

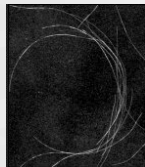
Dirt for Detectives: The use of soils in criminal investigations

A famous old case:
Margarethe Filbert case (1908)
(another victory for Georg Popp).

A woman by the name of Margarethe Filbert was found murdered near Rockenhausen in Bavaria, Germany.



Aware of Georg Popp's work in the Disch Case, the District Attorney of Kaiserslautern sought out Popp to examine evidence gathered at the crime scene (in particular, samples of hair found in the victim's hand).



Popp's examination the hair revealed that it was derived from the victim, not from the murderer.

Other material evidence proved more revealing.

The principal suspect in the case was Andre Schlicher, a factory worker and farmer.



Schlicher's neighbours suspected that Schlicher may have been involved in the murder (he had a reputation for being a bit of a scoundrel and was previously suspected of poaching).

Evidence on Shoes

Popp noted, with interest, an encrustation of soil on Schlicher's shoes (the thickest part immediately in front of the heel).

Significantly, it was established that Schlicher had worn the day of the murder and that his wife had cleaned the shoes the previous night. Popp realized that the soil would be telling evidence (it could only have been picked up on the day of the murder).

Schlicher vehemently denied his presence in the field where Filbert's body was found.



Evidence in Abandoned Building

Another significant body of evidence surfaced in an abandoned castle near the crime scene. Here, a pair of pants, together with a gun and ammunition were found.



Schlicher admitted his ownership of these objects, but claimed that they were deposited in the castle before the day of the murder.

Follow-Up Sampling

Popp proceeded to collect soil samples from sites of significance and make some additional observations on the characteristics of these sites.

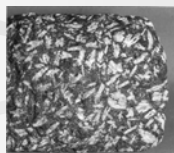


The following features of interest were noted:

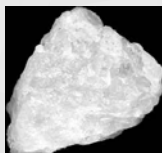
1. In the yard of the suspect's home were abundant green goose droppings



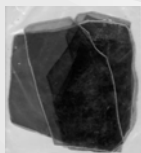
2. Soil sampled from the field owned by the suspect was found to contain fragments of porphyry (igneous rock with large crystals set in an otherwise aphanitic texture), a distinctive "milky" white variety of quartz, mica, and various organic remains (root fibres, straw and leaves)



porphyry



milky quartz

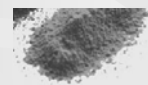


mica

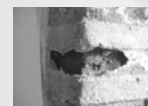
3. Soil in the vicinity of the abandoned castle was found to contain coal particles, brick dust, and fragments of cement (masonry) derived from the castle walls.



coal particles



brick dust



cement (masonry)

4. Soil at the crime scene was found to contain fragments weathered red sandstone, angular grains of quartz, red clay, and only traces of vegetation.



red sandstone

angular quartz grains

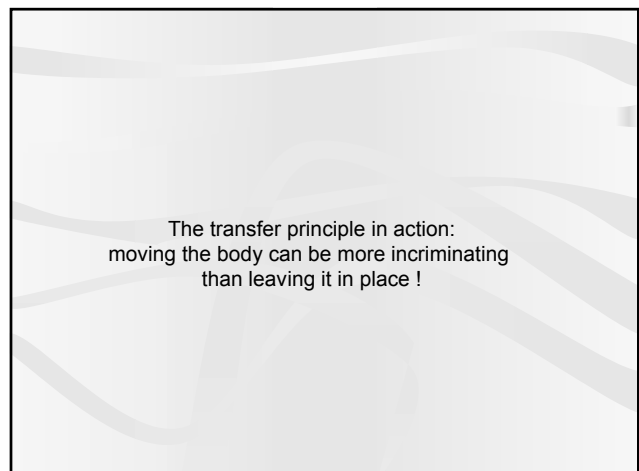
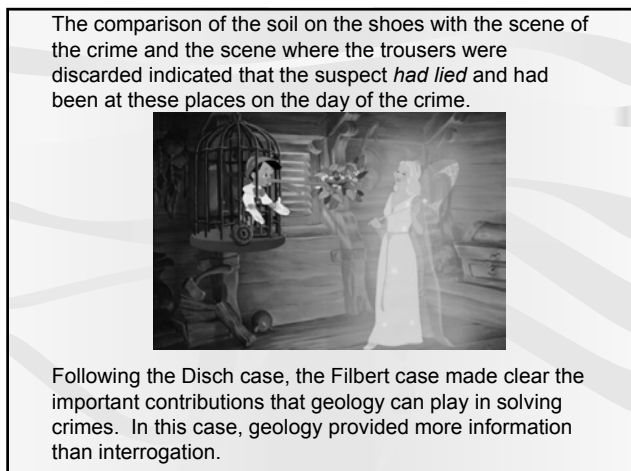
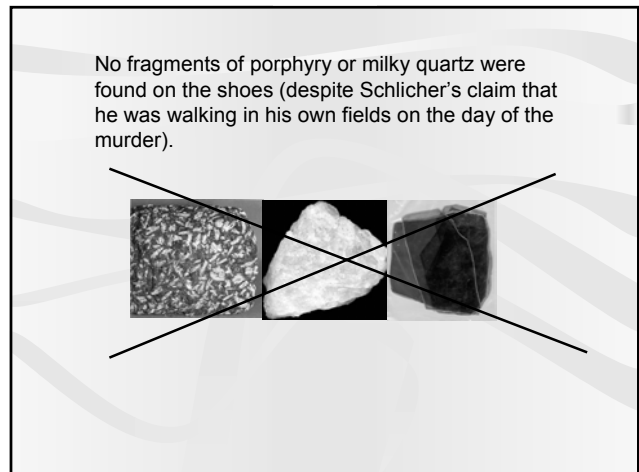
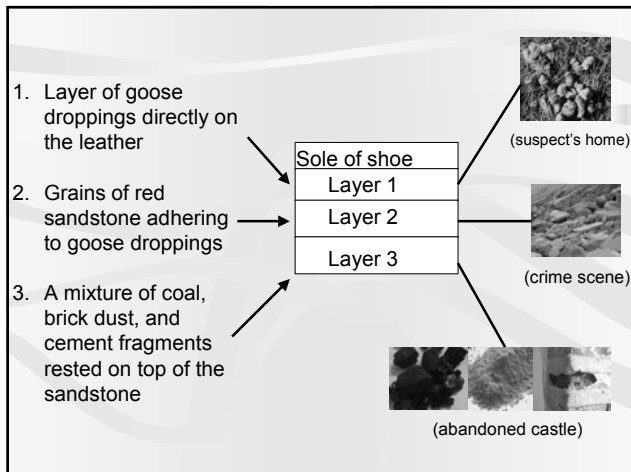
red clay

Remember that the shoes were only worn during the day of the murder (although Schlicher denied any part in the crime). This provided a narrow window during which all soil on the shoes accumulated.

Using the principle of superposition, Popp reconstructed the order of Schlicher's activities on that day.

The first layer was deposited directly on the leather of the shoe sole, with subsequent layers deposited sequentially.

Leather sole of shoe	
Layer 1	Deposited first
Layer 2	
Layer 3	
	Deposited last



New Jersey Gun Range Case

In 1975, an exhumed, unembalmed body was discovered one morning in a common green plastic garbage bag on a police gun range in Linden, New Jersey.



The only evidence that could be used to tie the body to the original site of burial was soil found in the bag with the body.

The soil examined was compared to soil maps of the surrounding area, permitting location of the burial site.

The site where the body was originally buried had distinctive characteristics that indicated that the soil material was landfill material dredged from a nearby bay.



This information, together with information obtained from informants, the original burial site was located under the front porch of a family home built on landfill of the said material.

It was later determined that a mother and daughter had murdered the father and buried him under their front porch.



Panicked by the foul odour generated by the rotting of the body, the mother and daughter dug up the body and deposited the body in the only wooded area in town- the police pistol range.



Were it not for soil evidence, it is unlikely that the scene of the crime would have been discovered.

Camarena Case

U.S Drug Enforcement Administration agent Enrique “Kiki” Camarena disappeared in 1985.



Camarena's body was later discovered in Michoacan state, Mexico.



Mexican government, asking U.S. officials why the loss of a single agent was of major concern, raised suspicions that Mexican officials were hiding something.

A full investigation was launched.

FBI requested samples of soil found associated with the body remains and soil at the site where the body was discovered.

Camarena's body was found in a badly decomposed state, the body fluids having become thoroughly intermixed with soil material, which included fragments of vesicular volcanic ash and rhyolite (felsic igneous rock), as well as burnt plant material.



In contrast, the soil samples collected at the site where the body was discovered contained black, basaltic glass (mafic igneous rock).

It became obvious that the body had been moved from its original site of burial.



The mineralogy of the felsic grains indicated that the body must have been buried in the general vicinity of the El Tequila ash flow in the Guadalajara Basin approximately 100 km to the north of the final burial site.



Eventually, the search was narrowed to a more specific site where the mineralogical and textural characteristics of the soil (plus the charred plant remains) matched the soil found adhering to the body.



Cadaver dogs were eventually employed to pinpoint the original burial site. Not surprisingly, the soil samples taken from this site matched those obtained from the body.

Soil evidence added significantly to the large body of evidence gathered on conspiratory actions accomplished between drug traffickers and the Mexican Police to cover up the murder of agent Camarena.

It later surfaced that the Mexican Federal Judicial Police, pressured by the U.S. government to investigate the murder of Camarena, made arrangements with drug traffickers to relocate the body to its eventual site at a farm in Michoacán.

The Mexican Federal Judicial Police then ransacked the farm, claiming that the killed occupants were the individuals responsible for Camarena's demise.

It was later determined that Camarena was killed by blunt force injuries to the head.

Several trials later, major players in the murder of Camarena were ultimately convicted (including major drug lord Rafael Caro Quintero).

