

SCIENCE TELLS US -



By René Bache

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PERILS THAT LURK IN THE DEEPEST MINE SHAFTS—ROCKS THAT "EXPLODE"



VERY curious, while often exceedingly dangerous, are the "rock blasts" that occur in very deep mines. Far down in the depths of the earth the rocks are necessarily under enormous pressure. Under such circumstances this pressure may cause them actually to explode into the mine. Fragments are thrown out with violence, and somebody may get hurt or even killed.

In Houghton county, Mich., is the deepest mine in the world, shaft No. 3 of the Tamarack, which has reached a depth of one mile, lacking only eighty feet.

This, however, is by no means the deepest hole dug by man. Wells drilled for oil and gas have gone much deeper. The deepest well is eight miles southeast of Fairmont, W. Va., and belongs to the Hope Natural Gas Company. It is 7570 feet deep, not very much short of a mile and a half.

Twenty miles south of this hole is another well, the second deepest in the world, belonging to the same concern. It is 7386 feet in depth.

The temperature 7500 feet down in the deepest well was found to be slightly more than 165 Fahrenheit.

Anything that can be learned about the rocky crust of the earth and its make-up is interesting. What shall be said, then, of the discovery of a "fossil ocean" at a depth of 6280 feet in another very deep well in the same region? Actually sea water was found at that level, imprisoned there presumably since Paleozoic time.

The strata of sand, lime and slate penetrated by these borings are ancient sedimentary deposits, laid down upon the floor of a vanished sea.

Some Famous Opals

MEXICAN opals are likely soon to appear plentifully on the market again, inasmuch as mining for them has been resumed in the districts whence jewelers obtained supplies before the war.

From that source we have been accustomed to get most of our "fire" opals, which are very beautiful and brilliant, with flaming hues. This variety, however, is less highly esteemed than the so-called "noble" opal, which is whitish, translucent, and shot through with gleams of all colors of the rainbow.

Remarkably fine opals, many of them "noble," are obtained from the neighborhood of Moscow, in Idaho, where they occur in beds of volcanic ashes. Apparently their material was deposited by water, while the ashes were hot, and masses of cold cinder when broken open reveal the gem stones.

Opals are in certain respects altogether peculiar among gem stones, and more interesting on that account. Whereas other gems, such as the ruby, the emerald and the sapphire, owe their colors to mineral elements by which the crystals are stained, the brilliant tints of the opal are due to its structure, ever so many minute cracks reflecting light at different angles from their edges.

An amethyst is quartz crystal stained with manganese. Opal is quartz crystal of another variety, containing from 5 to 13 per cent of water. Both are formed by the deposition of silica from

water; and it was in this way that three molluscan shells transformed into opal, recently given to Harvard College, underwent their strange metamorphosis. The shells were in a rock; their limy material dissolved out and was replaced, particle by particle, with water-borne silica.

The most famous gem of the kind is the Hope opal, formerly the property of Henry Philip Hope, a Dutch banker, who owned the finest collection of precious stones ever got together. He liquidated the national debt of Brazil, and took his pay in diamonds, which originally inspired him with his hobby. Among his treasures were the celebrated Hope diamond and the largest existing pearl, drop-shaped and weighing three ounces.

The Hope opal (now owned by an American millionaire) is believed to have come originally from Mexico, but in the seventeenth century it adorned a Persian shrine. It represents the sun—an object of worship in Persia—with full face carved on its surface and rays supplied by an antique gold setting. Oval in shape, it is an inch in longest diameter.

A famous necklace of opals belonging to the Empress Josephine, and later the property of the widowed Eugenie (who parted with it because of a belief that it brought misfortune), is likewise owned by a wealthy American. Its great central stone is called the Burning of Troy.

Pink Cheeks

THE belles of earlier days are said to have used the juice of red geranium flowers, to give pinkness to their fair cheeks, the effect thus obtained being of greater naturalness than that bestowed by rouge.

One wonders how they did it. For the sake of experiment, the writer macerated some red geranium blossoms in a small porcelain dish with a very little water. The latter certainly did turn pink. But surely, for a rouge substitute, a lot of the flowers would be needed to furnish juice enough; and perhaps the latter had to be mixed with some sort of colorless grease, for application to the skin.

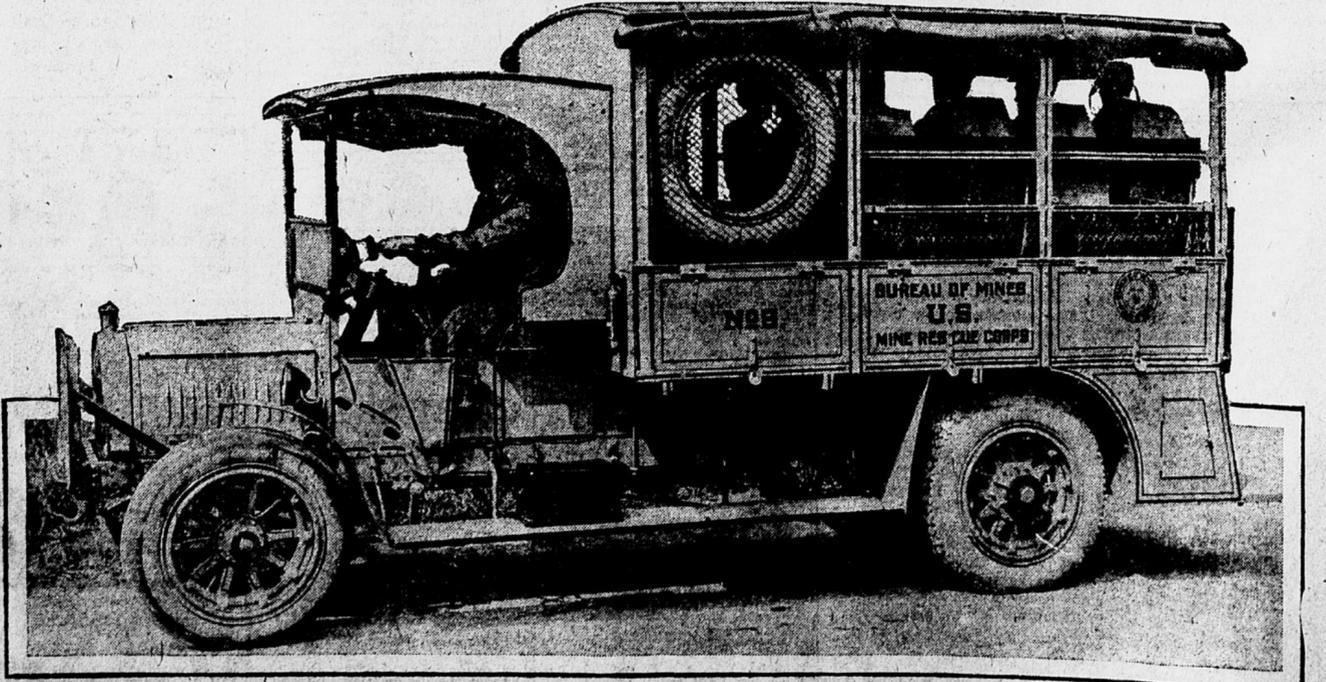
The juice of red geranium flowers is a solution of pigment contained in the petals. It is cell sap. And the same remark applies to most other kind of flowers which owe their beautiful colors to pigment solutions. In the case of yellow flowers, however, such as crocuses and buttercups, the pigment is not held in solution, but is deposited in a granular form in the walls of the cells—an entirely different method of painting.

Mine Accident! Turn in an Alarm for the Oxygen Ambulance

THE United States Bureau of Mines has adopted a new idea for mine-rescue work. It is the motor ambulance, specially equipped for that sort of business and providing ready transportation for a rescue squad. Up to now, whenever a disaster has occurred a locomotive has had to be

made ready, and a mine-rescue car attached to it, before help could be dispatched to the scene. There were liable to be unavoidable delays en route, and the method altogether was unsatisfactory. The motor ambulance, on the other hand, is at any time ready for immediate departure. Its squad of trained life-savers jump aboard, carrying their

oxygen apparatus. All other necessary equipment is already packed in the vehicle. Honk! honk! The machine is off at fifty miles an hour. The ambulance in the picture is stationed at Pittsburgh. According to the plan contemplated, there is to be one like it at every important mining center.



ONLY within the last few years has it come to be known that the so-called "miner's consumption," a cause of great mortality among workers underground, is not tuberculosis at all.

Of course, miners are liable to tubercular disease like other folks, but the malady here referred to is caused by breathing air that is laden with rock dust.

This dust, taken into the lungs, lodges in the cellular structure of those organs, which after a while

may become literally mineralized to a large extent. They are no longer able to do their work properly; they suffer coughs constantly and painfully, and he may die.

The cause of the trouble having been ascertained, means are now taken in all well-managed mines to clear the rock dust out of the air with sprays of water.

The Grass for Rugs

THE salt marshes of the New Jersey coastal region produce only one crop besides mosquitoes. It is the so-called "salt grass," which in those moist and saline areas, continually irrigated by the sea, flourishes amazingly.

Nothing seems to bother it. An amount of salt that would kill any other plant is just what it needs in its business. Diseases do not appear to afflict it; insects do not care to attack it.

Tough—that is the word best descriptive of the salt grass. It grows tall and thick. So tough are its leaves that they are broken with difficulty. Its fiber is strong and harsh. A rough and tough and useless plant.

But stay! It is no longer useless—not by any means. A very important and valuable use has been found for it. Within the last few years it has come into such wide utilization that we should

find it hard to get along without the salt grass.

This was all one man's idea. He saw that the grass was long and tough and green; also that unlimited quantities of it were to be had for the cutting. It must be good for some purpose. Surely, yes. Why not try it for weaving rugs?

There was the notion. Rugs. A few rugs woven of salt grass were put on the market and they sold like hot cakes.

Partly, of course, because they were a novelty. But they were pretty and trial proved that they wore remarkably well. Also they were cheap.

Alas! they are cheap no longer. What is there that is cheap nowadays? But the manufacture of them has become an enormous industry. The man who first hit upon the idea has made a fortune out of it. It was a case of discovering value in a thing regarded as worthless.

Bugs Out of Jobs

TWO bugs have been put out of business to a great extent by coal tar. One of them is the cochineal producer; the other is the "lac" insect.

Cochineal was used in Mexico for painting, dyeing and other purposes for centuries before the first arrival of the Spanish conquerors. The latter sent a quantity of it home, and in 1523 Cortez was ordered to get all he could of it and ship it to Spain. Later on it became a great source of revenue to that country.

The cochineal insects feed on a species of cactus called "nopal," and are gathered by brushing them from the plants into bags, after which they are killed by baking or by immersion in hot water.

As that furnished by the cochineal bug. The "carmine" and "crimson lake" used by painters are made from it. But, while it still commands a market, it has been nearly driven out by the competition of the cheaper coal tar dyes.

The same thing has happened in the case of the "lac" bug, which is native to India. In former days it was the source of a most valuable dye.

It is a scale insect, very minute and deep red in color. A parasite on certain trees, it sucks their sap and transforms it into a resin that hardens into a red or orange-colored, semitransparent, crystalline substance. The latter is scraped off of branches incrustated with it, ground fine, soaked in water, cooked over a slow fire and drawn out into thin sheets. These are the "shellac" of commerce.

There is no red dye quite so brilliant