

THE GRAND SCENERY OF OREGON.

(Continued from first page.)

dered this district very rich in vegetation. The valleys of the many streams and rivers which abound in this section are most of them very fertile. The Rogue River, which has cut its way to the coast through a deep canon, is very beautiful and is very heavily timbered. A number of placer mines have been established along its shores, and much gold has been taken from the sand and gravels of its bed.

Our illustration gives a general view of Portland, which is the principal city of Oregon. It is located on the Willamette about 12 miles above its junction with the Columbia River. Its population in 1880 was 17,577, but it has grown rapidly under the impulse given it by the Northern Pacific Railroad. From its streets may be seen the beautiful cone-shaped glitter of Mt. Hood, which is the wonder and admiration of all travelers, and which rises from the vast plain to a height of 11,225 feet, solitary in its grandeur and standing like a sentinel watching over the destinies of the city. Its summit extends into the region of perpetual snow, and some idea of its beauty may be had from the photographs which we here reproduce.

Oklahoma the New Eden.

That innate and inbred desire of the members of the human family to get something for nothing—or next to nothing—must account for the mad race for quarter sections of land in Oklahoma, of which so much has been printed lately in our daily newspapers.

All the neighboring States of the Southwest, bordering on the newly opened territory, share in the excitement, and even the older States, like conservative Tennessee, are sending their contingents. Yes! Even the lake regions of the North are sending settlers. Among the excited throng are farmers, lumbermen, miners, mechanics, printers, store keepers, gamblers, saloon keepers, whisky men, and adventurers of every sort.

Already cities have actually been plotted on paper, and for one of them a bank has been organized which began business at noon on the now celebrated 22d day of April, 1889. The *Southern Lumberman* thinks that for some time to come it is altogether probable that *faro* banks in fair Oklahoma will considerably outnumber the legitimate financial institutions.

At the present time only one railroad runs through the new country, but several others go very near its boundaries, and these convenient thoroughfares are all putting on extra rolling stock on account of the unprecedented demand for transportation.

The General Land Office has established two offices—the one at Kingfisher Station and the other at Guthrie; while the Post Office department is straining every nerve in maintaining an effective postal service. There are said to be no fewer than seventy thousand applicants for the eleven thousand quarter sections of land that are available for settlement, so it is very evident that many pilgrims will be disappointed. There is no evidence to hand that Oklahoma lands are one whit better or richer in any respect than those in the Indian Territory, Kansas, Missouri, Illinois, or Tennessee, and yet hundreds of farmers are leaving comfortable homesteads in old settled communities and are gladly taking all the chances of pioneer life. Were there any indications of auriferous deposits of rich silver ore; of lead mines; of inexhaustible coal measures; of vast forests of hard woods; or in fact of any evidence of mineral or vegetable wealth out of the ordinary run, one could understand this mad rush; such not being the case, all our readers can do is to patiently await developments and then judge of the real value of Oklahoma and its lands. Land agents and law firms are circulating maps of the new Eden, and on paper it certainly looks to be a beautiful country; and *The Lumberman* thinks if the garden of Eden had been as well shown up by land lawyers and agents of old, the descendants of Adam would have mobbed that lonely angel with a flaming sword who guarded its gate and kept them out. Oklahoma is evidently a more desirable country, as it has required several hundred of Uncle Sam's blue coated angels, armed with repeating rifles, to keep the people out of it. Still, we are not going there—this year the editor adds—and we are not advising any of our friends to go to stay. It may prove a good field for the tourist who represents a good lumber firm, a burial case factory, or a tombstone quarry.

Rock Cuttings in the Proposed Nicaragua Canal.

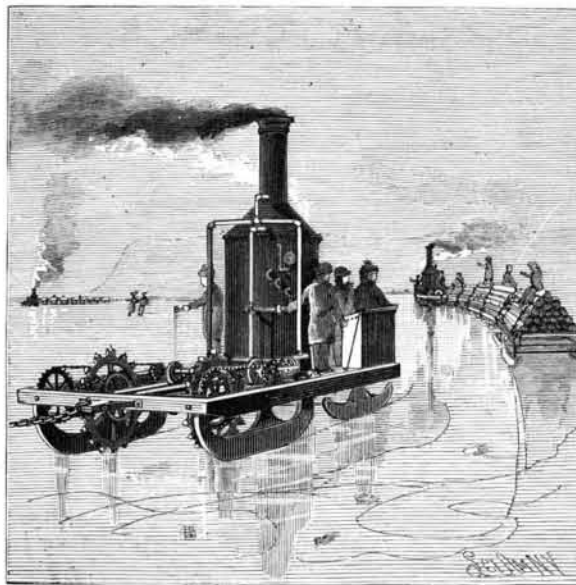
The most serious feature of the Nicaragua canal project, in a contracting and financial sense, is the great rock cut at the eastern divide, 3 miles long and averaging 120 ft. deep by 80 ft. wide on the bottom, containing in all some 7,000,000 cubic yd. of material, or say 440 cubic yd. per lineal foot. There is no precedent, says *Engineering News*, for such an enormous cut, and it has been assumed that four years, at least, would be necessary to complete it, while many question the possibility of doing it in that time. The great rock cut at the Tilly Foster mine, Brewster's Station,

N. Y., if it may be relied on as a precedent, would go far to relieve these doubts. From that cut 215,000 cubic yd. have been removed in 20 months within a lineal distance of 450 ft., or nearly 500 cubic yd. per lineal foot, and this by day work only, with a force of 150 men, or one man per yard of center line, by four cable hoisting plants only, or say one per 100 ft., and practically at the rate of about 4,000 cubic yd. per month per cable when working full time and with full force. Equal efficiency cannot be expected in tropical Nicaragua and temperate New York; but neglecting for the moment this very serious difference, a work conducted with equal efficiency, and with a cable hoisting plant for every 100 ft. of center line, would at the rate of 4,000 cubic yd. per month extract the necessary cube of 44,000 cubic yd. in just 11 months of solid work, and this without night work; while the force to accomplish this end, if the New York example were admissible as a precedent, would be about 5,300 men with 160 cable hoisting plants, or about 33 men per plant and per 100 ft.

This is not so large a number as to seem difficult of attainment, or to cause the men to be in each others' way, even if increased by a considerable percentage to allow for tropical inefficiency; and we fully believe that there are men in this country who can and will undertake to parallel this record if afforded the opportunity, and if the contracting wheat be winnowed from the chaff by some other and safer method than "lowest bid" and "influence," so that those men who really understand from experience how to handle such work may have a fair chance.

A STEAM-PROPELLED SLED.

An invention by means of which a sled is designed to be propelled by steam power, and adapted to pull a



CONNIFF'S STEAM SLED.

train of sleds, has been patented by Mr. James F. Conniff, of Oconto, Wis., and is illustrated herewith. The main frame of the power sled is mounted on sets of runners, of which the rear set is pivotally connected to the under side of the frame. On the frame is a boiler supplying steam to an engine connected with driving shafts on either side, each of the shafts carrying a sprocket wheel communicating motion by a sprocket chain to a shaft mounted transversely at the rear end of the main frame.

From this shaft power is communicated to two propeller wheels, mounted in bearings in a frame that is free to swing up and down, whereby the wheels will be always in contact with the ice or snow. The periphery of each propeller wheel has projections with sharp cutting edges, to enable the wheel to take a firm hold on the ice or snow, whereby the power sled will be capable of drawing a train of sleds connected therewith.

A Recent Cat-astrophe.

An interesting exhibition of trained cats has been conducted for some time past by Leoni Clark, known on the variety stage as the "cat king." His troop of thirty cats has been a great attraction. Philadelphia has, of late, been the scene of many performances, and on the 24th ult. Mr. Clark thought that his troop of cats needed some medicine, and he went to a neighboring drug store and had a prescription, which was tried with good results many times, put up. He then assembled his troop of educated cats in a row and began to administer the medicine. After he had gone down the line giving dose after dose as far as the thirteenth cat, cat number one, with an unearthly shriek, leaped into the air and fell dead.

Cat number two followed suit. Cat number three did the same, and so it went on until thirteen cats that had taken the medicine lay dead before him. Mr. Clark is in a terrible state of mind over his loss, and will sue the druggist, who he claims put up the wrong prescription. The druggist declares that he put up exactly what Mr. Clark's prescription called for.

Correspondence.

A Suggestion for Introducing Wires in Electric Subways.

To the Editor of the Scientific American:

In the recent article on "The Electric Subways of New York City," I was struck with the extremely slow method of introducing the small line into the duct, preparatory to drawing the cable. It occurs to me the first line might be run through much quicker by air than with the jointed rod.

I should think a specially made large sized hand bellows would be sufficient to drive through a pasteboard cone with a light line attached. The line should be taken from a light, free-running reel.

Thimbles of different sizes could be made for the different sized ducts, so the nozzle of the bellows would fit any of them. One side of the thimble may be crimped sufficient to allow the line to enter the duct.

M. A. CURRIER.

Omaha, Neb.

Semi-solid Lubricants.

To the Editor of the Scientific American:

I note in your issue of April 27 that the well known mechanical engineer Joshua Rose speaks, in his Paris letter, of the use of a semi-solid lubricant on grinders forced by screw pressure upon the journals, and in speaking of it as a new idea "of much interest" he add: "I was informed that it was proposed to try a similar device upon the axle boxes of a locomotive. I should think it likely that such an axle box would, however, require a more continuous supply of lubricant than this would give." Concerning this it might be of interest to note that the idea is not new in this country, as at least over a year ago the Chicago and Northwestern Railway were using a solid lubricant, coming in the form of candles, upon their engines.

Just how successful it was I am unable to say. It was a white substance of about the size and hardness of an ordinary candle and some three or four inches in length, used in much the same manner described in his letter.

J. M. FARNSWORTH.

Vinton, Iowa, April 29, 1889.

Natural Gas in Kentucky and Indiana.

State Geologist Gorby, of Indiana, in relation to the natural gas development in Harrison County, Ind., and Meade County, Ky., says:

So far as it has been tested, the field stretches along the Ohio River about thirty miles, beginning at a point about twenty miles below Louisville and extending below Brandenburg. It has a width of seven or eight miles in each State, and contains about fifty wells, ten or fifteen of them on the Indiana side and the remainder of them in Kentucky. It is from the Kentucky wells that it is proposed to supply the city of Louisville. It will require a pipe line about thirty miles in length, and when I was there last, work upon it was being pushed vigorously. There were originally three companies that started out to supply the city, but they are merged into one organization now.

The Harrison County wells are shallower than those in Hamilton and Howard Counties, the gas being reached at a depth of 358' in the river bottom. The bluffs along the river are about 200' high, and the wells back from the stream require more boring, so that those sunk in different parts of the field range from 358' to 550' in depth. The Hamilton and Howard County wells, as I have observed them, run from 800' to 1,000'. In some of those in Harrison County the supply is as abundant as in the average producing wells of Hamilton and Howard. Some of them are producing 4,000,000' daily, and the output throughout the field is estimated at 50,000,000' every twenty-four hours. The gas comes through a black shale, and is of about the same quality as that produced in other Indiana fields. There is more annoyance from salt water than there is in the Noblesville and Kokomo section, but this is obviated by the use of separators, which have been improved upon until some of them now work very satisfactorily.

I think there is a plentiful supply for Louisville, however, from the Kentucky portion of the field. It is astonishing what one moderately productive well will do when the gas is properly handled. In the State of Indiana the town of Portland, which has 2,000 inhabitants and several manufacturing, is supplied by one well, with a capacity of 875,000' daily, and one mill there with an engine of 20,000' each day. Of course, where it is burned as an ornament or for advertisement in large flambeaus on the streets and in public places it is different. I am only speaking of cases where the gas is not wasted.

Preservation of Milk by Freezing.

It is said fresh milk may be preserved indefinitely by freezing it and maintaining it in the frozen state until wanted for use. Many of the steamers now sailing on distant voyages are provided with steam refrigerators, in which milk and other foods may readily be preserved for any length of time.

Explosion of a Lime Light Gas Cylinder.

A serious explosion of a gas cylinder, on the 28th of January, in Dublin, Ireland, occurred, by which one person was instantly killed. It appears to be the practice abroad of compressing the oxygen and hydrogen gases up to a pressure of 750 pounds to the square inch, while in the United States the usual working pressure is 250 pounds. The particular reason for the explosion was explained by experts to be the careless mixing of the oxygen and hydrogen gases in one cylinder, which, in escaping in a room in which there was a gas light, ignited and caused the explosion. A peculiar feature of the case is that the man who was killed was one of the proprietors of the works where the gas is compressed. Their rule was to store the oxygen gas in black cylinders and hydrogen in red. The proprietor had an urgent application for oxygen gas, and being short of oxygen cylinders, took a red hydrogen gas cylinder, which he supposed was nearly empty (no evidence was shown that it was tested by a gauge to see what pressure of hydrogen it had), and charged it with oxygen gas.

The party intending to use it was notified that it was oxygen gas instead of hydrogen, but did not use it. It was afterward returned to the gas works, and the proprietor, forgetting that it contained oxygen, sent it out a second time to fill another order for a cylinder of oxygen and hydrogen. When the operator of the lime light made his connections and undertook to light the hydrogen gas at the end of the lime light jet, he was startled by a small explosion there. The cold metal of the burner, it is supposed, prevented the flame from extending back to the cylinder, and thereby prevented a more serious explosion. He at once disconnected the cylinder, labeled it "mixed gases," and returned it to the works. He also notified the proprietor of the dangerous character of the gases. But he seemed to look upon it lightly, since he told his foreman that the quantity of hydrogen was so small that there was no danger, and that he would use it himself. The cylinder was placed by itself in a room used for making mechanical drawings, in which was one gas light. But the testimony as to whether it was lighted or not is not clear; some of the employes and assistants maintained that it was. He went into the room alone and experimented with small quantities of the gas, opening the valve at the top in the usual way. Suddenly his brother, in an adjoining room, heard a slight report and crash of glass. He rushed into the room and found the proprietor lying on his back on the floor dead.

It would seem that he died from his own carelessness, as he had been advised to let the gas escape in open air.

In the United States it has become the custom to compress the oxygen gas in red cylinders and hydrogen in black. An extensive user of these gases in England states that one company doing a large business in supplying these gases there does not always adhere to the rule adopted there of putting oxygen into black and hydrogen into red cylinders, for he has had sometimes as many as a dozen black cylinders containing hydrogen delivered for one of red. To avoid errors at the works, it is suggested that the spindles and coupling screws be made larger for the oxygen cylinder than the hydrogen, and that both the cylinders be painted in totally opposite colors.

When one of these cylinders bursts from defective construction and overpressure, it is generally in the form of a narrow seam, and no damage is done unless the person happens to be near the rupture; then the force of the escaping gas, acting like a gun, will send objects before it to great distances, precisely on the principle of the dynamite air gun.

A peculiar accident of this nature came to our attention, and is related as follows: Two cylinders of oxygen and hydrogen, placed on their long sides on the floor of a wagon, were being transported over a paved road. A boy was sitting on one of the cylinders. When they had nearly reached their destination, a peculiar report was heard and the driver noticed, on looking around, that the boy had disappeared. He was found unconscious, lying in the street, about fifty feet from the wagon. At first he was thought to be dead, but he subsequently recovered and escaped without a scratch. The mystery was never explained, except that the boy says he felt a tremendous breeze of wind pass upward in front of him and was instantly unconscious. One explanation given is that as he happened to be over the rupture in the cylinder, the escaping gas issuing with a tremendous velocity, at a pressure of 250 lb. to the square inch, lifted him into the air something on the principle of a rocket. On passing near his mouth it may have taken his breath away and made him unconscious. We are indebted to the account published in the *Br. Jour. of Photo.* for the facts regarding the Dublin explosion. It is perfectly safe to use gas in cylinders tested to three times the actual pressure usually employed, and it is very rare that the bursting of one is reported. A most useful adjunct is a gauge attached to the cylinder by a T joint between the cylinder and the lime jet, since it apprises the operator of the pressure he has on hand of either gas.

Generally a trifle more of hydrogen is used than of oxygen. There are also pressure regulators made that can be attached to the cylinder for equalizing the pressure.

Natural History Notes.

Relation of Ants to the Seeds of Plants.—It is well known, says Prof. Trelease, in an address before the Cambridge Entomological Club, that in warm countries some ants carefully and systematically harvest the fruit of species of plants which are to their taste, and it would seem that they take some agricultural interest in the welfare of these plants. While this indicates a high grade of care for the food-producing species, the benefit to the plant is that which a cultivated crop receives from the self-interest of man in its preservation and propagation, without in any way approaching symbiosis.

The resemblance of some seeds or fruits to different kinds of insects or other arthropods has several times been commented on. Perhaps it is still an open question whether or not this is mimicry, but it has been so regarded by a number of naturalists, being held in some cases to secure dissemination by insectivorous birds, etc., and in others to render the detection of the seed by granivorous birds difficult. Suggestions are not wanting that in some of these resemblances, and some other seminal peculiarities, adaptations exist for securing dissemination through the agency of ants. Mr. Charles Robertson states that the arils of *Sanguinaria* seeds possess an attraction for ants, which drag the seeds off for considerable distances. According to Lundstrom, *Melampyrum* seeds resemble ant pupæ in size and form, and, he believes, in odor also, to such an extent that ants are deceived into caring for them as if they were their own pupæ, until the mistake is discovered. Mimicry, such as he suggests, is a very difficult thing to prove to the satisfaction of unbiased biologists, but observations cited by him would seem to show that unusual attention is really paid to these seeds by ants which do not subsequently make use of them for food. The bracts of some species of this genus bear extranuptial nectar glands, which Rathay, who studied them carefully, could not explain by the protective theories of Delpino and Belt, or Kerner, though they are visited by ants. As the latter are thus attracted close to the fruit, Lundstrom suggests that the office of these nectar glands may stand in close relation with the supposed mimicry observed in the seeds; but this entire subject, while full of suggestion, is still in need of careful and comparative study.

Flowers altered by Mites.—Some experiments made by Prof. Plyritsch, at Innsbruck, and recorded in the *Transactions of the Imperial Academy of Vienna*, show that double flowers may be produced by the agency of mites. He transferred some mites found on a wild double flower of *Valeriana tripteris* to other plants of the natural order Valerianaceæ, Cruciferae, Scrophulariaceæ, Commelynaceæ, etc., with the result that various kinds of double flowers were obtained, as well as torsions and fasciations of the shoots. The doubling consisted in petalody of the stamens and pistils and proliferation and duplication of the corolla. Even the leaves were affected by the mites, the margin showing comb-like teeth. In *Linaria cymbalaria* peltate flowers and other changes were found. The results obtained would appear to depend upon how far the subject of the experiment is a good host plant for the mites, the plant in such case being quite crippled. In several cruciferous plants in which the flowers are normally ebracteate, bracts were developed by introducing the mite found on the hazel to the plants. In the daisy the disk florets became green, the leaves more hairy, and the involucre bracts elongated. It was also observed that after infection lateral bud development was accelerated, while growth in length was slow.

Preservation of the Colors of Flowers.—A writer in the *Revue de Botanique* states that he has succeeded in preserving the form, beauty, and freshness of flowers by dipping them in a varnish composed of 20 parts of powdered copal dissolved in 500 parts of ether, sand or powdered glass being used to make the resin dissolve more readily. The flowers are dipped in the liquor, carefully withdrawn, and allowed to dry for about ten minutes. This is repeated four or five times in succession. A second process given is to immerse the stem of the fresh plant in a solution of 31 grammes of alum, 4 of niter, and 186 of water, for two or three days, so that the liquid may be absorbed. The plants are then pressed in the ordinary way, except that dry sand is sifted over the flowers and the packets submitted to a gentle heat for about twenty-four hours. A third process consists in plunging the plant for an instant in a boiling solution of 1 part of salicylic acid in 600 of alcohol (too long an immersion will decolorize violet flowers), and then drying between bibulous paper. For restoring the color to red flowers which have turned violet or blue in drying, a piece of paper moistened with dilute nitric acid (1 part of acid to 10 or 12 parts of water) is placed under the plant, and then the whole submitted to moderate pressure for a few seconds between blotting paper. The amount of pressure and the strength

of acid required will vary in different cases, but the green leaves should never be subjected to the acid, or they may lose their color.

Preservation of Animal Colors.—As alcohol has a tendency to alter or even wholly destroy the colors of animal specimens preserved in it, Mr. Fabre Domergue has been led to make some researches with a view to finding a substitute for it that does not possess this inconvenience. He recommends the following mixture:

Sirup of glucose, diluted.....	1,000 parts
Glycerine.....	100 "
Methylic alcohol.....	200 "
Camphor, to saturation.	

The glucose is dissolved in warm water, and, after it is cool, the glycerine, alcohol, and a few pinches of camphor are added. As this mixture is always acid, it should be neutralized by the addition of a small quantity of a solution of potash or soda. After filtering through paper, a few fragments of camphor are allowed to float upon the liquid.

This liquid is well adapted for the preservation of hard-shelled crustacea, of green, blue, or red color, and also of certain echinoderms. Most soft animals preserve their color in it, although they contract considerably.

Protective Secretions in Plants.—From some investigations made by Prof. Stahl on the use of secretions to plants, the conclusion is reached that these secretions in many plants serve to protect the latter against animals. Thus, tannin was found to be objectionable to slugs, slices of carrot dipped in its solution remaining untouched by them. On the other hand, plants containing acid oxalates of potash, such as sorrel, rhubarb, and begonias, were eaten with avidity by slugs when this salt was removed, although previously they would not touch the plants, nor would they attack carrot soaked in a solution of the salt. In the case of hellebore the vegetable poison present appears to act as a protective agent. M. 'Stahl also points out that the incrustations of carbonate of lime on saxifrages and the silicious coating on grasses and equisetums, and the raphides in plants, have a similar protective duty, since if these be removed, the leaves, etc., are speedily attacked by slugs. He found also that essential oils, such as those of rue, herb Robert and *Acorus calamus*, are also repulsive to slugs. This idea seems to receive confirmation from the well-known fact that cattle will not touch the common buttercup in its fresh state, although they eat it readily when dried, and that colchicum is always left untouched by them. Nevertheless the peppermint, and occasionally even the aconite (*A. Napellus*), is eaten in London gardens by the common cabbage moth (*Mamestra brassicae*).

Epiphytic Plants of the Tropics.—Dr. A. F. W. Schimper has published a second installment of his magnificent work on this subject, this portion relating to the flowering plants and vascular cryptogams. The order by far the most largely represented is Orchideæ, of which 119 species are enumerated in tropical America alone. Next come Filices (American only) and Bromeliaceæ 18 each, Gesneraceæ 16, Rubiaceæ 14, Ericaceæ 13, and Melastomaceæ 10. The largest number of epiphytic plants are found on the arboreal vegetation of mountain slopes in tropical and subtropical countries. Some species, but only those found on the lower branches of trees, grow also on rocks. The author describes the different ways in which the seeds of epiphytes are adapted from their peculiar habit. The most common contrivance is that they are provided with a succulent envelope which is devoured by animals, and the seeds themselves then voided on to the branches of trees; or they are so small as to be carried readily by the wind to fissures in the bark, as in the Orchideæ; or they are provided with a floating apparatus. Excluding true parasites, their nutrition is obtained in several ways. They may find their nutriment on the moist surface of the host, and are then usually protected against desiccation by the presence of receptacles for holding water. Others have aerial roots for absorbing moisture, like the orchids, or roots which reach the surface of the soil; while others again form for themselves a matrix of decaying animal and vegetable matter.

Effect of Minerals on Plant Growth.—From some recent experiments by Mr. Henri Jumelle in cultivating lupines in distilled water and in a mineral solution, it appears that the presence of mineral substances in the plant is accompanied with a greater production of parenchyma and a formation to a less degree of sustaining elements. Moreover, if the plants submitted to the experiment be dried, it is observed that, in a general way, the stalk and leaves of the plant provided with salts contain a larger proportion of water at this period than do these same organs in plants deprived of salts.

Upon the whole, the absence of salts notably modifies the structure of a plant, but the modifications seem to be due, in great part, less to the absence of salts than to the diminution of the constituent water that results therefrom.

A RACE between electrical launches lately took place in London. Five boats took part in the contest.