

In Corporate Crimes, Paper Trail Often Leads to Ink Analysts' Door

Mightier Than Broker's Word, 2 Ballpoints Could Help Land Martha Stewart in the Pen

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Will Martha Stewart be undone by a blue ballpoint pen?

In the case against Ms. Stewart, a key piece of evidence is a tiny, handwritten notation made by her stockbroker on a trading worksheet filled with similar scribbles. Prosecutors claim the broker belatedly inserted the note to help cover up Ms. Stewart's improper stock trading. Their support: Laboratory analysis showing that the blue ballpoint ink he used is different from ink elsewhere on the document.

Forensic ink analysis, a little-known crimefighting tool, is suddenly in the spotlight in several high-profile business scandals. In Harrisburg, Pa., federal prosecutors pursuing accounting fraud at Rite Aid Corp. used ink analysis to help show that certain documents were backdated. And in San Francisco, the CEO of Aptix Corp. has been indicted on federal charges that include perjury, after ink analysis and other evidence indicated he had fabricated a notebook to help win a patent lawsuit. He has pleaded not guilty.



Scrutinizing ink is on the rise, in large part, because investigators are spending more time chasing corporate officials for crimes that can be difficult to prove or that are mind-numbingly complex. In many cases, it can be easier to

"The issue in a lot of these white-collar cases isn't the substantive offense," says Nick Theodorou, a former federal prosecutor now at Foley Hoag LLP in Boston. "It's when they panic, especially control freaks, and they alter things. That's when you get into obstruction-of-justice problems."

Ms. Stewart and Mr. Bacanovic have pleaded not guilty. Ms. Stewart's attorney declined to comment. Mr. Bacanovic's attorney, Richard Strassberg, said, "Mr. Bacanovic did nothing wrong and that will be proven at trial."

Most of the ink analysis for the federal government -- including analysis in the Rite Aid case -- is done by the U.S. Secret Service's Forensic Services Division, which maintains the world's largest library of ink samples with more than 7,000 entries. In addition, the handful of private experts around the country who do ink analysis, mostly for medical malpractice suits, patent battles, or cases involving disputed wills.

To identify a particular type of ink, scientists typically use a technique called thin-chromatography. A tiny sample of ink is removed from the paper using a hypodermic needle, then dissolved in a solution and applied to a thin plate. The plate is put through a process in which the component dyes start to separate.

Albert H. Lyter III, an ink expert in Raleigh, N.C., says a complicated ink can be made up of as many as seven or eight different dyes, although a typical one has just three or four common ones, the most common being Methyl Violet and Victoria Blue. There are at least 100 different dyes, from a red-tinted rhodamine family to gray-hued nigrosine.

After separating the dyes, scientists try to match the ink with known formulations. "Bic Corp.'s black pen is an easy one, because it contains only two main dyes that are commonly seen. Others can be trickier, he says, because certain ink formulas are very complex and even the best library doesn't contain every ink sample."

One early case in which ink science played a role was the 1973 conviction of mass murderer Juan Corona, who hacked to death 25 migrant workers near Yuba City, Calif. Although Corona denied involvement in the killings, a key piece of evidence was a ledger book listing the names of seven victims found in Mr. Corona's home. Richard Brunelle, an ink analyst then working for a predecessor to the Secret Service lab, recalls that he was able to match the ink in the ledger to a pen found in Mr. Corona's possession.

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Last month, just before he was to face trial, Mr. Grass pleaded guilty to two consp including obstruction of justice, and admitted his role in preparing the backdated l

In the Martha Stewart case, the analysis task was simpler -- differentiating between a single document. When investigators started asking questions about Ms. Stewart ImClone Systems Inc. shares just ahead of negative news, Ms. Stewart claimed the pre-existing arrangement with her broker, Mr. Bacanovic, to sell the shares if they \$60. To support that claim, prosecutors say, Mr. Bacanovic added a tiny "@60" be ImClone name on a worksheet on which he had previously jotted notes about plan Ms. Stewart's other holdings. The notation, prosecutors claim, was added sometime weeks after the trade.

Erich Speckin, of Speckin Forensic Laboratories in Okemos, Mich., says determining separate inks were used on the worksheet would be "one of the easiest things" for much more certain than identifying the particular inks used. Mr. Speckin doesn't know what test was used -- and the government isn't saying -- but he speculates that the government probably didn't use thin-layer chromatography, because the "@60" mark is so tiny that multiple samples would destroy the evidence. Instead, he suspects the government of infrared imaging. That test, he says, "would be definitive" if it showed a difference between the "@60" mark and others on the page.

A person close to the case says Ms. Stewart's lawyers are likely to press the government to prove that the notation was added later, not just that a different pen was used. This is possible because Mr. Bacanovic could have been interrupted when originally marking the document and had simply picked up a different pen. "What matters is the time period the pen," the person adds.

Mr. Speckin says ink analysis probably won't be able to help with that. Because ink spreads on paper slowly and various components evaporate at different rates, scientists can use various tests to date many ink samples. Mr. Speckin likens it to trying to remove a stain or dye from fabric. The longer it has been on, the less of it will come out. But Mr. Speckin says the tests are fine enough to differentiate between samples six months apart, not the five weeks alleged with Mr. Bacanovic's worksheet. (Ballpoint ink dries completely after several days, but the process doesn't work on older documents.)

Documents generated with inkjet printers can be scrutinized using the same techniques. Matching an ink sample to a particular printer is impossible, and even matching it to a printer can be impossible in some cases, because there are so many companies around.