

Glue chemicals put the finger on criminals



Officers in England's Northamptonshire Police Department used Super Glue several years ago to repair a tank in the department's darkroom. When they returned to check their repair job several hours later, they found that fumes from the instant-bonding adhesive had chemically



Photos: Firestone Associates

reacted with residues from their skin to outline their own fingerprints on the tank. The ability of the fumes from instant-bonding glues to develop fingerprints also had been noted several years earlier by Japanese technicians and 20 years previously by employees of Eastman Kodak Co.

These chance discoveries of the fuming, fingerprinting phenomenon eventually inspired independent experiments designed to develop a new law enforcement tool for outlining fingerprints heretofore difficult or impossible to obtain — such as those

left on paper money or skin. And at the Conference of the International Association for Identification this week in Monrovia, Calif., one group involved in this research — a Super Glue Corp.-Dura-Print Inc. team — reported several advances in the development of just such a fingerprinting tool. This latest Super Glue fuming process, the team reported, has successfully outlined prints six months to one year after conventional fingerprinting procedures failed to reveal them.

Fingerprints are impressions of the individually unique system of ridges, formed six to eight weeks before birth, on the finger skin. Most latent prints, or those hidden from the unaided eye, are formed when perspiration — a mixture of water, salt, organic urea, potassium chloride, amino acids, riboflavin and other substances — escapes through that ridged network.

One of the most commonly used crime-scene techniques for detecting latent prints is the age-old—but tedious and limited — dusting method: covering an area suspected of having prints with fine powders such as volcanic dust or ground carbon. Another fingerprinting method, commonly used on specimens brought into crime laboratories, involves spraying a surface with the chemical ninhydrin (triketohydrindene hydrate). The major drawback to this method is ninhydrin's highly explosive nature. Other currently used systems include fuming objects with iodine gas; fuming samples with chemicals related to those employed in the newest Super Glue process; and dipping objects in silver nitrate liquid. These systems are handicapped by their messy applications, their quickly fading prints and, in some cases, their ability to damage the objects being examined. Finally, laser light — which excites the riboflavin molecules in perspiration, causing them to fluoresce — is being used to outline fingerprints. The major disadvantage of this technique is its inconvenience: the process currently requires use of a 450-lb argon ion laser.

Development of the latest Super Glue fuming kit represents progress in ridding the fingerprinting process of such handicaps, report spokespersons for its creators, the joined forces of Super Glue Corp., in Ridgewood, N.Y., and Dura-Print Inc. in San Francisco. The kit includes two different solutions — both substances from the cyanoacrylate family, the same chemical class to which instant-bonding glues belong — that are applied to a special gauze generator pad. The visible fumes generated just seconds after the pad is treated with cyanoacrylates are attracted to the water and amino acid molecules in perspiration and thereby outline fingerprints. These prints can easily be removed with a non-caustic solvent. And the pad and chemicals can be conveniently combined in an aquarium-like tank to which crime-scene objects such as weapons can be added. In addition, entire

Airport noise linked with heart disease

Data from an eight-year mortality survey involving 200,000 residents living near the Los Angeles International Airport will be used to indict noise pollution from landing jet aircraft for an increase in deaths from cardiovascular disease and suicide. Though loud noise, especially along jet take-off and landing corridors, has been correlated statistically with elevations in blood pressure (SN: 6/5/82, p. 378) — a risk factor in cardiovascular disease — this appears to be the first study directly linking cardiovascular-related deaths and noise.

In a presentation May 10 at a meeting of the Acoustical Society of America in Cincinnati, William Meecham will report on differences he identified in mortality statistics associated with two communities in the L.A.-airport area. Matched for population, racial makeup and socioeconomic factors, the two regions studied are virtually identical except for average residential-noise exposures, according to the engineer from the University of California at Los Angeles.

Meecham designated an eight-square-mile region adjacent to the airport — where *minimum* outdoor jet noise was measured at 90 decibels (dB) — as his "test area." Industrial workers exposed to 90-dB environments must wear hearing protection (SN: 5/22/82, p. 347) since research has shown permanent hearing loss can occur at levels as low as 85 dB. In the test

area Meecham studied, outdoor noise levels sometimes reached 115 dB. And he found that when windows were closed — something uncommon there during summer months — residential homes seldom attenuated sound levels more than 15 dB. The area is exposed to the thunder from roughly 650 incoming flights daily; at peak daytime periods jets passed overhead only 2.5 minutes apart.

This noisy community was compared with a region bordering it to the south. There the average outdoor noise measured 50 dB, typical of congested urban areas. Since the decibel scale is logarithmic, there is a 10,000-fold difference in sound pressure between 50 dB and 90 dB.

Meecham's data showed the death rate from heart attacks and stroke was 18 percent higher for those 75 years of age and older in the test area, relative to a demographically matched segment in the quieter zone. And the 30 suicides in the test area's 45- to 54-year-old age group were double the quieter zone's age-equivalent rate. Both findings were statistically significant, as was a 60 percent higher incidence of violent death — including murder, suicide and auto accidents — among those 75 and older in the noisy area. Though an elevated violent-death rate was evident for all age groups in the noisy zone, numbers were too small to be statistically significant. —J. Raloff