REFERENCES:

This is a redacted version of a Washington County, Oregon, Sheriff's Office Manual available at http://www.iape.org/emanual/forensic_web_page/latent_manual.htm

7. LATENT PRINTS (finger, palm and foot)

a. The technical basis for latent print identification is based on the following two premises:

i. Papillary ridges are formed on the palmar surfaces of the hands and the plantar surfaces of the feet during fetal development and remain permanent throughout the life of the individual, except through damage by scarring or certain diseases.

ii. No two areas of friction skin (papillary ridges) on the hands or feet of any person or persons are duplicated.

b. Latent prints, in modern forensic terminology, are defined as those accidental or unintentional impressions which have evidentiary value. When the friction skin area of the palmar or plantar regions of the body are touched to a receiving surface, a reproduction of the ridge design from that friction skin area may be left behind on that surface.

c. Latent prints can be divided into two categories:

i. Invisible prints - those made by perspiration and other substances on the skin surface and require development by physical or chemical methods.

ii. Visible prints: Plastic/Patent - those made in soft pliable substances as putty, modeling clay, etc (Plastic), and those made by contamination of the skin with such substances as blood, paint, ink, etc (Patent).

d. The chemical composition of latent print residue is such that chemical techniques can be effectively used to process impressions on most porous surfaces, as well as some non-porous ones.

i. The eccrine or sweat glands on the human body are most concentrated on the palmar surfaces of the hands and the soles of the feet. Secretions from the eccrine glands consist of 99.0 to 99.5 percent water and 0.5 to 1.0 percent solids.

The solids consist of about one-half organic substances and one-half inorganic salts. Sodium chloride is the most prevalent salt present and of the organic substances present, alpha-amino acids are important for latent print chemical processing purposes.

ii. The oils and fats which may be present in latent print residue are primarily the result of sebum secreted by the sebaceous glands. Sebaceous glands are most concentrated on the nose, external ear, mons veneris and scrotum, but are not present on the palmar surfaces of the hands nor the plantar surfaces of the feet. The oily and fatty deposits present in latent print residue are generally the result of contaminates present on the hands from contact with other areas of the body, usually the face. Slight contamination of the palmar surfaces with oils and fats naturally occurs by the flow of sebum from the forearms and dorsal surface of the hands to the palms.

e. The friction ridge skin detail on the hands and feet exhibit distinctive features which can be grouped into three Levels of class and individual characteristics:

i. Level I: General ridge flow and pattern configuration. Not sufficient for individualization, but can be used for exclusion. Detail may include information enabling orientation, core, delta location and distinction of finger versus palm.

ii. Level II: Detail which includes formations; defined as ridge ending, bifurcation, dot, or combination thereof, enables individualization.

iii. Level III: Detail which includes all dimensional attributes of a ridge, such as ridge path deviation, width, shape, pores edge contour, incipient ridges, breaks, creases, scars and other permanent details.

f. No scientific basis exists for requiring that a pre-determined minimum number of friction ridge features must be present in two impressions in order to establish a positive identification. –Ne'urim Declaration, June 29, 1995.

g. Initial Surface Examination

i. Conduct an initial visual examination of the evidence for existing ridge detail utilizing a strong light source.

1st) A visible white light assembly is invaluable in assisting in the location and photography of latent prints on certain surfaces. A 150 watt indoor/outdoor floodlight bulb mounted in a photo-flood reflector or similar housing unit provides an excellent light source for latent fingerprint work. Care must be taken with some types of

evidence (especially dark plastics) to position the light sufficiently distant from the evidentiary surface to preclude melting.

2nd) Examination of evidence for inherent luminescence can be conducted with the use of an alternate light source. (See Appendix E for additional information on light sources.)

ii. Determine the nature of the surface to be processed.

1st) Porous - That type of substrate which absorbs the latent print (untreated paper, cloth, unpainted/ unvarnished wood, etc.).

2nd) Non-porous - That type of substrate, which does not absorb the latent print causing it to set on the surface (plastic, glass, painted/varnished wood, etc.).

iii. Choose the processing procedure to be used.

1st) Porous surfaces will generally be processed sequentially with DFO, Ninhydrin, then physical developer.

2nd) Non-porous surfaces are generally processed sequentially with super glue, dye stain, powder, etc.) as outlined in Appendices C through D.

3rd) Processing submitted latent print lifts will usually involve tape lifts on black or white cards, hinged lifts with transparent or colored backgrounds, rubber, gelatin or electrostatic.

iv. All lifts should be marked with the WCSO number, the examiner's initials, exhibit number, location and date.

v. The identifying markings should be placed on the lifts with transparent backgrounds in such a way as to reflect a positive image of the impression during photography. Both transparent and colored background lifts should be photographed without separating the two parts.

vi. Rubber lifts can have the clear cover removed during photography to eliminate bubbles or dry spots and then the negative should be printed in reverse position to obtain a positive image.

vii. A gelatin lift is used when it is necessary to re-supply moisture to the surface area in order to lift the latent prints. It should be photographed as is and not separated as this will dry out the gelatin.

viii. Electrostatic lifts should be photographed immediately as there is still a slight charge to the film which can continue to attract dust particles and obscure details.

APPENDIX A

QUICK REFERENCE PROCESSING GUIDE

No single technique for recovering latent fingerprints has universal application under all circumstances. Many factors other than the nature of the surface to be examined must also be considered when determining the appropriate technique to use on a specific item of evidence.

The procedures mentioned in this reference guide are designed to accommodate the majority of the evidence encountered.

B. SPECIFIC EVIDENCE:

APPENDIX C

A. PHYSICAL PROCESSING

1. PHYSICAL TECHNIQUES - The development of latent prints through the use of physical techniques does not involve a chemical reaction between the impression and the technique used. They encompass dusting and other discoloration methods often relying on the adhesive quality of certain latent prints.

a. The fixing or clearing of iodine developed impressions is rarely performed due to the chemical techniques (ninhydrin, silver nitrate, etc.) which are subsequently applied to porous surfaces.

2. POWDER TECHNIQUES

a. The primary purposes for using powder techniques in latent print examinations are:

i. To make invisible ridge detail discernible.

ii. To improve the contrast of visible ridge detail.

iii. To facilitate lifting and preservation - this purpose is generally more applicable in a crime scene situation (cars, walls, etc.) than in a laboratory environment.

b. The type of powder used will depend upon:

i. The contrast with the surface on which latent prints are to be developed.

ii. The nature of the surface to be processed.

iii. The special characteristics of the powders available.

3. Powder Application (Dusting)

a. **SAFETY:** The use of fingerprint powders within a laboratory setting should be performed in a contained, designated fume hood. If fume hood ventilation is not available, a particulate respirator (dust mask) should be worn when working with all fingerprint powders. This is especially important in confined spaces or areas with poor ventilation.

b. The key to successful "conventional" powder application (dusting) is the use of a small amount of powder with a delicate touch.

i. Work from a portion of powder poured from your stock container into a special "work" container or poured onto a piece of paper.

ii. Touch only the ends of the brush bristles to the powder. The excess powder should be shaken or tapped off.

iii. Use a smooth stroking motion to guide the brush over the suspected area or over the barely discernible print. If using a fiberglass brush, it is best practice to twirl the brush between your index finger and thumb while very lightly brushing the bristles across the surface.

iv. When sufficient ridge detail has been developed so that the direction of flow of the ridges can be observed, the brushing, if continued, should

follow the ridge flow. Occasionally, in spite of all precautions, the powder will adhere so tenaciously to the object on which the latent is found that brushing will not remove the excess powder. If so, a lifting technique may be used to remove the excess powder. (This process is discussed under Lifting Techniques.)

v. Sometimes a latent print may be enhanced after the initial lifting by additional processing with brush and powder.

vi. The adherence of powder to a latent print can be enhanced by using the 'breath technique'. Gently blowing on a surface while dusting for latent prints sometimes adds moisture to the latent print residue, thereby enabling the powder to adhere to the ridge structure of the latent. All moisture, however, should be visibly evaporated from the surface prior to applying powder.

c. Proper use of the magnetic brush (wand) and magnetic powders is similar to the "dusting" procedure described for conventional powders.

i. When the "closed" magnetic wand is inserted into the magnetic powder container the powders will be picked-up with the tip of the wand. The powders actually form a bristle-less brush.

ii. Only the powder "bristles" should touch the surface being processed, and not the wand itself. A light, smooth stroking motion is used in guiding the magnetic wand over the suspected area.

iii. When the rod is pulled to a fully extended position the powder will be released from the tip.

iv. Excess powder should be removed from the processed area by passing the wand over the area without it actually making contact with the surface.

v. Use of magnetic powders on ferrous metal surfaces should generally be avoided. A "painting" effect can result if magnetic powder is used with such surfaces; additionally, the retrieval of excess powder particles from the surface is more difficult than with other surfaces.

vi. Certain rough surfaces such as phonograph records and wrinkled plastics may be effectively processed with a magnetic wand in that excess powder that catches in grooves or other surface disturbances can be picked-up with a subsequent pass of the wand over that area.

d. Alternatives to the application of "conventional" and magnetic powders.

i. Powders can be sprayed onto surfaces with an atomizer. This method can be used when it is believed that the adhesive nature of the powder will destroy latent impressions when applied with conventional brush and powder methods.

ii. Dry inks and Xerox toner (thermoplastic powders) have been used by some examiners to develop impressions. The special advantage of thermoplastic powders over conventional ones is the ability to fuse the impression to the surface on which it is developed. A heat source such as a flood lamp or hand held drier may be used to fuse the impression to the surface.

iii. Powder may also be applied to a surface with a white cotton glove. A small portion of the glove is dipped into the powder and then gently rubbed over the "super glue fumed" area. This method seems to work well for leather surfaces where the powder can fill the grain creases of the leather thus obscuring the latent prints.

4. Lifting Techniques

a. After a latent print has been identified through dusting it will be necessary to preserve it for future comparisons. This can be accomplished in three ways.

i. Lifting tape can be applied directly over the surface which was dusted to preserve the latent impression.

The presence of the "taped over" latent impression in the exact location and position it was developed is usually more desirable for presentation in court than a "lift" of the impression with an explanation in words of where it used to be. This method however is not always practical in many crime scene applications (cars, etc.).

b. The developed latent can be removed from the surface through the use of tape or lifts. Should an analyst prefer to lift an impression from an exhibit that has been

submitted to the laboratory, there is often sufficient discernible ridge detail remaining on the surface after lifting so that it may be taped over and remain intact for later reference. Should there not be discernible detail remaining, it is often possible to re-dust the surface and again develop detail that can then be taped over.

i. "Conventional" powdered prints may, in effect, be fused to the surface on which they are developed by spraying with clear lacquer after they are photographed.

When spraying clear lacquer on plastic surfaces, a test spray should be made on an area away from the developed latent impression to determine if the solvent used to carry the lacquer will deteriorate the plastic.

c. When using lifting tape to remove a developed impression, care should be taken in unrolling the tape from a roll so that hesitation creases do not occur. The unrolling should be performed in one smooth, continuous action.

d. The application of the lifting tape (or other lifting device) to the surface should also be in one smooth motion. The bulb of your finger or a rounded object may be pressed to the tape during application to preclude the appearance of air bubbles. Some bubbles can be eliminated effectively (without damaging the impression) by applying pressure with your finger (or other smooth, rounded object) to force the air pocket out at the edge of the tape. Other instances will occur when a large disturbance (crease, tear, etc.) is better left alone.

e. The lifting of the impression away from the surface should also be in a smooth continuous motion. The application to the backing material should be as described for application to surfaces bearing latent impressions, above.

f. The lift should be marked on the positive image side with the location from where it was taken; the date, time, and initials of the person taking the lift; and, a number designating which lift of a specific impression it was, such as 1(1), 1(2), etc.

i. Caution must be used in determining the positive viewing position of transparent backed lifts. Manufacturers have erroneously labeled the "correct viewing side" on some commercially produced hinge lifts. Un-resourceful investigators have also at times torn apart two hinge lifts, applied one lifting (adhesive) tab to another and thus complicated the question of positive viewing. Care must also be exercised in determining that a transparent plastic backing used with a tape lift is not actually the adhesive half of a hinge lift (bearing the impression).

ii. Remember, any latent impression appearing on the lift which was made by the individual taking the lift should have an "X" marked over it so as not to confuse the 'accidental' latent with the 'true' latent being lifted.

1st. The advantage of lifts over lifting tapes is convenience, since there are no ends to cut or tear. Hinge lifts can be directly compared to inked impressions.

2nd. Garland is an inexpensive and useful item that can be included with your lifting equipment. Ordinary Christmas decoration type garland with the very pliable plastic bristles can be easily used to eliminate the static electricity problem of powder "jumping" from the evidentiary surface to the lifting medium as you are applying it. Merely bring the non-adhesive "back" side of the tape or hinge lifter into contact with the bristles of a short string of garland (suspended out of the way in your work area) immediately prior to lifting the evidentiary impression. This will neutralize the static charge built up from peeling the tape away from the roll (or the protective cover from the hinge lifter).

APPENDIX D

A. <u>CHEMICAL PROCESSING</u>

1. CHEMICAL TECHNIQUES - The development of latent prints through the use of chemical techniques occurs because of the chemical reaction between the latent print residue components and the chemical technique components. These techniques can be effectively used to process impressions on most porous surfaces, as well as some non-porous ones.

2. NINHYDRIN (triketo-hydrindene hydrate) - This processing technique is probably the one most used for porous evidence. It is done after iodine fuming and DFO processing and prior to physical developer processing. (FORMULARY, Appendix F)

a. Many documents examined for latent prints bear indented writings and inked impressions which are valuable to the submitting unit in processing their case. The application of liquids (ninhydrin solution, DFO, etc.) to a surface bearing indented writing can cause paper fibers to return to their original position (obliterating indentations). Further, despite careful selection of an appropriate solvent, some inks occasionally run. It is therefore imperative that document evidence be carefully

reviewed for potential damage by a Questioned Document Examiner or discussion with submitting investigator/agency before Latent Print processes commence.

b. Ninhydrin reacts with alpha-amino acids, proteins and polypeptides, which are present in a variety of, body fluids including blood, feces, milk, nasal mucus, saliva, semen, sweat, urine and vaginal fluid.

c. HFE-7100 and Pentane are the most commonly used solvents for ninhydrin processing within this disciple. Acetone, can sometimes be used, but only on items containing no mechanical or handwritten ink (as considerable damage to these inks will occur).

d. Water may not be used as a carrier for ninhydrin, in that amino acids are also water soluble.

e. Application of the solution may be accomplished through spraying, brushing or dipping. NOTE: If ninhydrin is to be sprayed, it must be conducted within a ventilated fume hood.

f. After applying a ninhydrin solution to a surface, it should be allowed to dry at room temperature.

g. Subjecting the ninhydrin surface to a combination of heat (approximately 80 degrees Fahrenheit) and humidity (approximately 80%) can accelerate the reaction. (Several passes with a steam iron above the ninhyrdin surface will suffice for heat and humidity.) Do not use a steam iron or humidity chamber on ninhydrin treated wood or very porous paper such as tissue or paper towels. The humidity will cause a migration or blurring of ridge detail.

h. To allow for the possibility of additional latent development, the processed item must be allowed to sit for 24-hours before utilizing the next processing method or evidence repackaging. Heat and humidity may be implemented either before or after this 24-hour period.

i. The developed impression will appear to have a purplish discoloration. This discoloration is known as Ruhemann's purple after C. Ruhemann who discovered the color combination in 1910.

j. Techniques utilizing "dry" ninhydrin may also be employed in developing latent prints on paper.

i. The powdered ninhydrin can be sprinkled on the surface to be processed and then subjected to heat and moisture to develop the latent prints.

ii. A blotter can be dipped into a ninhydrin solution and then dried. The surface to be processed is placed between the dried blotter and another sheet of paper. The ninhydrin is absorbed into the processed surface. Heat and moisture can then be applied to the processed area.

k. Because the ninhydrin/amino-acid reaction is very sensitive, very minute traces and very old prints (many years) can be recovered.

l. Ninhydrin is sometimes not appropriate for use on paper with a high animal glue (gelatin) content such as jewelry gift boxes. The large concentration of amino acids in these surfaces causes a strong purplish discoloration and generally a total loss of latent print detail.

m. Ninhydrin stains can be cleared from documents, but is not recommended as a general rule. Ninhydrin stains should not be cleared if any additional processing is planned as the clearing solutions may destroy the salts from the latent print residue which are essential for physical developer processing. Documents and papers should be blotted and dried immediately after application of clearing solutions.

n. One clearing solution combines one part household bleach with two parts water.

o. A second clearing solution combines one part concentrated ammonium hydroxide with two parts water.

5. CYANOACRYLATE FUMING ("SUPER GLUE")

a. **SAFETY**: Cyanoacrylate ester fumes are strongly irritating to the eyes and respiratory system. Fuming should only be conducted in a well ventilated area and non-porous gloves should be worn to prevent skin contact.

b. "Super Glue" is a trade name of Duro, a subsidiary of Loctite Corporation. As used herein, "super glue" is a generic reference to any of a number of brands of cyanoacrylate esters or methyl esters, widely available in a variety of viscosity's.

c. Fuming with cyanoacrylate ester (super glue) will cause latent print residue on a variety of non-porous (and some semi-porous) surfaces to appear white in color.

d. Cyanoacrylate ester fumes are monomers that polymerize onto contaminates such as latent print ridge detail at a rate different from surrounding substrates. Latent prints thus developed are fused to the surface and not easily damaged.

e. Latent print development with super glue fumes can be accomplished by the use of a "traditional" fuming chamber (cardboard box, plastic bag, fish tank, etc.), commercially available Vacuum Chamber or fuming wand.

i. The liquid glue is placed in a disposable container (aluminum foil works well), for easy clean-up purposes, and this container is then placed in the bottom of the fuming chamber. The number of drops to be added is primarily dependent upon the size of the particular fuming chamber and the surface area of the item to be fumed.

ii. Some analysts prefer heating the chamber or the surface upon which the drops of glue are deposited to expedite the development process.

iii. This can be accomplished with a coffee cup warmer or a light fixture assembly (60 watt bulb). DO NOT USE A HOT PLATE OR DIRECT FLAME. The super glue is placed in the bottom half of a soda can and the can is set on top of the light bulb. (Note: Do not let the light bulb touch the walls of a cardboard 'chamber' or the evidence as this may start a fire.

iv. It should be noted, that heating the chamber can cause a glaze-like coating to cover the entire evidentiary surface resulting in considerable loss of contrast in some extreme instances. Care must also be exercised to not "boil" the cyanoacrylate ester causing a spattering of residue on nearby evidence.

l. The addition of humidity to the fuming chamber plays a major role in successful development of white ridge detail in latent prints.

m. To allow maximum exposure of fumes to the item being super glue fumed it should be hung up, stood up, or leaned on its edge inside the chamber.

n. Test prints on a similar surface should be exposed to the super glue fumes at the same time as the item fumed. This test print will help to determine the length of time needed for polymerization to occur on your item.

o. Close the fuming 'chamber' and turn on the heat for ten minutes for a small chamber and 20 minutes for a large chamber. Check the test print and either add more

super glue and continue to fume at five-ten minute intervals or stop if the test print is visible.

p. Additional latent prints will tend to develop on leather products even after initial super glue fumed prints are visible if fuming is continued. Care should be taken to photograph those visible latents and then to continue to super glue fume the leather for additional development. 10-15 minute intervals are suitable until such time as the examiner feels all latents have been developed. Additional physical or chemical processing techniques are difficult to conduct on leather due to the nature of the grain and the absorbency of the leather itself. Super glue fuming is the main technique used on these items.

q. Sometimes over-development will occur, usually in the form of a heavy white deposit obscuring most of a latent print. Using an adhesive lifting technique (tape, lifter, etc.) is effective in lifting away the heavy upper deposits, revealing underlying ridge detail.

r. **SAFETY:** When using any of the recommended chemical cleaning agents for removing cyanoacrylate deposits (acetone, acetonitrile, or DMSO) only butyl rubber gloves will provide adequate hand protection. These cleaning agents should only be used in a well ventilated area. As always, a lab coat and eye protection should be worn when working with any chemical.

i. Cleaning agents for the removal of cyanoacrylate deposits in fuming chambers, vehicles, etc., include soapy water, acetone, and acetonitrile (sometimes sold commercially as cyanoacrylate ester deposit remover). One of the most efficient solvents is di-methylsulfoxide (DMSO, also called methyl sulfoxide) which easily dissolves deposits. DMSO has a garlic-like smell and should be applied wearing gloves. The common commercial brand solvent WD-40 also removes deposits reasonably well, and may be the preferable solvent for cleaning a vehicle.

t. Fuming Wands are commercially available. These hand-held wands allow for cyanoacrylate processing to be done in crime scene situations. For use, please consult the instruction manual supplied with your fuming wand.

APPENDIX G

EQUIPMENT/SUPPLIES and MAINTENANCE

A. BRUSHES

1. A wide variety of types, shapes and sizes of brushes are available for processing evidence with powders. The total supply of different kinds of brushes required in a Latent Print discipline depends on the types of brushes and colors of powders used. An ample number of appropriate brushes will help to preclude cross-contamination of powders and brushes. While larger brushes are ordinarily used for large areas and smaller brushes on concentrated work or individual latent prints, fiberglass brushes are often used for both instances.

2. The three primary categories of brushes are feather, fiberglass, and magnetic. Their general purposes are described below.

a. Feather Brush - Generally used for fluorescent powder applications and delicate processing purposes involving the removal of excess powder or soot. Feather brushes are not as durable as other types and must be handled with greater care.

b. Fiberglass Brush - Consists of fine fiberglass bristles and is used by many examiners as an all-purpose brush in lieu of several other sizes and types. The primary advantage is the ability to process a large area with considerably less "re-powdering" of the brush than other types. These brushes are more expensive than hair or feather brushes but often last longer than either type.

c. Magnetic Brush (Wand) - These wands are used only for the application of magnetic type powders (or mixtures of magnetic/conventional powders). In that the "bristles" involved consist of the magnetic powder itself, the applicator head of the wand will not wear out. One magnetic wand will suffice for many colors of powder. Some examiners also use 5 cm and 10 cm wide magnetic brushes for processing large areas. "Self-contained magnetic brushes" include a built-in powder reservoir.

3. Maintenance of Brushes

a. Brushes may be cleaned with mild detergent and water. Blow drying will help (especially with hair brushes) to prevent matting after washing with the soapy solution. Dirty or contaminated brushes cannot always be cleaned to alleviate stiff bristles.

Brushes that have been cleaned and still have stiff bristles should not be used for dusting latent prints.

B. CASTING MATERIAL

1. Commercially available silicone rubber or dental/die stone powder may be used for lifting difficult latent impressions from uneven surfaces. Merely mix according to manufacturer's directions and apply to the intended casting area.

2. Should you need to change a light colored casting medium to dark, you can cautiously add black fingerprint powder to the mixture until the desired shade is achieved. Dark colored silicone rubber is now available.

H. LIFTING MATERIALS

1. Lifting materials for latent fingerprints consist primarily of transparent, opaque adhesive-coated materials and electrostatic dust lifts. The background color of the opaque lifting medium is dependent upon the color of the impression to be lifted.

2. Caution must be exercised in utilizing general-purpose tapes (book-binding, etc.) in place of specialized latent print lifting tape or lifts. The reason being, that a thick adhesive emulsion base can cause the migration and disappearance of some latent print ridge detail (especially with some light colored powders) either immediately or over a period of days or weeks. Following is a list of recommended tapes and lifts for latent print preservation.

a. Tape - Special latent print lifting tape, both transparent and frosted, is available from several commercial sources. They enable direct comparison with inked impressions and can be used with a wide variety of black or white backing materials, including pre-printed backing cards, index cards, photographic papers and vinyl backing tabs. "Vinlon" flexible lifting tape and other black or white rubber tapes may be used in place of rubber lifters for curved surfaces.

b. Rubber Lifts - Available in black or white with transparent covers, the primary advantage is the ability to lift latent impressions from curved surfaces without the creases inherent to tape and hinge lifts. A disadvantage is that the ridge detail must be photographically (or optically as with a prism/mirror viewer) reversed to enable comparison with inked impressions. Rubber lifts are also available in sizes appropriate for lifting entire palm prints and footprints.

c. Electrostatic Lifting Material - Electrostatic lifting film for use with the electrostatic lifting kit is available commercially and should be used whenever possible. After photographs have been taken of the current dust impression the film can be wiped clean and used again. Remember to lay the film flat or roll it, never fold as it will permanently crease.

d. Gelatin Lifts - These are soft pliable lifts with a moist gelatin like base and can be used for dried mud, dried blood, or dust impressions. They may stand alone or can be used as an adjunct to the electrostatic lift for dust impressions. These are available commercially with black, white, or transparent backgrounds and come in various sizes.

J. MAGNIFYING GLASSES

1. Fine quality magnifying glasses are essential to latent print examination work. Usual magnification is approximately 4.5 times. Henry, Battley and other types of reticules are marketed to fit these magnifying glasses.

2. Headband mounted magnifying glasses can be useful during certain processing and examination procedures. These units are commercially available through welding supply dealers and leave both hands free while the examiner manipulates a surface that cannot be placed "under" a conventional fingerprint magnifier.

3. Magnifying glasses should be cleaned with commercially available window/lens cleaner. No caustic chemicals should be applied to the lens.

L. POWDERS

1. Many commercially produced latent print "dusting" powders are available and many are very similar from company to company. No powder is universally applicable to all types of non-porous surfaces and most examiners need a stock of a variety of types and colors of powders for specialized applications. While such powders are usually commercially procured, some examiners prefer to prepare a portion of their stock powders.

2. Powder stocks may be purged of unwanted contaminates or large powder particles by sifting them through a number 60 sieve or using a mortar and pestle.

Storing powder in sealed containers and out of excessively humid conditions will reduce the need for such purging. Using a mortar and pestle to grind commercial powders (especially magnetic powders) can improve their fine consistency.