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- INTELLIGENCE ALERT -

HEROIN IN BOOK BINDINGS IN FORT LAUDERDALE, FLORIDA

Photo 1

The Broward Sheriff's Office Crime Laboratory (Ft. Lauderdale, Florida) recently received two books entitled: "Mas Platon y Menos Prozac" (roughly: "More Support and Less Prozac").

Both books contained a rectangular chunk of compressed, brown colored powder (wrapped in clear plastic) in a cut-out area of their bindings, suspected heroin (see Photo 1, previous page). The books were mailed to a Fort Lauderdale address by an express delivery service, and were intercepted (and a controlled delivery performed) by the Broward Sheriff's Office. Analysis of the powder (total net mass 99.0 grams) by crystal testing and GC/MS confirmed heroin (quantitation not performed, but the analysis suggested high purity). This is the first time this smuggling technique has been encountered by the Crime Laboratory.

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- INTELLIGENCE ALERT -

OPIUM-"STARCHED" BLANKET IN FITCHBURG, MASSACHUSETTS

The Massachusetts State Police Crime Laboratory (Sudbury, Massachusetts) recently received an unusual two-part submission consisting of a black blanket/sheet, measuring approximately 32 inches by 70 inches, folded in half and inserted into a multi-print fabric sleeve, measuring approximately 28 inches by 40-1/2 inches (see Photos 2 and 3), suspected to be opium-laced. The exhibit (total net mass 834 grams) was originally seized by the U.S. Customs Service in Hawaii, and was subsequently control delivered to a residence in Fitchburg (central Massachusetts), then submitted to the Crime Laboratory by a local Drug Task Force. Analysis of extracts of the black blanket/sheet by GC and GC/MS indicated the presence of opium, confirming codeine, morphine, thebaine, papaverine, and noscapine (quantitation not performed). This was the Crime Laboratory's first encounter with an opium-laced blanket/sheet.

Photo 2

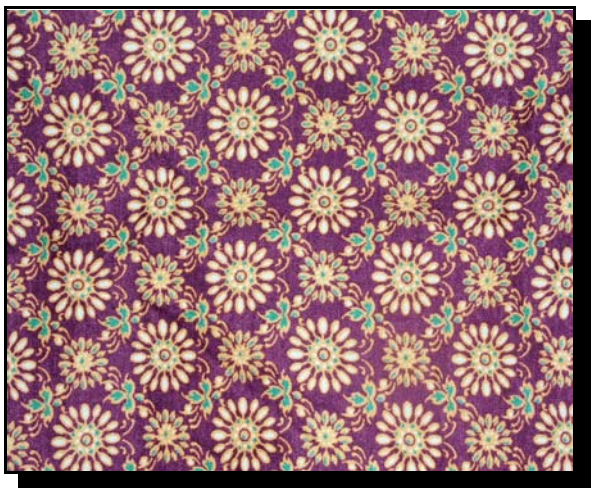

Photo 3

[Editor's Notes: According to the analyst, the controlled delivery was made to an elderly individual of southeast Asian descent. Smuggling of opium "starched" into cloth has been previously reported in *Microgram* in the mid-1980's (twice), but is not a commonly used technique - probably because opium has a fairly pronounced odor which is difficult to either disguise or conceal.]

- INTELLIGENCE ALERT -

CALIFORNIA OPIUM FIELD DISCOVERED IN NATIONAL FOREST

From the *Forensic Drug Abuse Advisor* 2003;15(7):53

[Editor's Preface: This Alert is provided in followup to the NDIC Brief that was reprinted in the August 2003 issue of *Microgram Bulletin*. Unclassified; Reprinted With Permission.]

Everyone knows about the Barbary Coast opium dens that operated in San Francisco during the 1890s, but it came as a great surprise to officials when, in mid-June, when a hiker stumbled upon a nearly two acre field of 1-to-3 foot tall lavender opium poppies. When the hiker returned with a forest ranger, they discovered 40,000 opium poppies growing in the Sierra National Forest, 35 miles northeast of Fresno. They also discovered three men in camouflage suits who were scoring the poppies in preparation for harvesting the opium latex. They ran away and were not caught. U.S. Forest Service officials said this is largest crop of the narcotic- producing plants they have ever found in California. Agents from the U.S. Drug Enforcement Administration say that people in the heroin and opium trade may be following in the footsteps of marijuana growers, who in the past 10 years have set up multimillion-dollar plantations in remote areas of national parks and forests across the state. Those farms, some believed to be financed by Mexican drug cartels, often are guarded by armed men, posing a danger to hikers and hunters who wander off designated trails.

According to Forestry service spokesman, there was no sign that anyone was living on the poppy plantation (someone usually sticks around to keep an eye on marijuana plantations). The poppies had been planted on a south-facing slope that had been cleared of vegetation by a fire in 2001. All the plants have been cleared and are being analyzed in a DEA laboratory.

The 40,000 confiscated plants could have produced approximately 40 pounds of raw opium or 4 pounds of heroin. According to the DEA spokesman, a pound of heroin sells wholesale for between $16,000 and $18,000 [See Editor's Notes, next page]. He also indicated that at retail, [heroin] goes for between $50 to $100 a gram. Taylor said the DEA doesn't know what opium sells for today, but in 1999 it could go for as much as $15,000 a pound. In the United States it has been illegal to grow opium poppies since 1932.

A DEA spokesman said agents were aware of opium being imported into Fresno and Sacramento from Southeast Asia, and that there had also been some reports of some individuals in the Central Valley smoking opium in pipes or inhale the fumes from a tin foil. The practice, long known in China as "chasing the dragon" appears to have finally arrived in the United States.

California is not the only place where opium production is on the rise. According to a United Nations survey, 2003 saw one of the best Afghan opium harvests ever. Production has been rising ever since the ouster of the Taliban. This year Afghanistan is again expected to be the world's No. 1 producer of opium with a harvest of more than 4,000 tons, enough to produce 400 tons of pure heroin.

[Editor's Notes: The quoted prices for heroin in the above Intelligence Brief are a little low. Current west-coast prices for black tar heroin are running between $15,000 - $65,000 per kilo ($6,800 - $29,500 per pound), whereas east coast prices for "white" heroin are running $60,000 - $85,000 per kilo ($27,300 - $38,600 per pound).]

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- INTELLIGENCE ALERT -

COCAINE INSIDE A LARGE CANDLE IN NORFOLK, VIRGINIA

Photo 5

The DEA Mid-Atlantic Laboratory (Largo, Maryland) recently received a submission of a large scented, rectangular candle in a metal tin, suspected to contain concealed cocaine (see Photo 4). The candle (ca. 12 x 6 x 3.5 inches) had three wicks and a very strong mulberry-like scent. It was seized by the Norfolk Police at a local FedEx distribution center (point of origin not reported). The cocaine was in the shape of a brick and was wrapped in several layers of plastic and rubber, which was in turn embedded within the wax. Recovery required cutting the metal container off the candle, then chiseling the wax off the package. Analysis by GC/FID and FTIR-ATR confirmed 81 percent cocaine hydrochloride (total net mass 974.9 grams). Although the Mid-Atlantic Laboratory has previously received cocaine in candles, this was the first encounter with a large candle in a metal tin.

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- INTELLIGENCE BRIEF -

40 YEAR OLD PSILOCYBIN TABLETS IN MENDOCINO COUNTY, CALIFORNIA

The State of California, Bureau of Forensic Services Laboratory (Eureka, California) recently received an interesting polydrug submission from Mendocino County (about 110 miles north of San Francisco), including cocaine powder (1.08 grams), dimethyltryptamine (DMT, compressed powder, 0.07 grams), an MDA capsule (0.09 grams), an MDMA capsule (0.23 grams), methamphetamine (0.49 grams), methaqualone tablets (two standard Lemmon 714 logo tablets), psilocybin mushrooms (36.01 grams), and psilocybin tablets (six, single scored, in very fragile condition). The exhibits were seized by the Mendocino County Sheriff's Office (circumstances not reported); analysis was done with a variety of color tests and GC/MS. The submission had a number of unusual aspects - the DMT powder was highly compressed, had a strong mothball

odor (not further identified), and had the appearance of amber (see Photo 5), the MDA and MDMA were both present in clear gelatin capsules, methaqualone tablets hadn't been seen by the laboratory in years, and the psilocybin tablets were in what appeared to be the original packaging (glass bottle with metal screw on lid, labelled: "Sandoz Pharmaceuticals, 50 tablets, Psilocybin, each tablet contains 10 mg, Research Material") (see Photo 6). According to the Drug Identification Bible, 2002, these tablets were manufactured between 1958 and 1965. GC/MS analysis of the psilocybin tablets showed minute traces of psilocin, with the major peaks being the tablet binders. None of the exhibits were quantitated. This was the laboratory's first ever encounter with psilocybin tablets.

Photo 5

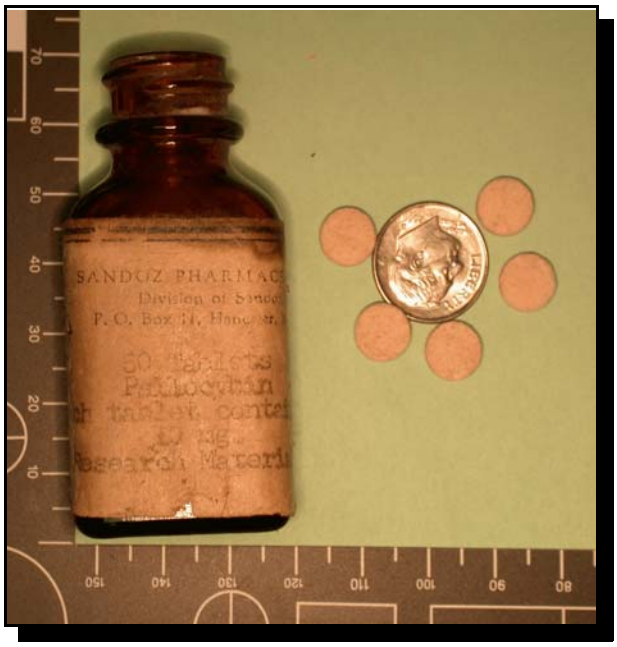

Photo 6

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- INTELLIGENCE BRIEF -

MIXED MDMA / *l*-METHAMPHETAMINE / KETAMINE TABLETS WITH THE MERCEDES-BENZ LOGO IN SAN JOSE, CALIFORNIA

The DEA Western Laboratory (San Francisco, California) recently received 985 light pink tablets imprinted with the Mercedes-Benz logo, suspected Ecstasy (see Photo 7). The exhibit was acquired in San Jose via an undercover purchase by the DEA San Jose Regional Office. Each tablet was approximately 8 millimeters in diameter and weighed 440 milligrams. Analysis by GC/MS and GC/IRD, however, indicated not only MDMA (43 milligrams/tablet , calculated as the hydrochloride salt) but also methamphetamine (11 milligrams/tablet, calculated as the hydrochloride salt) and ketamine (not quantitated, salt form not determined). Unusually, derivatization with TPC determined that the

Photo 7

methamphetamine was the *l*- isomer. This was the first submission to the Western Laboratory of this type of tablet; however, a second submission of similar tablets has since been received.

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- INTELLIGENCE BRIEF -

TFMPP AND BZP IN YPSILANTI, MICHIGAN

The DEA North Central Laboratory (Chicago, Illinois) recently received a submission of fine, white powders in capsules and plastic bags, composition unknown (photos not taken). The exhibits were acquired in Ypsilanti by the DEA Detroit Field Division. The first exhibit (50 capsules) was purchased undercover, and was being sold as "Molly". The remaining five exhibits were seized from the defendant's residence. Two exhibits consisted of clear, oblong, capsules (approximately 21 millimeters in length), each filled with varying amounts of the powder. The remaining four exhibits consisted of bags of the powder. Analyses by color tests, GC/MS, FT-IR, NMR, and GC/FID indicated either 1-(3-trifluoromethylphenyl)piperazine (TFMPP, calculated as the hydrochloride salt), or a mixture of TFMPP and 1-benzylpiperazine (BZP, calculated as the hydrochloride salt). The capsules contained only TFMPP, at 178 milligrams/capsule (14.1 grams net in 50 capsules) and 106 milligrams/capsule (11.9 grams net in 57 capsules), respectively. Two of the bags also contained only 91 percent TFMPP (500.4 grams and 124.0 grams, respectively). The remaining two bags contained, respectively, 85 percent TFMPP and 7.3 percent BZP (20.7 grams), and 30 percent TFMPP and 57 percent BZP (15.5 grams). The defendant claimed to have purchased both compounds over the Internet before they were controlled. TFMPP and BZP have been identified numerous times at the North Central Laboratory.

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- INTELLIGENCE BRIEF -

LARGE MDMA SYNTHESIS LABORATORY AND TABLETTING OPERATION SEIZED IN SCARBOROUGH, ONTARIO, CANADA

The DEA Special Testing and Research Laboratory's Source Determination Program (Dulles, Virginia) recently received a small selection of tablets and digital photographs of a large number of tablet punches from an operational Ecstasy tabletting operation in Scarborough, Ontario, Canada. The laboratory was seized by the Royal Canadian Mounted Police (RCMP) in cooperation with several other Canadian police agencies. A separate synthesis laboratory was also seized nearby (details on the synthesis route not available). In all, 147 punches, about 200,000 tablets, and sufficient MDMA powder to manufacture an additional 100,000 tablets were seized (total net masses of tablets and powder not reported). Analysis of the forwarded tablets indicated various mixtures of caffeine, methamphetamine, amphetamine, MDMA, GHB, ketamine, and acetaminophen. Photographs of twenty of the more interesting tablet punches are shown on the next two pages. This is believed to be the largest and certainly most varied MDMA tabletting operation ever seized in North America.

[Additional comments from the Source Determination Program: Although sometimes overlooked by personnel seizing clandestine laboratory sites, tablet punches can be extremely useful evidence. Detailed toolmark analysis on both tablets and seized tablet punches can potentially link them to many other cases featuring the same tablets made by the same punches. This information can then be used in court to show the duration and extent of a clandestine operation, that is, approximately how long the laboratory was in operation, the kinds of drugs used in various batches of the tablets (and how they changed over time), and the approximate geographical distribution of the tablets. This information can assist in the successful prosecution of conspiracy cases.]




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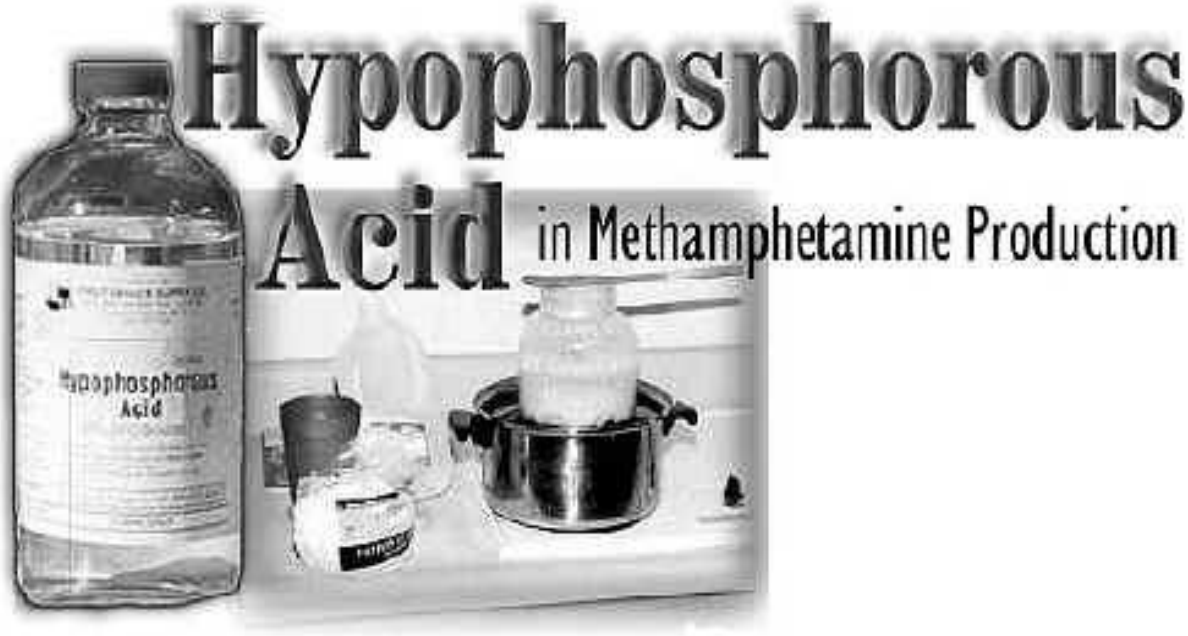
Selected Intelligence Brief



National Drug Intelligence Center
319 Washington Street, 5th Floor
Johnstown, PA 15901

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[Unclassified; Reprinted With Permission]

Overview

Hypophosphorous acid, which is used legally for a variety of commercial purposes, is a chemical that increasingly is substituted for red phosphorus in the methamphetamine production process. The federal government regulates the sale of hypophosphorous acid through registration, record keeping, reporting, and import/export requirements regardless of the quantity being handled or distributed. Although hypophosphorous acid is a List I chemical under the Controlled Substances Act, methamphetamine producers typically purchase the chemical via the Internet or from associates who also are engaged in methamphetamine production. The use of hypophosphorous acid in methamphetamine production is an extremely dangerous practice because of the deadly gases that can be generated as well as the risk of fire or explosion.

Characteristics and Availability

Hypophosphorous acid (H3PO2, also called phosphinic acid) is a strong acid that typically is prepared as a solution of colorless, oily liquid in strengths of 50 percent, 30 to 32 percent, and 10 percent. It also is prepared in the form of salts (referred to as hypophosphite salts), particularly ammonium hypophosphite,

calcium hypophosphite, iron (ferric) hypophosphite, magnesium hypophosphite, manganese hypophosphite, potassium hypophosphite, and sodium hypophosphite.

Over 100 chemical firms located throughout the world produce hypophosphorous acid. The People's Republic of China and India have the largest numbers of hypophosphorous acid producers, although there are a few producers in the United States. There are a wide variety of uses for hypophosphorous acid and its salts in commercial industry; however, the chemicals have no legitimate household or retail uses. The legitimate commercial and laboratory fields that use hypophosphorous acid and its salts include the following:

• Chemical plating

• Food preparation

• Water treatment

• Polymers (as a bleaching agent, color stabilizer, or catalyst)

• Education and research in analytical chemistry

Chemical suppliers typically distribute hypophosphorous acid in large quantities, for example, in drums containing 275 pounds of the diluted solution. Hypophosphorous acid also is distributed in smaller quantities. One-half liter of 50 percent concentrate hypophosphorous acid solution can be obtained from chemical suppliers for as little as $14. Methamphetamine laboratory operators typically obtain small quantities of the chemical from other laboratory operators who purchase large quantities of the chemical and repackage it for further distribution. According to law enforcement sources, these individuals sell hypophosphorous acid for as much as $1,000 per half-liter. Methamphetamine laboratory operators also purchase hypophosphorous acid via the Internet. (See expansion below.)

Hypophosphorous Acid and the Internet

The Internet is a source of a great deal of information regarding hypophosphorous acid. Popular Internet sites that disseminate information about illicit drugs contain information about the chemical, including numerous recipes for home production of methamphetamine using hypophosphorous acid. There also are recipes for synthesizing hypophosphorous acid from available chemicals. Hypophosphorous acid solutions and salts have been sold to the general public via the Internet. The Drug Enforcement Administration (DEA) has strong concerns regarding the sale of chemicals on the Internet and has requested that any sites (such as auction sites) that allow the sale of regulated chemicals on their domains require proof of DEA registration from their clients.

Hypophosphorous Acid Used in Methamphetamine Production

Hypophosphorous acid is used in the ephedrine/pseudoephedrine reduction method of methamphetamine production. (See NDIC Information Brief Methamphetamine Production Methods, A Guide for First Responders, April 2003.) It is used in the methamphetamine production process to produce hydriodic acid, an important reagent (it reacts with the ephedrine/pseudoephedrine but does not become part of the finished product). The regulation of hydriodic acid by DEA in 1993 rendered it virtually unavailable in the United States. However, methamphetamine laboratory operators discovered methods to produce

hydriodic acid using a combination of iodine in water with red phosphorus. Laboratory operators found that red phosphorus could be obtained easily, either from commercial supply companies or by scraping the striker pads from matchbooks or matchboxes. Methamphetamine producers soon discovered that hypophosphorous acid also could be used in combination with iodine and water to produce hydriodic acid.

The practice of using hypophosphorous acid in methamphetamine production is believed to have begun in the United States in the late 1990s when a methamphetamine producer in Colorado obtained the recipe from Australia, where the hypophosphorous acid method is prevalent. This man was known as a serial cook who had a long history of methamphetamine production. Over several years he trained other laboratory operators in Colorado to produce methamphetamine using hypophosphorous acid. As his techniques were passed on to others, the number of methamphetamine laboratories in Colorado using hypophosphorous acid continued to increase, and the technique was passed on to numerous methamphetamine producers in other states.

According to the El Paso Intelligence Center (EPIC) National Clandestine Laboratory Seizure System, from 2000 through 2002 the number of seized methamphetamine laboratories in the United States in which hypophosphorous acid was found increased overall. (See Table 1.)

Table 1. Methamphetamine Laboratories With Hypophosphorous Acid Present, 2000-2003

Year	Total	Top 3 States
2000	89	California, Colorado, Nevada
2001	107	Colorado, Mississippi, Oklahoma
2002	102	Colorado, Missouri, Oklahoma
2003 (as of 3/31/02)	36	Colorado, Kansas, Oklahoma

Source: El Paso Intelligence Center National Clandestine Laboratory Seizure System.

Hypophosphorous acid found at methamphetamine laboratories is packaged in a variety of ways. The chemical has been found in 1-gallon bottles of solution or in 1-pound jars of salts. Some hypophosphorous acid containers are labeled as "plating solution." Pint-sized brown glass bottles wrapped in red electrical tape also have been found to contain hypophosphorous acid; they have been discovered primarily in Colorado.

The vast majority of hypophosphorous acid found at laboratory sites has been recovered from small toxic laboratories (STLs), those which yield gram to ounce quantities per production cycle. Hypophosphorous acid has not been reported at large-scale laboratories operated by Mexican criminal groups in the United States.

Hazards

The iodine/hypophosphorous acid method is more hazardous than the iodine/red phosphorus method although the reaction using hypophosphorous acid is faster and gives slightly higher yields.

When hypophosphorous acid is used, the chemicals must be mixed together slowly in a particular order to prevent them from reacting violently. The combination of hypophosphorous acid with the other chemicals and with certain metals can produce deadly phosphine gas during the initial mixing step and can continue to produce phosphine gas for several days after production has been completed. The iodine/hypophosphorous acid mixture has a tendency to decompose quickly when overheated or if heated for long periods of time, becoming cloudy or "milky-white" just prior to giving off a cloud of phosphine gas that can ignite spontaneously. Hypophosphorous acid solutions may become unstable if evaporation results in concentrations above 50 percent.

[Note: Law enforcement or emergency personnel who encounter suspected containers of hypophosphorous acid should use extreme care during handling because laboratory operators often attempt to obtain a more concentrated acid by allowing water to evaporate from the mixture.]

Because hypophosphorous acid often is used at small methamphetamine laboratories operated by inexperienced or careless individuals, the potential hazards of using this method are even greater. The risk of fire and explosion is higher in these laboratories, where professional laboratory equipment typically is not used to contain the phosphine gas and where safe handling precautions are not employed. In addition, these laboratories often are located in homes where children are present and may come into contact with hypophosphorous acid. A child can easily mistake hypophosphorous acid for any other clear liquid, particularly if it is stored in household containers or drinking glasses. Skin, eye, or inhalation exposure can be extremely harmful or fatal.

Safety Precautions

- Always wear a self-contained breathing apparatus as well as protective clothing when entering areas where hypophosphorous acid may be present.

- When in contact with metals or in a high-temperature environment, hypophosphorous acid can break down and liberate phosphine and flammable hydrogen gas. Do not allow the use of open flames, open lights, matches, or smoking in or around laboratories or dumpsites where hypophosphorous acid is handled.

- In case of fire, use a self-contained positive pressure breathing apparatus and full protective equipment. Use water spray, fog, foam, dry chemicals, or other reagents as may be appropriate for materials in the surrounding fire.

- Water may be used to cool the containers of hypophosphorous acid; however, use extreme care to avoid allowing water to enter the container.

- In case of spills, neutralize the spilled chemical with alkaline material (soda ash, lime), then absorb it with an inert material such as vermiculite, dry sand, or earth and place in a chemical waste container. Do not use combustible materials such as sawdust.

Legislation and Control

In the United States hypophosphorous acid is one of 38 chemicals (or groups of chemicals) controlled under law by DEA. On October 17, 2001, hypophosphorous acid and its salts, along with red and white phosphorus, were officially added as List I chemicals under section 1310 of the Code of Federal Regulations. List I chemicals are defined as chemicals that are used in the manufacture of a controlled substance in violation of the Controlled Substances Act (CSA) and are important to the manufacture of a controlled substance. Under the law, suppliers are required to maintain records and report receipts, sales,

imports, and exports of these chemicals to DEA. Hypophosphorous acid, red phosphorus, and white phosphorus, as well as ephedrine, are unique in that suppliers are required to report all transactions of these chemicals, regardless of the amount. By contrast, the other 34 listed chemicals are only reportable after a supplier's transactions for a chemical reach an established weight or volume threshold in a calendar month.

In addition to reporting all transactions involving the chemical, suppliers are expected to "know their customers" in order to prevent the diversion of these substances to methamphetamine laboratories, as it is illegal to import, export, purchase, or sell hypophosphorous acid or any other listed chemical in the United States if it is used or intended to be used in the production of a controlled substance. Chemical suppliers are held liable for selling listed chemicals if they know or suspect that the chemical will be used for illicit purposes.

Outlook

The use of hypophosphorous acid in the production of methamphetamine is likely to increase, particularly in the Midwest and Southwest regions of the United States where methamphetamine production is prevalent. Injuries, property damage, and deaths also will increase as a growing number of inexperienced methamphetamine producers experiment with hypophosphorous acid.

[Editor's Note: The above referenced NDIC Intelligence Brief entitled: "Methamphetamine Production Methods, A Guide for First Responders" (April 2003) is a law enforcement restricted publication.]

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SELECTED REFERENCES

[Note: Selected references are a compilation of recent publications of presumed interest to forensic chemists. Unless otherwise stated, all listed citations are published in English. If available, the email address for the primary author is provided as the contact information. Listed mailing address information (which is sometimes cryptic or incomplete) exactly duplicates that provided by the abstracting services.]

1. Laing RR. **Hallucinogens: A forensic drug handbook.** Elsevier Science Ltd.: London, UK, 290 pp. [Editor's Note: No abstract or contact information provided.]

2. Schneider RC, Kovar K-A. **Analysis of ecstasy tablets: Comparison of reflectance and transmittance near infrared spectroscopy.** Forensic Science International 2003;134(2-3):187. [Editor's Notes: Presents analyses of mixed composition tablets by the title techniques; transmittance mode was found to be better than reflectance mode. Contact: Pharmaceutical Institute, Department of Pharmaceutical Analysis, University of Tubingen, Auf der Morgenstelle 8, Tubingen 72076, Germany.]

3. Kochana J, Wilamowski J, Parczewski A, Surma M. **Synthesis of standards of the most important markers of Leuckart p-methoxymethamphetamine (PMMA). Examination of the influence of experimental conditions and a drug diluent on SPE/TLC profiling.** Forensic Science International 2003;134(2-3):207. [Editor's Notes: Presents syntheses of characteristic markers for Leuckart-synthesized PMMA, and their use in SPE/TLC analyses. Contact: Faculty

of Chemistry, Department of Analytical Chemistry, Jagiellonian University, Ingardena 3, Krakow 30-060, Pol.]

4. Kochana J, Wilamowski J, Parczewski A. **Profiling of impurities in p-methoxy-methamphetamine (PMMA) by means of SPE/TLC method. Examination of the influence of experimental conditions according to 2^4 factorial.** Forensic Science International 2003;134(2-3):214. [Editor's Notes: Presents a profiling study of Leuckart-synthesized PMMA, using SPE/TLC. Contact: See Abstract #3 above.)

5. El-Haj BM, Al-Amri AM, Hassan MH, Ali HS, Bin Khadem RK. **The use of cyclohexanone as a "derivatizing" reagent for the GC/MS detection of amphetamines and ephedrines in seizures and the urine** [sic]**.** Forensic Science International 2003;135(1):16. [Editor's Notes: Uses cyclohexanone as the injection solvent, resulting in condensation in the injection port. The authors claim superior performance versus acyl and TMS derivatization. Contact: Sharjah Police Science Laboratory, P.O. Box 29, Sharjah, United Arab Emirates.]

6. Inoue H, Kanamori T, Iwata YT, Ohmae Y, Tsujikawa K, Saitoh S, Kishi T. **Methamphetamine impurity profiling using a 0.32 mm i.d. nonpolar capillary column.** Forensic Science International 2003;135(1):42. [Editor's Notes: The presented method allows for determination of 24 different characteristic starting materials and manufacturing byproducts. Contact: National Research Institute of Police Science, 6-3-1, Kashiwanoha, Kashiwa-shi, Chiba 277-0882, Japan.]

7. Kelly T, Doble P, Dawson M. **Chiral separation of methadone, 2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP) and 2-ethyl-5-methyl-3,3-diphenyl-1-pyrroline (EMDP) by capillary electrophoresis using cyclodextrin derivatives.** Electrophoresis 2003;24(12-13):2106. [Editor's Notes: Presents a stereoselective method for the simultaneous determination of methadone and its two principal metabolites. Contact: Centre for Forensic Science, Faculty of Science, University of Technology, Sydney (UTS), Sydney, Australia.]

8. Shirota O, Hakamata W, Goda Y. **Concise large-scale synthesis of psilocin and psilocybin, principal hallucinogenic constituents of "Magic Mushroom"** [sic]**.** Journal of Natural Products 2003;66(6):885. [Editor's Notes: The title study is presented. Contact: shirota@nihs.go.jp]

9 Meng Z-Y. **Properties of a newly produced hypnotic "Imovane" and its determination.** Guangpu Shiyanshi 2003;20(3):471. [Editor's Notes: Presents HPLC and GC-MS data for the title compound (principal component is Zopiclone). This article is written in Chinese. Contact: Department of Police Techniques, Liaoning Policeman College, Dalian, Liaoning 116038, Peop. Rep. China.]

Additional References of Possible Interest:

1. Kulikowska J, Sybirska H. **Forensic toxicological practice in the light of the availability of drugs of abuse.** Z Zagadnien Nauk Sadowych 2002;50:78. [Editor's Notes: Presents a survey of illicit drug involvement in sudden deaths in Poland from 1997 - 2001. Includes a survey of the makeup of about 2,500 samples of illicit drugs. This article is written in English and Polish. Contact: Chair and Department of Forensic Medicine, Silesian Medical Academy, Katowice, Pol.]

2. McCooeye M, Ding L, Gardner GJ, Fraser CA, Lam J, Sturgeon RE, Mester Z. **Separation and quantitation of the stereoisomers of ephedra alkaloids in natural health products using flow injection-electrospray ionization-high field asymmetric waveform ion mobility spectrometry-mass spectrometry.** Analytical Chemistry 2003;75(11):2538. [Editor's Notes: Presents a methodology for analysis of the ephedra alkaloids and their metabolites in OTC diet pills. Contact: Z. Mester, Natl Res Council Canada, Inst Natl Measurement Stand, Ottawa, ON, K1A OR6, Canada.]

3. Ichikawa M, Udayama M, Imamura K, Shiraishi S, Matsuura H. **HPLC determination of (+)-pseudoephedrine and (-)-ephedrine in Japanese herbal medicines containing ephedra herb using solid-phase extraction.** Chemical and Pharmaceutical Bulletin 2003;51(6):635. [Editor's Notes: Presents an SPE/HPLC methodology for analyzing various ephedra-based medications. Contact: M. Ichikawa, Wakanaga Pharmaceut Co Ltd, Inst Healthcare Res, 1624 Shimokotachi, Hiroshima 7391195, Japan.]

4. Reddy BM, Sreekanth PM. **An efficient synthesis of 1,5-benzodiazepine derivatives catalyzed by a solid superacid sulfated zirconia.** Tetrahedron Letters 2003;44(24):4447. [Editor's Notes: Presents a novel catalyst for synthesis of the title compounds. Contact: BM Reddy, Indian Inst Chem Technol, Inorgan & Phys Chem Div, Hyderabad 500007, Andhra Pradesh, India.]

5. Bazylak G, Nagels LJ, Monge ME. **Macrocycle versus podant-type neutral ionophore in potentiometric detection of mucolytic agents following separation by various HPLC modes.** Chromatographia 2003;57(11-12):757. [Editor's Notes: Presents a methodology for detection of clenbuterol (and other select lipophilic drugs) in oral formulations. Contact: G. Bazylak, Ludwig Rydygier Med Univ, Fac Pharm, Dept Drug Chem, Jagiellonska 13, PL-85067 Bydgoszcz, Poland.]

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THE DEA FY - 2003 AND FY - 2004 STATE AND LOCAL FORENSIC CHEMISTS SEMINAR SCHEDULE

The remainder of the FY - 2003 schedule for the DEA's State and Local Forensic Chemists Seminar is as follows:

September 15 – 19, 2003

The FY - 2004 schedule is as follows:

December 8 - 12, 2003
February 9 - 13, 2004
April 19 - 23, 2004
June 14 - 18, 2004
September 20 - 24, 2004

Note that the school is open only to forensic chemists working for law enforcement agencies, and is intended for chemists who have completed their agency's internal training program and have also been working on the bench for at least one year. There is no tuition charge for this course. The course is held

at the AmeriSuites Hotel in Sterling, Virginia (near the Washington/Dulles International Airport). For additional information, eligibility requirements, or to enroll, call 703 668-3337.

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EMPLOYMENT OPPORTUNITIES

1. Indian River Crime Laboratory (Third and Final Posting)
Position: Forensic Chemist
Location: Fort Pierce, Florida
Salary: $45,000 – $60,000, Depending on Experience
Application Deadline: Open Until Filled

Duties: Responsibilities include the analysis of controlled substances; interpretation of laboratory analyses and results; preparation of written reports; and the ability to testify as an expert witness.

General Requirements: The applicant must be skilled in using gas chromatography, mass spectroscopy, ultraviolet and infrared spectrophotometry and other drug analysis equipment and methodologies. A familiarity with the technical and safety requirements of ASCLD-LAB, and demonstrated proficiency testing in controlled substance analysis are required. A Master's degree in chemistry or forensic science (with chemistry undergraduate degree) and two years of forensic laboratory experience are preferred. Experience in head-space BAC analysis is desirable. An extensive background investigation is required, and laboratory personnel are subject to random drug testing. EEO.

Application Procedure: Applications may be obtained on-line at www.stluciesheriff.com or by contacting:

Saint Lucie County Sheriff's Office
Human Resources Department
4700 W. Midway Road
Fort Pierce, Florida 34981-4825
Phone: (772) 462-3206
Fax: (772) 462-3218

For information about the position, contact:

Daniel C. Nippes
Chief Criminalist
Indian River Crime Laboratory
2502 S. 35th Street
Fort Pierce, Florida 34981
dnippes@ircc.edu
Phone: (772) 462-4765

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2. Houston Police Department (Second Posting)
Position: Crime Laboratory Director
Location: City of Houston, Texas
Salary Range: $92,066 - $100,000 Annually, Dependant on Qualifications
Application Deadline: Open Until Filled

Duties: Manages the daily operations of the Crime Laboratory, including DNA Analysis, Serology, Toxicology, Drug Identification, Trace evidence analysis, Firearms/Toolmark Examination and evidence registration; will serve as Crime Laboratory Director; hires, supervises and evaluates staff of fifty (50) persons; prepares, administers and monitors division budget; ensures compliance with all federal, state and local laws and regulations regarding physical evidence; oversees development and implementation of standard forensic testing practices and procedures for all sections of Crime Laboratory in accordance with standards set forth by ASCLD-LAB or other appropriate accrediting entity to achieve and maintain laboratory accreditation; plans and implements programs to ensure quality control of laboratory including the generation and storage of laboratory case reports and records; reviews reports and documents concerning evidence analysis and findings; plans directs and oversees the continuous training for all aspects of forensic laboratory services to keep Criminalists up-to-date with all methods of

forensic work; works with Investigative Division supervisors to develop protocols for prioritizing laboratory services usage; coordinates division operations with outside agencies and other government agencies; provides physical evidence information to law enforcement agencies, attorneys, judges, the District Attorney's Office and other scientific professionals; reports to an Assistant Chief; performs related duties as required.

Qualifications: Educational: Graduation from an accredited college or university with an Advanced Degree and major course of study in Criminalistics, Chemistry or any natural or physical science - or - graduation from an accredited four-year college or university with a major course of study other than one of the described sciences plus fifteen (15) or more years of increasingly complex forensic work experience in a crime laboratory. Experience: Seven (7) years progressively responsible Crime Laboratory experience including two (2) years supervisory experience in an accredited laboratory; or an equivalent combination of education and experience. License: Valid Texas Driver's License and compliance with city's policy on driving (AP 2-2).

Application Procedures: Original applications only are accepted and must be received by the Human Resources Department, at 611 Walker, First Floor, Houston, Texas, 77002.

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3. Hamilton County Coroner's Crime Laboratory (Second Posting)
Position: Drug Analyst
Location: Cincinnati, Ohio
Salary Range: $33,467.00 (Note: Hamilton County has an excellent retirement and benefits program.)
Application Deadline: Open Until Filled

Duties: Primary responsibility is to analyze and identify controlled substances using GC-MS, FTIR, and other analytical techniques. Analyst is required to present expert testimony in court. Staff members must comply with safety, quality control, technical and administrative procedures required by accrediting agencies. Analysts also routinely instruct law enforcement officers and other criminal justice professionals on matters relating to forensic science.

Qualifications: A BS/BA degree in forensic science or related natural science from an accredited college. Applicants must have completed an internship in a forensic laboratory. A strong background in mass spectrometry, pharmaceutical analysis, or analytical chemistry is desirable. Applicants must possess, or be able to obtain, a valid drivers license.

Application Procedures: Submit resume with cover letter to the contact listed below. Individuals selected for interviews are responsible for their own travel expenses.

William L. Dean
Chief of Forensic Sciences
Hamilton County Coroner's Crime Laboratory
3159 Eden Ave.
Cincinnati, Ohio 45219

Phone: 513-946-8755
E-mail: bill.dean@hamilton-co.org
Fax: 513-946-8772
Website: www.hamilton-co.org/coroner

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4. Broward County Sheriff's Office (BSO) (First Posting)
Position: Crime Laboratory Manager
Location: Fort Lauderdale, Florida
Salary Range: To Be Determined.
Application Deadline: Open Until Filled

Duties: This position directs, administers and manages all forensic services functions for the BSO. Critical functions under charge include the Crime Laboratory, Automated Fingerprint Identification System (AFIS), and Latent Identification. Employees in this classification maintain responsibility for the direction, and management of personnel engaged in latent and ten-print identification, audio/video enhancements, quality control/quality assurance, DNA analysis, firearms and tool mark identification, forensic chemistry, questioned documents examination, and trace evidence analysis.

Qualifications: A Master's degree in chemistry, biology, or another physical science is required; a Ph.D. is preferred. The

position also requires ten years experience that includes advanced forensic chemistry, biology or criminalistics preferably in a large national, state or regional laboratory. Thorough knowledge of DNA processing and American Society of Crime Laboratory Directors (ASCLD) certification required; certification by the American Board of Criminalistics (ABC) preferred. Experience in a managerial capacity with responsibility for administrative aspects of the work strongly desired.

Application Procedures: You may view a detailed job description, download an application or apply on-line at: www.sheriff.org. A completed application and accompanying resume will also be accepted by mail: Broward Sheriff's Office, Human Resources Bureau, 2601 W. Broward Blvd., Fort Lauderdale, FL 33312.

EOE M/F/D/V DFWP

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5. Ohio University (First Posting)
Position: Assistant/Associate Professor of Forensic Chemistry
Location: Athens, Ohio
Salary: [Not Listed]
Application Deadline: Open Until Filled

Duties: The Department of Chemistry and Biochemistry invites applications for a tenure-track position as an assistant/associate professor of forensic chemistry. We seek a chemist with postdoctoral or related experience and a research interest in forensic chemistry or related fields (toxicology, DNA typing, homeland security, etc.)

General Requirements: The successful applicant will be expected to have a Ph.D. in chemistry or a related field, and to establish a vigorous research program that will attract external funding. Candidates should be prepared to teach general chemistry as well as courses in their area of specialization at both the undergraduate and graduate (M.S. and Ph. D.) levels.

Application Procedure: Submit a curriculum vita, a research plan, a statement of teaching philosophy, and arrange to have at least three letters of recommendation sent to: Chair, Search Committee, Department of Chemistry and Biochemistry, Clippinger Laboratories, Ohio University, Athens, OH 45701-2979. Review of applications will begin on September 22, and will continue until the position is filled. Further information on the College of Arts and Sciences can be viewed at http://www.cas.ohiou.edu and on the position and the department at http://www.chem.ohiou.edu Minority and female applicants are especially encouraged to apply.

Ohio University is an Affirmative Action/Equal Opportunity employer.

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SCIENTIFIC MEETINGS

1. Title: American Academy of Forensic Sciences - 56th Annual Meeting (Second Posting)
Sponsoring Organization: American Academy of Forensic Sciences
Inclusive Dates: February 16 - 21, 2004
Location: Dallas, TX
Contact Information: [See website]
Website: [www.aafs.org]

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2. Title: 44th Annual International Drug Conference (Second Posting)
Sponsoring Organization: International Narcotic Enforcement Officers Association
Inclusive Dates: October 19 - 25, 2003
Location: Fort Lauderdale, FL (Wyndham Bonaventure Resort and Spa)
Contact Information: [None Listed]
Website: [None Listed]

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Computer Corner #174

Examiner Candidate Interview Strategies

by Michael J. Phelan
DEA Digital Evidence Laboratory

The hiring of a new examiner is one of the most important managerial tasks in a digital evidence laboratory – and is also considerably more challenging versus hiring in most other technical disciplines. The absence of formal computer forensics degrees from academia, the plethora of IT "certifications" from a wide variety of private industry sources (good, bad, and indifferent), and the lack of standardization of IT job titles, all significantly complicate the evaluation of perspective employees.

Advertisement

The first step should consist of an accurate and highly specific advertisement of the position. Key words such as computer forensics, digital evidence, or computer examination should be prominent. A detailed description of the scope of the work (stand-alone computers, networks, or electronic digital devices), required expertise (entry level, mid-level, or senior), and software tool familiarity should all be provided. Exact requirements eliminate inquiries and applications from (most) unqualified applicants.

Resume Review

The second step - review of resumes - is necessary to identify those candidates that merit further consideration, such as individuals with a strong IT background or previous experience in computer forensics.

The Interview Process

The third and most important step is the interview. Due to the aforementioned variability in qualifications, even the best looking candidates may actually just be "paper tigers". Experience at DEA has shown that the resume review process needs to be supplemented with an extensive and systematic interview to identify the actual breadth and depth of a perspective employee's knowledge and experience.

To assist in this process, DEA has developed a standard set of interview questions, consisting of two distinct sections. The first part consists of general IT questions that all perspective examiner personnel should know. A minimal grade for an entry-level position is 80%. The second part consists of questions reserved for those candidates who claim prior computer forensic experience. These questions probe these latter candidates' depth of knowledge, skills, and abilities. The candidate's answers are evaluated relative to the level that they are being considered for (such as a junior, mid-level, or senior position). It is unrealistic to assume that any candidate will know every answer. However, DEA has often been disagreeably surprised to discover that "apparently" well qualified interviewees with multiple IT credentials could not answer basic questions such as "what is a byte?" or "what is digital evidence?"

General IT Questions

DEA's general IT test is divided into several subject areas, including: computer hardware, computer operating systems, common software applications, computer networking, and general IT principles. Some sample DEA questions include: Explain the terms Master File Table, gigabyte, partition, POST, and Extended ASCII. What is a Master Boot Record? What are RAM, ROM, and CMOS? What is a thumb drive? What SCSI ID number is needed to boot a SCSI hard drive? What IDE pin number is usually associated with the color strip on the cable? What types of files have the following extensions – DLL, DOC, WPD, PST, XLS, WAV, DBF, and JPG? What is the approximate storage capacity of CDs, Zips, and diskettes? Explain the OSI model. Explain the typical usage of the following software – Eudora,

Quicken, PGP, Adobe Acrobat, Outlook Express, and Lotus Notes. Describe the date and time stamp information associated with modern Microsoft operating system files. What file structures are supported by Windows 98, 2000 and XP?

Additional questions may be appropriate if the candidate indicates that they are familiar with other computer technologies such as Microsoft DOS, Apple, Linux, or Unix. Some sample "other" operating system questions could include: What type of information is contained in a DOS "ini" file? For Linux users, what functions do the dd, loop, mount, and grep commands perform? For a Unix user, a question regarding the function of the shadow file would show understanding of password management.

The candidate's responses should be sufficiently detailed so as to demonstrate functional understanding of how the operating system operates, stores data, implements file security, and documents user activity.

Subject Matter Questions

Interviews of candidates with extensive prior computer forensics experience and training (who are being considered for a high level position) require a much more in-depth assessment. DEA's questions touch on several diverse subject areas, including general communication abilities, legal system understanding, technical computer forensic knowledge, and additional technical questions covering computer hardware, operating systems, and application software. Some sample DEA computer examiner knowledge questions include: What is computer forensics? What is digital evidence? What is the difference between a hard drive duplicate and an image of a hard drive? Compare and contrast the terms physical and logical level data. Explain the terms CRC, carve, and partition slack, free space, write block, and file header.

An excellent question to determine the level of forensic software familiarity can be determined by asking the candidate to identify the most current versions of the computer forensic software (such as Encase, FTK, Ilook, or Safeback) that he/she is using.

A more advanced data format question which most experienced practitioners should be able to answer is: "What types of files are associated with the following file extensions – SAM, QDT, SWP, TAR, and COM?"

It is also recommended that open-ended questions be included in the interview to assess analytic and communication capabilities. A typical open-ended question could be: "What is the significance of the Fourth Amendment to computer search and seizure?"

Supplemental Questions

Some other very important questions in assessing an examiner's prior work experience include:

Describe a typical examination. This question reveals the typical level of effort. Individual organizations examine digital media to different levels depending on need. For example, some examinations are restricted to recovery of child pornographic images, narrow key word searches, or recovery of server logs. This type of examination is not the same as a detailed iterative mining of a hard drive at the sector level, requiring the recovery of file fragments and carving using file signature data.

How long does it take to perform a typical examination? This question validates the information provided in the previous question. Basic data recovery from a hard drive should not take more than 1 to 1.5 days (not counting duplication or imaging and report writing). In contrast, deeper investigative examinations can take from 1 to 2 weeks. A productive examiner's average examination time should be commensurate with the type of examination that is/was required at his/her current or previous computer forensic examination job.

How many examinations has the interviewee completed in the last 12 months and over the last 36 months? These questions provide insight into the degree of work experience and depth of analysis. If the answer to the most recent 12 months is less than 20 examinations, the candidate is most likely a part-time examiner. Furthermore, if the candidate answers less than 50

examinations over the last 36 months, they are relatively inexperienced. However, more is not necessarily better - a candidate that answers that they have completed hundreds of examinations in the last 12 or 36 months may have been conducting only very cursory analyses, and he/she may not actually possess much in-depth investigative examination work experience.

Has the candidate testified as a computer forensic expert witness? If the candidate answers yes, it is always a good idea to follow up with additional questions in order to better evaluate the actual legal experience of the candidate. Introducing evidence is one thing, but explaining file date and time stamp information, or other technical issues (such as file carving or hashing) in layman's terms show qualitative differences in a person's oral communication skills.

However, if a candidate has not testified in court, that fact should not be considered a disqualification. Presently, the frequency of computer forensic examiners serving as either expert or fact witnesses is very low. However, some court room experience should certainly be viewed as adding to a candidate's well-roundedness.

What technical courses has the candidate completed in the last 36 months? This question is another indicator of how current the individual is with state-of-the-art examination software, computer technology, and/or examination techniques. Technical course titles can vary considerably and the quality of the courses is often difficult to assess. Thus, an impressive resume of such courses may indicate expertise that is "factual but not actual". This indicator should therefore be viewed as a complement to other training and work experience questions.

Has the individual completed a proficiency test or computer forensics qualification test within the last 18 months (and if so, from what agency)? The ability to demonstrate competency by passing a recognized qualification or proficiency test is standard quality assurance practice for all forensic science disciplines. Any candidate that has recently passed such a test successfully merits further consideration.

Summary Thoughts

Digital evidence examiner positions, even at the entry level, are not entry level IT positions. A successful examiner needs to have a solid foundation in both theory and practice. Expertise needs to be demonstrated in a number of IT disciplines, including computer networks, hardware, common user and business software, operating systems, programming languages, security, and lastly Internet technologies (such as e-mail and chat). Computer examiner personnel should have credentials and prior work experience commensurate with the position for which they are being considered. Resumes need to be critically evaluated in terms of the scope and depth of the candidate's training and prior work experience. The lack of any widely recognized industry-wide examiner qualification standards, specialized academic degrees, or standardized certificate programs, are problems that all digital evidence hiring managers face. In the interim, an aggressive interview process is highly recommended to offset the limitations in the average work resume.

Questions or comments?
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