

GEOLOGY

**Geological Dating
By "Fossil" Tracks****See Front Cover**

► THE TINY ATOM has left permanent microscopic "fossil" tracks in the earth's rocks.

The fossil tracks, discovered by Drs. P. Buford Price and Robert M. Walker, General Electric Research Laboratory, Schenectady, N. Y., were produced in minerals by uranium atoms that underwent natural fission.

Seen on this week's front cover, magnified 5,000 times, is a burst of fossil tracks radiating from a speck of uranium in a sample of mica, a common mineral. The individual tracks in the background were produced by fission fragments from single uranium atoms. The age of this specimen, determined by comparing the ratio of fossil tracks to total number of uranium atoms in the sample, is one billion years.

Overlooked by scientists until now, these tiny tracks hold a key to the age of the minerals in which they are preserved and Drs. Price and Walker have developed a simple and inexpensive tool for geological dating using these tracks. In the distant past, the rocks of the earth's crust solidified from molten material. With the new dating tool, scientists may be able to determine how long ago many rocks were formed. Only for rocks over a billion years old did the technique appear to "break down," apparently because of slow "fading" of the tracks.

The new dating technique is not limited to terrestrial rocks. It also can be used to study the history of meteorites, chunks of interplanetary debris that sometimes plunge to the ground after a fiery passage through the sky. The results may provide new clues to the age and origin of the solar system.

Drs. Price and Walker discovered the fossil particle tracks in a sample of mica, a mineral found in rocks throughout the world. The two physicists point out that an "atomic clock" has been ticking away in minerals for billions of years—ever since they solidified. All of these minerals, including mica, contain at least a trace of uranium, a radioactive element.

The atoms of a radioactive element are unstable and decay at a known rate into atoms of elements that are not radioactive. Some uranium atoms decay by undergoing fission, splitting spontaneously into two fragments of approximately equal size. As these fission fragments move apart in a piece of mica, they leave a trail of damage. This damaged region, about 0.0005 inch long by a few atoms in diameter, constitutes a permanent fossil record of each tick of the atomic clock.

Drs. Price and Walker discovered a method for enlarging the tracks by dipping the sample of mica into hydrofluoric acid. The acid etches out the damaged regions, as well as some of the surrounding material, making the tracks visible even through a low-power optical microscope.

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SOCIOLOGY

**Medgar Evers' Death
To Focus Public Opinion**

► THE DEATH of Medgar Evers, a top integration strategist, is expected to have powerful, far-reaching consequences for the civil rights cause.

It is likely to shake up the South—whether they admit it or not—and rouse the North to face its own problems.

Mr. Evers, shot in the back when returning from a civil rights meeting in Jackson, Miss., is now a martyr to his cause. The impact of his death, Dr. Mulford Q. Sibley, professor of political science at the University of Minnesota, told SCIENCE SERVICE, is all the more powerful because it was set against the background of Negro non-violence.

Mr. Evers' death, he predicts, will "focus public opinion" and "lead thousands of people—North and South—to think a little more profoundly than they have done."

Even southern segregationists, Dr. Sibley said, may be shaken by the event. The very vehemence of their segregationist position indicates that deep down inside, they are uncertain. The drama of Mr. Evers' death, he explained, may bring their uncertainty out into the open and soften their positions.

To the southern moderates, Dr. Sibley said, the event is likely to "lend courage." Many who have hesitated to speak out in the past may now be roused to take positive action.

In the North, Mr. Evers' death "dramatizes the need for action" in many areas of civil rights. Dr. Sibley said it may bring an awareness of the "terrible" situation existing in northern cities. It is hoped the awareness will bring remedial action.

These predictions are based on studies of non-violent resistance through the ages. Dr. Sibley's book, *The Quiet Battle*, to be published next month by Anchor Books, shows the impact of non-violent movements on past history, and tells of the rallying force of the non-violent leader and martyr.

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MEDICINE

**Science Fair Winners
Exhibit at AMA Meeting**

► THREE FUTURE medical researchers, now in their teens, exhibited the projects that won them American Medical Association awards last month at the National Science Fair-International in Albuquerque, N. Mex., at Atlantic City.

Their original research work was displayed among the 350 exhibits at the AMA convention. The AMA was the first of 23 professional societies and organizations to present special awards to the fair finalists. This year one-fourth of the finalists said they hoped to pursue medical careers.

The young AMA exhibitors are Deborah Chase, 17, Bronx High School of Science, New York; Rhea Louise Keller, 17, New Haven High School near Fort Wayne, Ind.; and Edward J. Duffy, 18, Stranahan High School, Fort Lauderdale, Fla.

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Questions

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SOCIOLOGY—Why are the better informed more confused in their views on religion? p. 405.

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