

## Correspondence.

## Railway Train Lighted with Acetylene Gas.

To the Editor of the SCIENTIFIC AMERICAN :

The Pontiac Pacific Junction Railway express train has been successfully lighted with acetylene gas. The train consists of the ordinary postal, express and baggage, second and first class cars. The gas is generated by a 30-light Niagara Falls acetylene gas machine placed in the baggage car. Each car is regularly piped and supplied with six 50-candle power burners. The pipes are connected with rubber hose between cars, with hose cocks. It is a through express, requiring no shunting of cars. The train has been running a month with the new light, and the management is so satisfied with their experiment that they propose to light all their trains and stations with it. The new illuminant has had a severestest. The vibration of the car does not affect the steadiness of the light. Only once were the lights extinguished, and that was by the impact of the train against a huge snow drift almost as solid as a sand bar. They were relighted at once and caused no inconvenience beyond the temporary darkness, and for a few moments the smell of escaping gas. Frost 20° below zero had no effect on the gas passing through the rubber connections between cars. Am I right in claiming for the Pontiac Pacific Junction the honor of being the first train in America to be lighted with acetylene gas?

A. HOLLAND.

Ottawa, Canada, February 20, 1898.

## Snake Charming.

To the Editor of the SCIENTIFIC AMERICAN :

My attention has been called to an article in your paper, in which your contributor states that he considers the power of snakes to fascinate birds is an exploded idea. I should like in reply to give an account of an occurrence which took place in my presence while traveling through the mountains of Kern County, California, and which I think goes far to prove the contrary.

I was riding and had off-saddled to eat some lunch when I was attracted by an unusual excitement among a flock of small birds in a neighboring tree.

On looking up I saw stretched along a limb a gopher snake, and in front of it about 18 inches distant was a bird, whose companions were making the noise that had attracted me. The bird was perfectly motionless and to all appearance was looking straight at the snake, which was gradually creeping toward its prey. When about 8 inches away, it struck and caught the bird by the breast; the latter at once started struggling to free itself, its companions trying to help it by beating the snake with their wings, but without avail.

The reptile then lowered itself toward the ground, hanging suspended by its tail for a few moments before it dropped; having done so, it lay still for a few minutes, but upon my making a movement, it dropped its prey and made off.

This incident I think proves that this particular snake at any rate had some power of fascination, and I would call the attention of your contributor to the actions, or rather want of action, in bird, as although the snake was in full view of it all the time, and notwithstanding the fact that its companions were doing all in their power to drive the snake away, it still remained passive, and apparently powerless to move.

W. R. MASON.

Bakersfield, Kern County, California.

## The Industries of Japan.

Agriculture is the chief pursuit of the people of Japan, and in the greater part of the cultivated area rice and the principal food crops, wheat, barley and soya beans, are grown. Mulberry trees are planted everywhere. Tea is mainly cultivated in the south of Honshiu and in Taiwan, Formosa. The mineral wealth of the empire is great, but much improvement is needed in mining. The coal production is rapidly increasing, especially in Kinshiu and Hokkaido. The development of the iron industry is somewhat slow, but much is hoped for in the future. The production of silver has been steadily rising; copper and antimony are also among the principal exports of the country.

The industries of the Japanese empire may be distinguished as "original" and "imported." The original industries which existed from early times are those of ceramics, weaving, embroideries, lacquer work, paper, metals, leather, wood and bamboo, carvings, camphor, vegetable wax, salt, sugar, saké, soy, oil, tobacco, indigo and raw silk. These industries seem to have been first introduced from Corea or China, but the lapse of several hundred years has obliterated the original traces. Their scope of working is generally small, and the tools and instruments used are rude and simple. The industries which have been introduced into the country are those lately brought over from Europe and America. These comprise cotton spinning, brick making, preparation of drugs and chemicals, cement works, wire making, woolen manufacture, shipbuilding, and machinery; match, paper, and soap making. These industries are generally carried on on a large scale, employing a vast number of

workmen and using water and steam power. According to the latest returns, the total number of factories belonging to companies and individuals is 5,985, 1,098 of these being provided with steam engines, and 221 with both steam and hydraulic engines.—Journal of the Society of Arts.

## Miscellaneous Notes and Receipts.

**Dull Black Varnish for Metals.**—Copper nitrate, 500 grammes; alcohol (90 degrees), 150 grammes. The copper nitrate is melted on the fire and then added to the alcohol. It is applied warm.

**For Bleaching Copper Engravings** which have turned yellow, peroxide of hydrogen, chlorine water and eau de javelle have been employed with good success. When using the last two remedies the copper prints have to be treated after the bleaching with a diluted solution of hyposulphite of soda to neutralize any traces of chlorine remaining in the paper.—Technische Mittheilungen für Malerei, December 1, 1897.

**Self-luminant Color.**—The many preparations that are luminous in the dark generally consist of calcium sulphide or barium sulphide. As regards their effect, they are much excelled by calcium tungstate, which is best prepared by heating in a Hessian crucible several hours to red heat 30 parts sodium chloride, 30 parts sodium tungstate and 30 parts calcium chloride, well mixed. The mass melts into a vitreous paste, which is bruised after cooling and breaking of the crucible and lixiviated in water, whereupon the fine crystals of calcium tungstate remain. These are fixed on the surfaces by applying a layer of glue on which the crystals are strewn.—D. Chem. Ztg.

**New Process of Varnishing Wooden Ware.**—According to the Neueste Erf. und Erf., the wooden objects to be varnished are first coated with a layer of pyroxyline, or a solution of the same in alcohol or any other volatile solvent, to which some resin varnish may be added, which body has the property not to penetrate into the wood and not to swell the wood fiber, but to leave the color of the wood unchanged. The absorption of the first coat of varnish and consequently a roughening of the surface being thus avoided, the polishing of the varnished surface after the first coat of varnish is obviated thereby. The resin varnish solution applied on the first layer may be covered by another coat of pyroxyline for protection, to which some resin varnish may likewise be added.

**Shell Gold or Ormolu.**—Ormolu (or en coquilles) is prepared in the following manner: A small, unglazed bowl is pressed full of kitchen salt and exposed for some time to the heat of a stove, covered up. The salt, after having given off its water in the heat, becomes very hard and is coarsely powdered. A small quantity of this salt powder is put with an equal volume of honey on a glass grinding plate; this is finely ground with gold leaf, thinly beaten, without pressing down hard. The salt acts mechanically as a disintegrating agent. Honey is used for moistening because the salt does not melt in it. When the gold is ground as finely as possible, it is carefully washed with plenty of pure water, until salt and honey are entirely removed. Alloys of gold become unsightly and dirty with this process, but washing with a little hydrochloric acid will remedy this.

**Producing Reliefs by Electricity.**—An electrolytic process to produce reliefs in steel has been invented and patented by Joseph Riedu, in Munich. This process is described as follows with regard to dies: An impression of the relief of a coin is made in plaster of Paris in such a manner as to form a column several centimeters in height. This column is insulated at the circumference by hard rubber and placed in a vessel with a suitable electrolyte so that the relief side is above, while the lower side reaches into the electrolytic liquid. In consequence of its great porosity, the gypsum absorbs the same until saturated. Now a piece of steel is placed upon the picture side of the gypsum column and the electrolyte is connected with the negative pole, the steel with the positive pole. The galleries of the steel which come into contact with the saturated gypsum are dissolved and by its own weight the piece of steel sinks down to the deepest galleries of the plaster model, which finishes the copy. Although the respective experiments are not yet closed, it may be asserted that not only steel but most of the other metals may be worked according to the above method. This electrogravure can, of course, also be employed for copying antique chased works of art, and will most likely soon be employed to produce counterfeits of antique articles of virtu which it will be difficult to distinguish from the originals.

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## Science Notes.

Greenwich Observatory complains that it has little clear weather. Sun and stars are wholly invisible every other day in winter, one day in four in fall, one in eight in spring, and one in sixteen in summer. In the twenty years ending with 1896 there were only eight instances of sunlight for fourteen continuous hours.

Certain women in St. Petersburg, the wives of scientists, anticipating the visit to their city next summer of Dr. Nansen, have determined to make him a unique present. It will be a square of tapestry upon which will be embroidered a map of the polar regions, with the line of Nansen's march marked in gold thread.

The French town of Etampes has introduced an interesting novelty by replacing the recording secretary of the municipal council with a phonograph. Some of the members of the council objected to the innovation on account of the too great faithfulness of the apparatus in reproducing defective pronunciation and errors of speech, but the majority was in favor of making a trial.—Umland's Wochenschrift.

There was a hot time in Adelaide, Australia, on November 10, the temperature in the shade reaching 106° and in the sun 164°. The sky looked queer, the sun was blood red, and many people concluded that the world was coming to an end. At one public school the children were seized with a panic, which was stopped with difficulty by the head master, who later kept the whole school in till it had made up the time lost in the scare.

Senhor Bôrteux, of Rio de Janeiro, Brazil, has invented a new method by which photographs may be taken under water. The light is furnished by an incandescent lamp [placed] in a steel case in the diver's headpiece. The luminous rays are projected by a reflector placed in the rear of the steel case. The electricity is provided by means of a small dynamo carried in the boat above. The photographic apparatus itself consists of a common camera placed within an India rubber envelope, the front of which is glass. The machine is regulated and pictures are taken by pressing buttons through the India rubber covering. Through experiments made in the Bay of Rio de Janeiro, it has been demonstrated that pictures can be taken under water, of objects at a distance of ten or twelve feet, as easily as they can be obtained above in the full light of day.

In view of the prominence attaching to the Yukon district recently, owing to the Klondike gold boom, a few particulars relating to the meteorological conditions under which mining has to be carried on in the latest "El Dorado" may be interesting. A winter weather record is given by Mr. E. W. Nelson in the National Geographic Magazine (November). The record was obtained in the autumn and winter of the years 1880-81 at a fur-trading station on the Upper Yukon, not far from Dawson City. It covers the period from the early autumn to the opening of navigation on the Upper Yukon in spring, and is of peculiar interest at present, as showing some of the meteorological conditions in the area which is now attracting world-wide attention. The Yukon froze over on November 2, and was covered with a practically unbroken sheet of ice for more than six months. The temperature sank steadily from the end of October, and in December the lowest temperature, -67 deg. Fah., was noted. The lowest temperatures reached in January, February and March were -41 deg., -58 deg. and 43 deg. respectively. In the last named month the effect of the returning sun became evident, the greatest range—88 deg.—being obtained during that month. Not until the middle of May, however, did the ice start on the river, and it was some weeks before the river was free.

## Ancient Varieties of Dogs.

According to D. G. Brinton, in Science, the first domesticated mammal seems to have been the dog. In the Swiss Society of Natural History, last year, Prof. Studer read a paper on ancient European dogs. The oldest variety was the so-called peat dog. It belongs to the neolithic period. There were four other varieties known in the bronze period and in that of the lake dwellings. Direct descendants of these are the German hunting hounds, the shepherd dog and the poodle.

In America there is little evidence that any dog was trained for hunting. In the far north the Eskimo dog was a beast of draught, the only one known to the Red Race. The dogs of Mexico and Central America seem to have been principally raised for food or ceremonial sacrifices. In Peru there were several varieties under domestication, two of which have been clearly distinguished.

It is noteworthy that, although in many American tribes the dog was a sacred or mythical animal in the legends, he was not regarded with affection, but with dislike and aversion, a fact strongly brought out by Von Tschudi.