

## MINERALOGY

# Tricks with Minerals

They can expand, be shredded into silky fibers and woven into cloth, take their own photographs, make you see double and serve in other odd ways.

By **MARTHA G. MORROW**

► **MINERALS** are nature's favorite tricksters. Some minerals can be shredded into silky fibers and woven into cloth. Others slowly open out when heated until they are ten or twenty times their original size. Another can be made to take its own picture on a film negative.

One mineral is much harder crosswise than lengthwise. Another makes you see double. A third looks like a carefully carved cross. Amateur prospectors have been fooled into mistaking crystals of iron and sulfur for gold.

Pitchblende, the mineral from which radium and uranium are derived, will take its own photograph. When placed next to a piece of film, the mineral furnishes its own light and does the exposing by itself. The radioactive parts make spots on the film and thus record their formation.

Asbestos can be separated into innumerable fibers. There are two types of asbestos: amphibole asbestos, to which the name was originally applied, and serpentine asbestos, the type used chiefly in commerce today. Asbestos is ideal for fire-proofing and insulation. It will not burn and does not conduct heat well. The flexible fibers may be matted together or woven.

Every theater has an asbestos curtain that can be lowered to cut off a fire backstage. Firemen wear asbestos suits when they rescue people from burning buildings and flaming airplanes. Automobile brakes and clutches are lined with a woven asbestos fabric. Lower-grade, shorter-fibered asbestos and the waste from mining are made into shingles, slates, boards and other fire-proof materials.

All forms of mica tend to split into thin sheets, but vermiculite is a special type that slowly opens out when heated. If a piece of vermiculite is held with a pair of tweezers, the heated mineral takes on brilliant, shining colors and fans out to many times its original size. When placed in a pan, the mica swells and curls into worm-like forms so that it actually seems to crawl.

"Sulfur diamond" is the name sometimes given to pyrite, a light, brassy-yellow mineral that amateur prospectors have occasionally mistaken for gold. This iron mineral is found in most parts of the world, and the bright cubes have been used in jewelry since the earliest times.

Pyrite is harder than ordinary steel, while gold may easily be scratched with a knife. In spite of being so abundant, pyrite is seldom used as an ore for iron, since the sulfur makes the metal brittle and is not easily gotten entirely out of the iron. Pyrite may be used in the manufacture of sulfuric acid, important to many of our industries, and also is a source of sulfur dioxide, used in the manufacture of paper pulp.

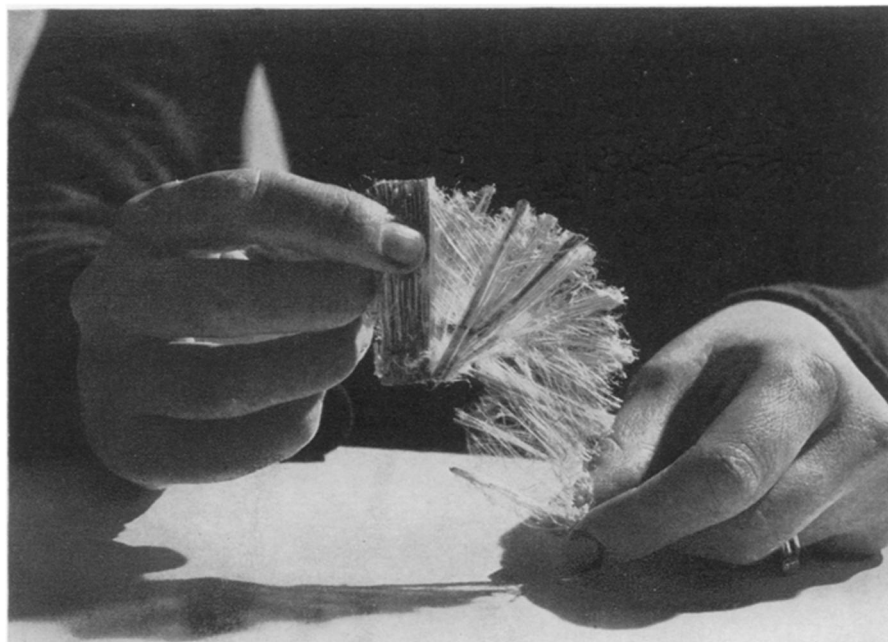
Kyanite, sometimes spelled cyanite, is a remarkable example of crystals that are harder in one direction than in another. Whereas you may leave a fairly distinct mark on the pearly-bladed crystals when scratching them lengthwise, in some

cases no mark will be left at all when scratching the crystals crosswise. Blue, transparent crystals of kyanite are occasionally cut into gems. The common mineral is used for electrical porcelains and linings for all kinds of furnaces, fire pots and crucibles. It is also used in making tough glass, spark plugs and hotel ware.

Hematite, the most common of the iron ores, occurs in a number of forms. In its harder forms, fresh surfaces of hematite free from powder are steel-gray to iron-black in color. But when something harder is run across its surface, a cherry-red streak is left. In olden days it was known as "bloodstone" since the mineral, when finely ground and suspended in water, looks like blood.

The hard variety of hematite is not transparent except when sliced very, very thin. Then it appears to be blood-red when the light shines through it. It is used in making intaglios, where a design is cut into the stone.

Nails and paper clips may be picked up by another mineral, which acts as a natural magnet. Lodestone is a variety of magnetite, a compound of two iron oxides. It is usually found in rocks that



**FIRE PROTECTION**—Asbestos can be separated into silky fibers for fire-resistant clothing. Photograph by Fremont Davis, Science Service Staff Photographer.

nave been heated, squeezed, and changed in the depths of the earth.

Nature's jackstones are the large twinned crystals known as staurolite. Some of the more perfect crystals simulate Roman, Maltese and St. Andrew's crosses. Dark brown in color, they may be as much as an inch in length.

You can see double with a crystal of Iceland spar. Owing to the strong double refraction of this pure type of calcite and the consequent wide separation of the two polarized rays of light passing through the crystal, an object viewed through the crystal appears double. It is used principally in such optical instruments as polarizing microscopes, photometers and others in which light is polarized.

Petrified wood that looks exactly like the trunks and branches of trees is not wood at all, but a form of quartz. It is

formed by silica that slowly replaces wood, cell by cell, until no trace of the original organic material remains. So perfectly has the original structure been preserved that it is easy to identify the kind of tree the quartz has replaced and to tell its approximate age by the annual rings.

Another mineral, whose deposits vary with the season and the climate, is one that everyone has seen without recognizing it as a mineral. Ice, as much a mineral as quartz or mica or hematite, is a varied and beautiful crystal. In the form of snow, it is doubtful whether any two crystals in the history of the earth have ever been absolutely identical.

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If you would like to have samples of six tricky minerals, you can secure the Mineral Unit of THINGS of science, a kit prepared by Science Service, by sending 50 cents to SCIENCE NEWS LETTER, 1719 N Street, N. W., Washington 6, D. C., and asking for Things unit No. 61.

#### PSYCHIATRY

## "Social Psychiatry"

**A new science must be developed to treat the ills of nations and economic or other groups instead of just individual ills, Navy doctor predicts.**

► A NEW AGE threatened by the wholesale destruction possible with the atomic bomb may require psychiatrists to develop a new "social psychiatry" to treat the ills of nations instead of just individuals, Capt. Francis J. Braceland, U. S. Navy psychiatrist, told a conference of the Sixth Service Command in Chicago. They may some day be treating the conflicts between capital and labor or between races or families.

Doctors, he said, may have to come out of their offices and hospitals to study the world in which their patients live, following the example of the atomic physicists who can no longer be thought of as devoting themselves exclusively to the cold calculations of their science now that they are publicly discussing the ethics and morality of atomic bombing.

This will require some adjustments on the part of the psychiatrists, Capt. Braceland warned his colleagues. One of their difficulties has been the tendency to operate in a vacuum.

"We have been able to have our patients adjust and apparently recover in our sanatoria," he said, "but they frequently have not been able to hold their gains in society."

Another difficulty is that what psychiatrists have learned about individuals

may not apply at all in treating groups.

"It is unjustifiable to speak of a people as being 'schizoid' or a nation as being 'paranoid.' These are the symptoms of individuals. There are no data on record which indicate that we can transfer or translate our concepts of individual psychopathology to group psychopathology and formulate a workable system. Therefore, a whole new framework of reference and inquiry is required for the background of the social psychiatry of the future."

The complexities of modern society make its ills require the services of more than one group of specialists and call for the pooling of the resources of experts from many fields, Capt. Braceland said.

"Psychiatric meetings should be attended by other scientists such as economists, sociologists, philosophers and cultural anthropologists. Because of our isolation, we have become inbred and new ideas are looked upon with suspicion. Our meetings are the occasions to rehash old ideas. We write our books for one another and not for the people who would profit by reading them.

"It seems as though in our present manner of thinking and experimenting in this century that something has been left out or forgotten. Too little attention

has been paid to the essential virtues, to the dignity and worth of man. The same thing has happened to nations that has happened to individuals—loss of mutual trust and loss of a sense of values. In individuals in general it seems as though it is not the basic truths which count any more. We are off on the periphery and interested in inconsequential things. If it were announced that one of the eternal truths would be discussed tomorrow morning, it would attract but little attention, but if it were announced that a thousand pairs of nylon stockings would go on sale in a certain store, they would have to bring out an extra detail of mounted police.

"It is certain that we will have to return again to the principles of first things first and a deep sense of individual responsibility and fundamental honesty before we can make strides toward either individual or international good will. It is these ordinary virtues which moor the individual securely when the gales are blowing. Every psychiatrist knows how difficult it is to treat a person who has no roots and nothing to tie to."

*Science News Letter, December 1, 1945*

*Thorium*, a radioactive element held by some as next in importance to uranium, has been found in India.



*Photo courtesy Ohio State University*

### CHART INFRA-RED ABSORPTION with SPEEDOMAX

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