CHEMISTRY

The Chemist Now Aids In Solving Crime Mysteries

TRACES of lead, benzene and gasoline found in the tissues of two dead men and the amount of salt in the left side of the heart of a body pulled out of the water—these results of chemical analyses enabled police to solve the mysteries of how the victims met their deaths, Dr. Alexander O. Gettler told members of the New York Electrical Society at their annual Science Forum.

Dr. Gettler is toxicologist to New York City, professor of chemistry at Washington Square College, New York University, and professor of toxicology in Bellevue Medical College.

Discovery by chemical tests of the lead, benzene and gasoline in the tissues of two dead men showed that they died accidental victims of their own attempt at arson. Dr. Gettler described the case and the chemist's role in its solution as follows:

"Two men were found dead in the cellar of a building. Investigation revealed that they had poured some volatile inflammable liquid over paper and wood intending to light same and put the building on fire. They noticed somebody on the street opposite this building and therefore they waited until this party walked away. While thus waiting, they inhaled the fumes of the liquid they had poured upon the materials in the cellar. They collapsed and died.

"By chemical analysis we isolated from their brains, lungs and livers some gasoline, some benzene and some lead. The explanation follows. The liquids which they poured upon the materials in the cellar were benzene and ethyl gas. The lead found in their tissues indicated that it was plain ethyl gas rather than ordinary gasoline."

Micro methods for isolating not only lead and benzene but ether, ethyl chloride, ethylene chloride, carbon tetrachloride and similar substances have been devised, Dr. Gettler said. These methods are valuable in detecting the cause of death since many people are killed each year by the inhalation of these anesthetics and cleaning fluids.

Explaining how chemistry can tell the police whether a dead man pulled from the water died by drowning or was killed and afterwards thrown into the water, Dr. Gettler said:

"The circulating blood of all people contains a definite amount of salt. Therefore, the salt content of the blood of the left heart chamber and the right heart chamber is the same. When people drown in salt water, the salt-containing water not only reaches the lungs but circulates as far as the left heart chamber and therefore increases the salt content of the blood therein. The person, however, dies long before the circulation may carry the salt water to the right heart chamber.

"Therefore in all salt water drownings the salt content of the left heart chamber is always much higher than that of the right heart chamber. In normal deaths, not drowning, the salt content of both heart chambers is the same.

"In fresh water drownings water only reaches the left heart chamber and therefore dilutes the salt content. In these fresh water drownings, therefore, the blood of the right heart chamber is always more in salt content than the left heart chamber."

He also described a method of determining alcohol in the human brain.

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CHEMISTRY

Thorium and Uranium Now Find Use in Industry

THORIUM and uranium, heavy elements continually breaking down in nature's process of radioactive disintegration, are now used by industry. New photoelectric cells for studying ultraviolet radiation in that region of light which produces sunburn employ uranium, while thorium is placed in many types of vacuum tubes. Both thorium and uranium are metals.

These little known practical applications of thorium and uranium were described before the meeting of the Electrochemical Society by J. W. Marden of the Westinghouse Lamp Company.

When a layer of thorium only a single atom thick is coated on a tungsten filament in a lamp, the lamp filament increases its emission of electrons. The electrons are electrical charges which constitute the current in radio vacuum tubes and X-ray tubes. Where an increased electron emission in a specific tube is desired the thorium coating is sometimes the answer to the problem.

Uranium, sensitive to light, is used in photoelectric cells where science needs an instrument to study the intensity of the invisible ultraviolet rays. By enclosing the uranium photocells in glass bulbs which cut off waves below a certain region of the spectrum, a selective apparatus is obtained useful in investigating the radiation which produces sunburn, or helps the body make its own vitamin D. Especially, reports Mr. Marden, are the new selective uranium photocells valuable in industries where ultraviolet light is used for irradiating food products to increase their vitamin D content.

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