

SCIENCE TELLS US —

by René Bache



Gas Death for Vermin

THE ground squirrel, the gopher and the prairie dog are hardly known in the Eastern part of this country. In the West, however, they are most destructive nuisances, eating the roots of growing plants and in other ways doing a lot of mischief.

A San Francisco man, James W. Van Meter, has contrived a method for exterminating them with poison gas by the help of an ingenious contrivance which subdues the little beasts in their burrows.

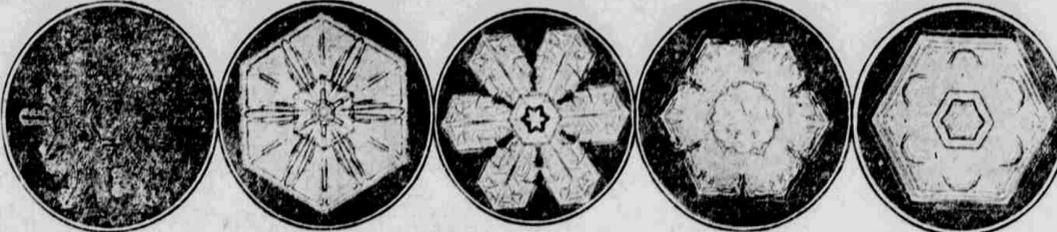
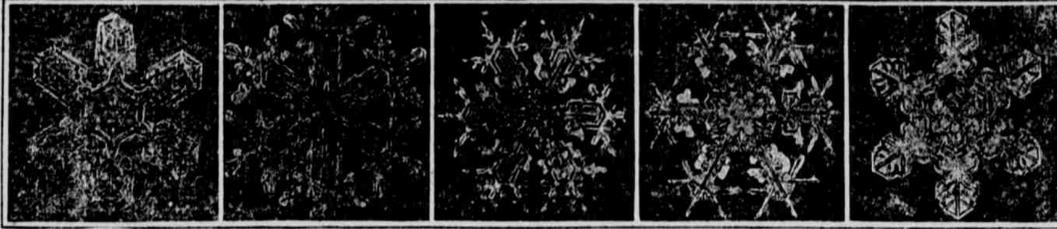
Two men do the work. One of them finds marks and prepares the burrows. The other, following him, does the poisoning, which is accomplished by discharging in the mouth of each burrow a cartridge that contains a gas-producing mixture.

The first man inserts a metal tube in the entrance of the burrow, tamps the earth tightly around it and sticks a little flag in the ground to mark it. The second man carries a cartridge-holder and cartridges—the latter being pasteboard cylinders sealed at the ends with paper and containing sawdust mixed with metal filings.

The second man also carries a small tank filled with chlorine and provided with a short rubber pipe to which the cartridge-holder is attached. He puts a cartridge into the holder and shoves the latter into the metal tube above mentioned, which the holder fits. Then he opens a valve and the chlorine flows into the cartridge, the paper ends of which have previously been ruptured.

The chlorine combines with the metal filings in the cartridge, generating a secondary gas which, being much heavier than air, descends by gravity through the metal tube and fills the burrow from end to end. It reaches the breathing nest of the occupants, and even poisons the food which the animals have in storage.

When a sufficient dose of gas has been thus administered, the chlorine is shut off by closing the valve and the holder is detached from the cartridge, which drops into the burrow. The metal tube is pulled out of the burrow entrance and earth is packed into the hole. Thus the whole operation is completed without danger to those who perform it.



The Jewels That Fall From the Skies

AMONG the most beautiful objects under the microscope are snow crystals. Being formed in free air, directly from vapor, they have an opportunity to develop complete and very elaborate forms, and of the latter an infinite variety. Many of them, one might think, would serve usefully the purposes of the manufacturing jeweler, and perhaps those of other arts, by offering ready-made and exquisite designs.

Our winter snowstorms may not always be appreciated by many folks just the coming age. They often mean delayed trunks and trunks, wet feet and colds and extra expense for snow-shoveling to such people, but in Vermont there is a man who is just hoping and praying for storms like that. This rather peculiar fondness dates back about thirty years, for it was then that Wilson A. Bentley discovered the beauty of the individual snowflake.

Even in very early times a Norwegian artist, realizing their possibilities, went to the Arctic on extended voyages to draw them. He caught them on black cloth or painted wood and made quick sketches of them as they fell. At his leisure he worked out elaborate designs by combining the original drawings.

Mr. Bentley is truly artistic, but still his pictures are absolute representations of nature, for they are photographs. His method shows much painstaking care and proves him to be a true scientist and lover of his business.

The climate of Vermont, where Mr. Bentley lives, is ideal because of its long, cold winters. From Thanksgiving to April there are many opportunities, but even at that he says:

"Photographing snow crystals is unlike any other photographic effort. Once the crystals alight on the blackened board I hold to catch them, it is a race between me and the work of evaporation. I take the blackboard indoors, where my apparatus is pointing out the window of the always cold room. Ordinary daylight is used for illumination, and holding the board by a wire (for even mittened hands must not grasp it) I press a sharp-pointed wood splint very gently upon the surface of the crystal until the latter adheres to the splint, and remove it to a glass slide under an observation microscope."

After a few have been placed on the glass slide I give a brief glance at each, holding my breath meanwhile, and if one seems to be of sufficient beauty or interest the glass slide is removed, the crystal pressed down flat against it, using a feather, and the slide and crystal placed upon the stage of the photographic microscope, re-focused, and an exposure of from eight seconds to a minute or two is given, according to lens used, the time of day and the length of the shadows.

"All snowfalls are not good ones. It is only occasionally—perhaps four to sixteen times during a given winter—that good crystals fall, and oftentimes one must hunt for good specimens among a much greater number of imperfect or plain ones. When the favorable time comes there must be no delay, and it is often the case that I have to forgo both breakfast and dinner and am half starved and chilled through and through with the cold before a favorable day's work is over."

Propagating Kiss Berries

IT HAS been newly discovered that mistletoe can be artificially propagated and so easily that any clever woman might make a good deal of money by undertaking the business.

If you will examine a berry of mistletoe closely, and pull it to pieces, you will find that it contains a tiny seed, which is separated with some difficulty from a pulp so tenaciously sticky as to suggest bird-lime.

This is a provision of nature to accomplish the distribution of the plant. Birds eat the pulp of the berries, but do not swallow the seeds, apparently dinking their flavor. They tear them out and leave them sticking on the branches of trees, where they start new plants.

To propagate the mistletoe, then, it is necessary merely to gather a quantity of the berries, separate the sticky seeds, and to place each one of the latter in the crotch of a tree-bough. There the seed will presently germinate, inserting a pseudo-root into the bark of the twig.

It is a very curious seed, not at all like that of ordinary flowering plants. In fact, it is already in itself a tiny plant, with two cotyledons which contain chlorophyll.

Before long, placed in the manner described, it will develop into a thrifty growth of mistletoe. It is a parasite, and subsists upon the juices of the tree.

But, in attempting to propagate the mistletoe, one should be mindful of the fact that the proper kind of tree must be chosen. Like other parasites, it has its chosen "hosts"; it will not grow elsewhere. Elms and hackberry trees suit it best, being themselves close kin to the mistletoe. Like a good many folks, it is content to live on its relatives. Gum trees and sweetgums, however, serve its purpose excellently.

Mistletoe is found from New Jersey southward and westward. In the Southern States one often sees trees profusely festooned with it. In Oklahoma it is so common that it has attained the distinction of official appointment as the State flower. There are 400 known species, most of which are tropical.

Rainbow Shoes

THE latest fashionable shoes in London and Paris are of all the colors of the rainbow, most striking to the eye. Bright blue and red, sometimes with uppers of contrasting hues, are favored for street wear. One shoe manufacturer offers boots with fur-trimmed tops for women. Another, Russian "gambler" footgear, with red uppers and laced with red ribbons. Another, red boots with crimson straps finished with paste-diamond buttons. A fourth, patent-leather shoes terminate with red and green designs. Shoe heels of imitation tortoise shell, or set with amber or mother-of-pearl, are novelties. Some of the women's boots have hand-painted toes.

A New Kind of Fuel

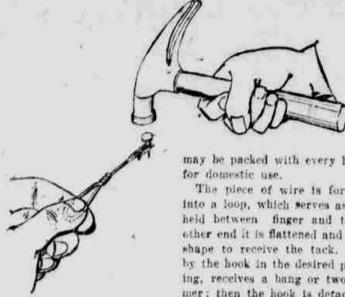
SUCCESSFUL experiments have recently been made with a fuel composed of a mixture of anthracite dust and an almost pure carbon obtained by distillation of coal-tar pitch. The dust is pressed into briquets, the coal-tar pitch product serving as a binder. In this shape it is hard, dense and in other ways very good fuel. The briquets burn like anthracite, not going to pieces like coke.

Missing Link in Rhodesia

WHAT seems to be a missing link between man and the gorilla has been found in Rhodesia, South Africa. The case is, in rather weak, on the side of a hill sixty feet high. Heretofore mining operations removed the hill, disclosing to view an immense accumulation of fossil bones of elephants, rhinoceroses, lions, hippos and other animals. Here the bones of a large animal were found, which looked like the animals and used the same as a kitchen and dining-room. But the important point is that parts of the skeleton of a very unusual sort were dug out of the mass of bones.

The bones of a monkey were found that of a gorilla, and they were very like the bones of a monkey. The leg bones were so shaped as to indicate that he walked erect, whereas the early folk of Neanderthal type, who inhabited Europe during the last Ice Age, stooped, as does a gorilla, bearing a portion of the body's weight on the hand, using the long arms almost as a man does crutches.

Anti-Ouch Tack Holder



A BOON to the householder, and especially to women, is a tack holder evolved by the genius of Albert J. Hauswama, of Butte, Mont. It saves fingers. The device is so simple and cheap, being made from a single blank of steel wire, that it

may be packed with every box of tacks sold for domestic use. The piece of wire is formed at one end into a loop, which serves as a handle, to be held between finger and thumb. At the other end it is flattened and bent into a hook shape to receive the tack. The tack, held by the hook in the desired position for driving, receives a bang or two with the hammer; then the hook is detached, and one or two additional whacks completes the operation. It is, of course, the starting of the tack that imparts the fingers. The hook holds the tack closely and firmly for driving, but has sufficient resilience to enable it to be readily disengaged.

A Tire Which Defies Broken Glass

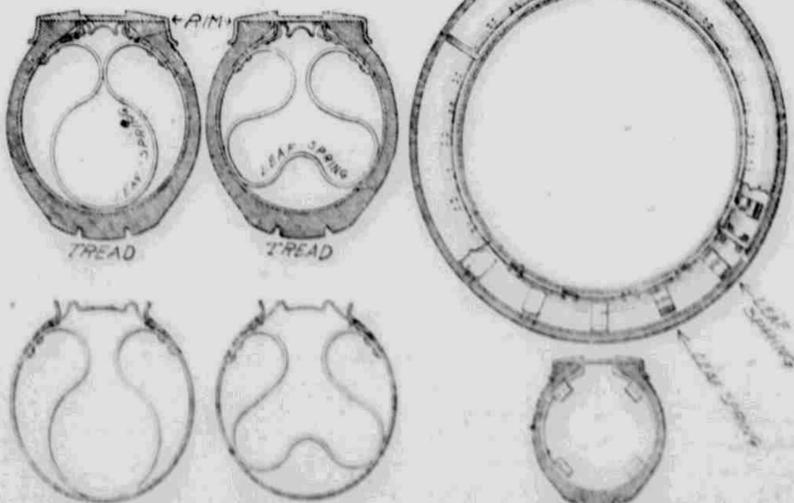
PNEUMATIC tires are surely wonderful things, but undeniably they have their disadvantages, especially when roads are strewn with broken glass and tacks. Then, too, it is a bother to blow them up.

A Cleveland inventor, Joseph J. Krall, thinks he has something better to offer. It is a resilient cylinder of spring steel, which takes the place of the pneumatic inner tube, with leaf-springs fixed at inter-

vals around the inside of it to absorb shocks. It is not a complete cylinder, this inner tube of steel, but has a gap all around where it meets the rim of the wheel. The edges of the gap are joined by springs, this method of construction giving the requisite resilience. The leaf-springs are set cross-wise of the axis of the near-cylinder, and are curved in two patterns which are fixed within the tube alternately. One pattern

takes up the shocks from the tread of the tire, the other re-enforces the tire against shocks to its sidewalls.

The spring-steel tube is of course a ring; but, to make possible its introduction into the tire casing, it is made in two halves. First one-half is put in (being secured by flanges), and then the other, making the tube complete. It remains only to put the rim on the rim in the usual manner.



Defeating Death in Quarries



Pumping air laden with granite dust through a glass tube containing sugar while a workman operates an air-driven chisel.

A DISEASE known as "stone-cutters' consumption" commonly afflicts artisans employed in the quarries. They breathe the air that contains the particles of rock, which, deposited in the walls of their lungs, make trouble.

Workers in granite quarries must, because that kind of rock is highly composed of silica, which is one of the hardest substances in nature. Limestone and other softer rocks are not so bad.

Granite is cut with high-power pneumatic tools, and a profuse stream of air is used to blow the air of the stone where the work is done. The heavy particles fall quickly, to the ground, but the fine ones remain suspended in the air for a long time. It is these minute bits that give the trouble.

In the course of time a worker who inhales granite dust has a good deal of it deposited in his lungs. As a result, the lung tissue becomes harder and less elastic. The first symptom to be observed is shortness of breath.

Eventually he must find himself incapacitated for labor, and perhaps he may die of this insidious ailment.

The principal granite-producing town in this country is Barre, Vt., where there are many plants devoted to finishing, for monumental and building purposes, the rock quarried in the hills nearby. Several thousand workers are employed in these plants.

The Massachusetts Bureau of Mines has recently undertaken a study of conditions at Barre, with a view to recommending better working conditions. The breathing of stone-dust may be minimized, by providing

inquiry has necessitated a measurement of the quantity of dust contained in the air of the shops. This was accomplished by filtering a definite number of cubic feet of air with a four-pump through granulated sugar held in a glass tube. The sugar retained the dust. Afterward the sugar was dissolved in water and filtered through paper which retained the dust particles. The paper was removed, and the dust weighed. Finally the dustiness of the air was determined in relation to particles in the cubic foot.

Missing Link in Rhodesia

WHAT seems to be a missing link between man and the gorilla has been found in Rhodesia, South Africa. The case is, in rather weak, on the side of a hill sixty feet high. Heretofore mining operations removed the hill, disclosing to view an immense accumulation of fossil bones of elephants, rhinoceroses, lions, hippos and other animals. Here the bones of a large animal were found, which looked like the animals and used the same as a kitchen and dining-room. But the important point is that parts of the skeleton of a very unusual sort were dug out of the mass of bones.

The bones of a monkey were found that of a gorilla, and they were very like the bones of a monkey. The leg bones were so shaped as to indicate that he walked erect, whereas the early folk of Neanderthal type, who inhabited Europe during the last Ice Age, stooped, as does a gorilla, bearing a portion of the body's weight on the hand, using the long arms almost as a man does crutches.

Phone and Gas Explosions

WHETHER supposed that a telephone instrument could cause a disastrous explosion? Not in a dwelling-house or business office, happily. The air must be laden with a combustible gas to make such an explosion possible. This very condition often exists in mines, however, and the phone may ignite the gas with calamitous results.

It is not the small current of electricity carried by the phone wires that does the mischief. The magnet is responsible. One enters the telephone box and the ringing of the magnet is liable to raise its ignition.

Probably many a mine explosion has been thus caused, though until recently the possibility of such a thing was not thought of. To find out if it could happen, the Bureau of Mines rigged a telephone inside of a closed chamber filled with a mixture of air and gas, and made an arrangement whereby the rings could be operated from outside. In a series of trials a number of explosions were produced. The first turn of the crank did it in one instance.

The moral seems to be that telephones in mines should be made gas-tight and gas-proof.

Weld With Copper

A NEW and very useful welding process is based upon the fact that if a piece of copper on an iron plate be heated in an atmosphere of hydrogen, the copper will spread over the iron in a thin, penetrating film, like butter on hot toast.

Thus, if the copper be melted between two pieces of iron, it welds them together in a surprisingly intimate fashion, the copper film actually working itself in between the crystals of the iron.

By this process it is practicable to join together, without screws, machine parts which can be most conveniently made in two pieces. Blades for steam turbines are among the articles which have been fabricated by this simple and novel means.

The Cost of "Eats"

THE people of the United States spend more than \$39,000,000 a day for food, or nearly a billion and a half dollars a month. Nearly one-third of the money goes for bread, potatoes, fruits, sugar and other "grub" of a vegetable nature. More than two-thirds is spent for meat, fish, eggs, butter, cheese and lard. The average householder hands over to the butcher more than one-fifth of his income. The people of this country consume in a year two and a half billion gallons and nearly ten and a half billion eggs of milk. But a large part of the milk goes to make 1,000,000,000 pounds of butter, 400,000,000 pounds of cheese and 200,000,000 gallons of ice cream.

Lizard Skin Leather

THE Island of Ceylon, which sent peacocks, monkeys and baby elephants to King Solomon, for that monarch's zoo, is remarkable for a varied and interesting fauna. One of the oddest of its animals is a huge lizard, called the embroyga, which attains a length of four and one-half feet. The embroyga is a very handsome reptile, beautifully marked, and its skin when tanned afforded a tough leather of excellent wearing quality and waterproof. It is used for making women's shoes and, with the idea of introducing it in this country for that purpose, specimen hides have recently been sent to our Department of Commerce by the American Consul at Colombo.