overlooked, these experts state in a report published and distributed by the organization. The booklet is particularly for fire departments that may be called to fight blazes in buildings where radioactive materials are present.

Radioactive materials produced by the U. S. Atomic Energy Commission are in use by over 430 organizations in the United States and 160 institutions in other countries. Over 12,000 individual shipments of 100 different kinds of radioactive substances have been made by the A.E.C. to institutions in the United States and 830 radioisotope shipments have gone to foreign countries.

The report offers safety precautions for handling radioactive materials, and emergency procedures for fire fighting personnel in areas where such substances are used. It points out that "these radioactive isotopes and isotope-labeled compounds or tagged radio-chemicals are utilized in quantities so small that they do not of themselves contribute to the cause of fire, nor do they tend to increase the intensity of combustion."

Because a certain amount of radiation is continuously emanating from radioactive substances, under some circumstances a degree of hazard may be presented to fire fighters. "It is just as important that these hazards should not be unthinkingly exaggerated as it is that they should not be overlooked."

Science News Letter, August 19, 1950

METALLURGY

Tin as Semiconductor

➤ TIN is now being added to the small list of the strategic materials that will act as semiconductors, the class of substances that are extremely useful in electrical applications. Semiconductors also show promise as photo-electric cells.

This semiconducting tin, however, is not the same form of tin that is so familiar in tin cans. It is a special form of that element, having a different crystal structure. It is related to normal tin in a way similar to that in which diamond is related to carbon black. These two are the element carbon in different crystalline modification.

The unusual form of tin was first discovered more than 100 years ago. In 1833, in a church in Germany, it was noticed that certain of the organ pipes were crumbling away. This deterioration of the tin pipes made them look much as if they had been attacked by fungus disease, and the crumbling was known as "tin disease."

Some specimens of this different form of tin, or graytin, as it is new called were preserved, although the church organ pipes were replaced. Scientists today are thankful that these specimens were saved, for they find that it is extremely difficult to produce the unusual form of tin without first having seeded the laboratory with the rare crystals.

The reason for needing this seeding crystal is somewhat analogous to the reason that impurities are needed before water freezes at 32 degrees Fahrenheit.

In 1899 Ernst Cohen, a Dutch physical chemist, discovered that the gray metal found when the church organ pipes deteriorated was an allotropic form of tin. Little work had been done since then with this material until about two years ago, when Prof. G. B. Bush of the Physikalisches Institut Technischen Hochschule in Vienna.

He presented a report of his work showing tin's promise as a semiconductor to the International Conference on Semiconductors held in Reading, England, recently. Other scientists had independently come to the conclusion that this unusual metal was worth investigation. In this country, Dr. R. G. Breckenridge, of the National Bureau of Standards in Washington, is directing his attention to growing single crystals of the substance.

The two most useful materials for semiconductors are germanium and silicon. Just below these two elements in the periodic table is tin. Normal tin shows only the expected metallic traits. The rare crystals, however, are in the in-between land of semiconductors.

Physicists divide matter into three groups when they are discussing its electrical properties. One group is the metallic conductors, those that readily transmit electricity. Another group is the insulators, conducting electricity to a negligible degree. Between these two groups lie the semiconductors.

The transistor is one of the devices developed to make use of the properties of semiconductors. It amplifies electric currents, and consists only of a tiny crystal of germanium with two closely spaced metallic points pressing on it.

Rectifiers are another use for the semiconductors. These materials find application in radar and television sets.

Science News Letter, August 19, 1950

METEOROLOGY

Quebec Crater May Be Mark of Ancient Meteorite

➤ THE world has another scar that may divert men's minds momentarily from the lesser but more dangerous possibility of atomic bombs blasting our cities.

Exploration of a supposed meteorite crater in northern Quebec, as reported from Toronto, creates great interest among geologists. It is an ice-filled basin, about two and a half miles across, believed by Dr. V. Ben Meen, director of the Royal Ontario Museum of Geology and Mineralogy, to be caused by a great object from outer space that smashed into the solid granite crust of the earth. It is larger than Meteor Crater in Arizona.

The meteoritic origin of the Quebec crater has not been bolstered by the finding of iron fragments as in the case of the Arizona scar or similar natural phenomena in Siberia and Australia.

In the Carolinas there are depressions that were once supposed to be caused by similar giant meteorites striking the earth, but this theory is not now in favor. Less spectacular erosion is now believed to be the cause.

Snow and ice even in summer hamper the search for positive evidence of fragments of the Quebec meteorite, and other expeditions will be needed.

The two best authenticated meteorite falls both occurred in Siberia. One on June 30, 1908, in northern Siberia was recorded on earthquake registering instruments but its effect was not nearly that of the scars produced in Arizona and Quebec. On Feb. 12, 1947, another Siberian fall, near Novopokrovka, peppered the earth, but again it was small in comparison with the presumed Quebec occurrence of thousands of years ago, now discovered.

Science News Letter, August 19, 1950

PHYSICS

Uranium Is Superconductor At Very Low Temperatures

➤ FURTHER evidence that uranium, atomic bomb material, is a superconductor at extremely low temperatures is offered in Cambridge, Eng.

Drs. B. B. Goodman and D. Shoenberg of the Royal Society Mond Laboratory have found that uranium is a superconductor near absolute zero, 459.6 degrees below zero on the Fahrenheit scale. They also found that the temperature at which the metal became a superconductor varied with the amount of impurity present. They reported their findings in the British journal. NATURE (March 18).

The phenomenon of superconductivity is a sort of "perpetual motion." There has been a certain amount of controversy among scientists as to whether uranium was superconducting near absolute zero.

A startling demonstration of superconductivity can be made by cooling a superconducting metal saucer until it is close to absolute zero. A bar magnet brought close to the saucer sets up an electric current in the metal. This causes a resistance to the further movement of the bar magnet toward the saucer. The magnet then floats above the saucer, literally suspended by nothing, like the legendary Mohammed's coffin.

Although at present time there are no practical applications of the strange behavior of some metals at very low temperatures, researches at these temperatures are helping us to learn more about the properties of matter.

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