has recently devised a new composition intended as a substitute for caoutchouc in the manufacture of rubber goods. While residing in Mexico he observed a shrub growing in Central Mexico, and known to the Indians by a variety of names of which Yule is one. The shrub grows wild on the rolling land and attains the average height of three feet. An examination of the shrub led him to experiment with the same with reference to ascertaining what use might be made of it, since it grows abundantly, may be easily cultivated, roots readily from cuttings and may be cut two or three times a year and immediately begins to grow and shoots up again to form new wood. It does not belong to the plants which yield milky juices, being a comparatively hard wood and growing as a small scrubby bush, but there is found within its bark and wood a large amount of gummy matter and upon comminuting it by cutting finely, grinding, or pounding the same and macerating it with a hydrocarbon solvent such as gasoline, naphtha,

ether of petroleum, oil of turpentine, or the like, this gum is softened and extracted from the wood and when extracted does not harden to crystallization, but still holding a small portion of the hydrocarbon remains as a viscid, sticky mass that fulfills all of the physical conditions of crude rubber. It may be vulcanized perfectly and is superior to most india rubber since it is free from all mechanical impurities and needs no preliminary cracking, grinding and washing, as does the ordinary crude rubber. The botanical name of this shrub is *Syntherisma-Mexicana*, and it furnishes in gum the remarkable yield of 40 per cent of



SPANISH BAYONET PLANT IN DEATH VALLEY.

its own weight, while the method of extraction, and the admixture of a residual portion of the solvent gave as a new composition a brownish black viscid gum that it is not only free from all mechanical impurities, but may be brought by evaporation to any desired consistency, and is at once ready for use in the art without any preliminary washing and cleaning. It is abundant, cheap and may be treated either in a green state or in a dry state, so that it may be cut and baled and stored for any length of time and shipped without affecting its yield of gum.

In preparing the composition for the market, these shrubs are pounded with wooden hammers and placed in a large iron mill in order to comminute the shrub, and this is carried on as a continuous process. The product is then placed in an iron reservoir for maceration where it is kept hermetically sealed for twelve hours with hydrocarbon solvents. The receiver has at the center several iron or wooden beaters to stir the mass during its process of maceration so that absorption may take place homogeneously. This comminuted shrub then assumes a mucilaginous condition and the

receivers are put in a place heated to about 45° Centigrade. After standing until thoroughly soaked, it is taken out from the receiver, the mass being in the form of a mucilaginous pulp. It is then placed in bags of canvas, and these bags are closed in a hydraulic press. The gum that comes out falls into one or more tubes and are conducted to large receivers which contain reels to beat and stir the gum to dry out a part of the volatile solvent. In the place where these oils have volatilized there should be for the sake of economy a condensing apparatus to collect the vapors so as to use them again in dissolving other portions of the shrub. By this process the gum that comes out is chemically pure and suitable at once for manufacture, and it forms a new composition consisting of resin of the plant combined with a residual portion of the hydrocarbon solvent. This class of shrubs gives for a hundred pounds, forty pounds of gum, with a den-



MOUNTAINS ENCLOSING DEATH VALLEY.

sity at 15° C. of 0.980. This new composition has been termed "twentieth century gum," and among its advantages over ordinary rubber are first, saving in the cost of reproducing the plant; second, saving in the cost of exportation; third, saving in material used in purifying establishments; fourth, saving in fuel; fifth, in machinery; and sixth, saving in time.

Paris Exposition Notes.

It is estimated that 150,000 Americans will visit Paris sometime while the Exposition is open. These figures are said to be based upon the number of residents now abroad and the capacity of the transatlantic steamers. It seems very high, however, and probably 100,000 will be much nearer the mark.

The Experiment Station exhibit at the Paris Exposition is most interesting. The various agricultural colleges and experiment stations in the association have contributed materials, charts, pieces of apparatus, models, etc. The collections of photographs and publications is a most imposing one and the photographs are displayed in portfolios; there being 750 in all. Some of the apparatus is very interesting, such as electrical devices for determining the salt content, temperature, and moisture content in soils. The California Station furnished an olive exhibit including fifty samples of olive oil. The Alabama Station, on the other hand, presented a collection of mounted specimens of cotton. Several pieces of original apparatus for investigation in vegetable physiology are shown. The dairy exhibit is the largest. In 1889 our agricultural experiment stations also made an exhibit at Paris, but the exhibit was small and unimportant compared with the present one.

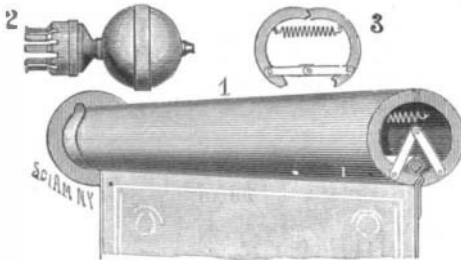
One of the interesting features of the Paris Exposition is the elevated moving sidewalk. This is modeled somewhat after that of Chicago, but the idea is carried out on a more extended scale; the line forms a complete circuit, running along the side of the Champ de Mars, the Quai d'Orsay, the Esplanade des Invalides, and the Avenue de la Motte-Picquet, the total length of its course being 3,500 meters. The platform is supported on an elevated structure, to which access is given from a number of stations located within the Exposition grounds. The substructure supports three platforms, one fixed and two movable, these having a speed of 8 and 4 kilometers per hour. This arrangement permits an easy passage from one to the other, and a more or less extended survey of the grounds may be made, a fine view being obtained from this elevated point. The tour is made in 26 or 52 minutes, and the fixed rate is 50 centimes. To enable the platform to pass around the curves, the different sections are dovetailed into each other by large circular portions, forming a kind of horizontal hinge. Each of the platforms carries an I-beam running along under the center; these rest upon a series of rollers placed at intervals, operated by electric motors. Upon the shaft of the motor is mounted a large roller for the high-speed platform and a roller of one-half the diameter for the slow speed. The friction of the platform is sufficient to cause its adhesion to the rollers. The platform was put into operation on April 14 and has proved a great success, as by its means an easy passage through the grounds is afforded, as well as a series of interesting views.

The great 25-ton crane which is mounted in one of the main dynamo rooms of the Paris Exposition presents many points of interest. It is of great height, being 20 meters from the ground to the highest point; it takes the form of an immense tower, formed of iron beams and braced by horizontal and oblique cross-pieces. It rolls upon a track laid along the whole length of the building, and is used to mount the large dynamos and engines of this section. The track is 6 meters wide, and is made up of two rails placed close together, leaving a space between the flanges, which is occupied by a series of short cross-pieces which constitute a rack. With this the pinion of the crane engages, the transmission being made by a stout shaft which leads from a motor placed midway up the crane. The middle space underneath the tower is large enough to afford a wide passageway, and the railroad track which has been laid to bring in the pieces of the machines passes under it, leaving still a considerable space. The tower supports a platform at the top, whose height is 12½ meters from the ground. On this is a circular crown of rollers arranged to carry the horizontal beam of the crane, which may thus take a circular motion around a pin in the center. Upon the center of this beam, which is constructed of trelliswork, are placed the motors, which separate the carriage by chains which pass over a series of pulleys. The length of the horizontal beam is 25 meters and the carriage mounted upon it will describe a radius of 11 meters. It will lift 25 tons to a height of 12½ meters. The rate of lifting is 0.04 meters per second, and the carriage travels at 0.20 meters per second; the crane is moved as a whole at the same rate. It rolls upon 8 wheels on each side. This crane has been constructed by Jules Leblanc, of Paris.

A NEW CURTAIN-HANGER.

The subject of the annexed illustration is an improved curtain pole, to which a portière or curtain may be attached without the use of the rings or pins ordinarily employed. Fig. 1 is a perspective view of the curtain-pole. Fig. 2 represents a socket employed when the pole is supported on brackets. Fig. 3 is an end view, showing the pole in position to receive a curtain. The pole has been patented by Almon S. Venen and Albert L. MacLeod, of Forest Grove, Ore.

The pole is formed of two hollow semi-cylindrical sections, hinged together at their upper ends to permit the lower ends to swing apart. Retractable springs



A NEW AND IMPROVED CURTAIN-HANGER.

serve to draw the two sections of the pole together. In order to hold the sections in distended position, toggle-links are employed, one of which is provided with a lug, which limits the downward movement of the toggles.

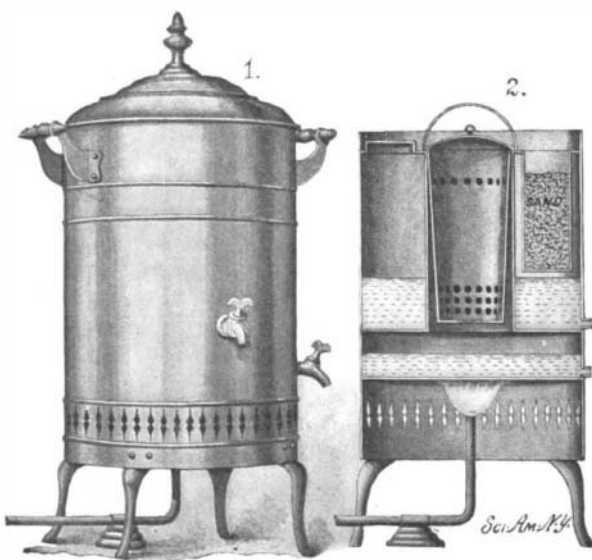
The upper end of the curtain is wrapped around a strip of wood and passed into the open pole. By forcing the links up, the retractile springs will draw the two sections of the pole together, as shown in Fig. 1.

When the pole is supported on brackets extended inward from the casing, the sections are held from accidental separation by means of a socket (Fig. 2) consisting of spring-fingers, to which an ornamental end piece is attached.

A STERILIZER FOR RAZORS AND SURGICAL INSTRUMENTS.

An apparatus for antiseptically cleaning the instruments used by barbers, dentists and surgeons, is of primary importance, for the reason that the germs in septic or infected tissues are but too easily transferred to healthy tissues by the very instruments which are used in maintaining that healthy condition. Undoubtedly the ideal sterilizing antiseptic is a moist vapor or liquid at boiling-temperature, which immediately acts upon bacteria without in any way injuring the instruments. A simple sterilizer built upon this principle has been devised by Dr. J. A. Cronkhite, of the J. A. Cronkhite Manufacturing Company, 405½ South Broadway, Los Angeles, Cal.

Dr. Cronkhite's sterilizer comprises a casing formed with a heating-chamber in its bottom. Above the heating-chamber is a tank which contains an antiseptic solution, the vapors of which pass upward into a central vapor-chamber which is surrounded by a water-chamber, and which is designed to receive a conical, removable instrument-cup. In order that the



THE CRONKHITE INSTRUMENT STERILIZER.

Instruments may be subjected to the action of the vapors given off by the heated antiseptic solution, the cup is provided with orifices in its sides.

Since it is often desirable to subject the instruments to the action of a sand bath, the inventor has arranged in the top of the water-chamber surrounding the vapor-chamber, a sand-vessel, into which the instruments are inserted to be mechanically cleaned before they are placed in the sterilizing receptacle.

In operation, the cover of the apparatus is removed, the sterilizing receptacle is filled with the instruments and hung in the vapor-chamber. The burners in the heating-chambers being ignited, the antiseptic solution is heated, and the hot, rising vapors sterilize the instruments, and also heat the water in the water-cham-

ber, and hence the sand in the sand-vessel. Hypodermic syringes and the like can be directly sterilized by withdrawing a small quantity of the heated antiseptic solution and using it in any suitable manner.

The water-chamber places at the dentist's command the supply of hot water which he finds so indispensable in his work.

Automobile News.

Coke will be used as a fuel for an English motor carriage.

A Chicago firm is using an automobile provided with a steel fender.

In the Paris-Roubaix race a serious accident occurred. Two competitors on motor tricycles collided and dashed into a crowd of two thousand persons. Twenty persons were knocked down, some of them having their bones broken and many others were bruised.

Two of the largest traction engines in the world and eight steel carriages, for use in the mining district of Siberia are reported to have been shipped from San Leandro, Cal. There has also been planned a carrying service across the desert in China in competition with the trade now done by means of camels, and it is expected to have 50 engines and 3,000 wagons actively engaged within a year.

A French military paper states that Col. Renard has invented a light motor for the purpose of traction on land and sea, says The Engineer. A grant was therefore made of \$4,000 in order to enable Col. Renard to adapt it for the traction of a military convoy by road. In this he has been successful, and in connection with it he has invented a stiff spiral coupling for the wagons by means of which as many as thirty wagons can be hauled by the motor, and yet be kept exactly in its wake, however winding the road may be. Col. Renard's invention will be tested at the army maneuvers this year on the plateau of Beauce.

The Russian Minister of War is desirous of purchasing a freight automobile to be propelled either by steam or kerosene, and if any manufacturer will ship two sets of carriages, one for steam and the other for kerosene, to St. Petersburg, the War Department will pay the freight and duty on both, and purchase the one best suited for its purpose, while the other one will be returned. The carriages must reach St. Petersburg by June, 1900. Full data as to weight, price, rapidity of movement, etc., should be sent to the Chief of the Staff of the Ministry of War. Owing to the fact that large orders may be given to supply the Russian army this matter is an important one.

The question of regulating the speed and circulation of automobiles has occupied the attention of the Paris authorities for some time past. The regulations which now exist have not given entire satisfaction, and the Minister of Public Works has decided to draw up a new set of rules, these to be established by a commission which has been appointed for the purpose, composed of experienced automobilists and engineers. The questions to be considered will be mainly those of speed, audible signals and the police measures to be taken relative to circulation, as well as the placing of certain distinctive marks, plates, etc., upon the vehicles. The commission includes Messrs. de Zuylen, president of the Automobile Club of France; Bailly, president of the Touring Club; Forestier, inspector general of routes; Pierre Giffard, etc. The commission has been well chosen, and out of its eleven members eight are members of the Automobile Club, and are experienced conductors.

A collection of military automobiles is to be shown at the Paris Exposition. The committee in charge of the section including the armament and material for the artillery has taken up the idea some time since, and from among the different vehicles used in the army a number of types have been chosen, to which this form of locomotion seemed to be best adapted. A number of constructors were called upon to furnish models of the different types, and a collection of twelve automobiles will be seen, of which two are operated by steam, one by petroleum, and nine by gasoline. These include a heavy tractor for use in artillery and engineering service, a medical wagon containing an equipment of surgical apparatus, medicines, etc., besides a folding tent for conducting operations. A telegraph wagon will contain a complete outfit of apparatus for field use, and another vehicle will be shown for transporting telegraphic materials. An automobile for the military postal service will also be seen. Among others are an omnibus for the transportation of personnel, a vehicle for the commanding officer, a rapid automobile and a smaller vehicle for the use of officers, a moto-cycle for the transmission of dispatches, etc. They have been built by a number of prominent constructors, such as Panhard & Levassor, the Société Scotte, Peugeot, De Dion, etc. The greater number of these automobiles will be painted a uniform gray color, which is that adopted for the army vehicles. The exhibit will be made in the Army and Marine Palace, fronting on the Seine near the Champ de Mars.