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A HOMICIDE INVESTIGATION KIT

C. M. Wilson[†] and M. E. O'Neill[†]

In the course of any criminal investigation—particularly one involving a homicide—it may become necessary for investigators to utilize certain implements and equipment in effecting the recovery and preservation of certain evidence. Since it cannot always be determined in advance just what equipment may be required, it is obviously advantageous for investigators to have many such aids readily accessible in convenient form at the time of their arrival at the scene of a crime. Toward this end, therefore, a portable investigation kit can be of inestimable value.

About a year ago the staff of the Chicago Police Scientific Crime Detection Laboratory designed and prepared an investigation kit for the Homicide Detail of the Detective Bureau of the Chicago Police Department. Since its practical usefulness in homicide investigations has already been quite clearly demonstrated, and since such a kit is not available as a standard commercial product, a detailed description is here presented for the interest of other homicide investigators.¹

The homicide investigation kit, which may also be utilized for other types of investigations as well, consists of a large carrying case (27" x 12" x 13½") in which are enclosed four smaller cases: a Collection Kit (25" x 12" x 2¼"); a Tool Kit (25" x 12" x 2½"); a Paraffin Casting Kit (12" x 7¼" x 5¼"); and a Plaster Casting Kit (18" x 12" x 5"). (See Figure 1 showing these four small kits in place in the carrying case.)

The Collection Kit (II) contains specimen bottles, cardboard boxes, envelopes, various types of marking devices, and other equipment for the collection and preservation of evidence, and, in addition, there is included the necessary material for making the benzidine test for blood.

The Tool Kit (III) contains chisels, wrenches, saws, and other tools for cutting wood or metal specimens, removal of locks, recovery of bullets embedded in walls, etc.

The Paraffin Casting Kit (IV) contains all of the equipment and materials required in the preparation of paraffin casts of the hands of a person

[†] Chicago Police Scientific Crime Detection Laboratory.

¹ The principal problem in the construction of such a kit is the selection of instruments and materials which are suitable for investigational needs and which at the same time are readily

portable. When the necessary equipment has been assembled, the construction of the carrying cases is a relatively simple matter. (The cases illustrated in Figure 1 were constructed by the Knickerbocker Case Company of Chicago, Illinois.)

suspected of firing a weapon—which casts are subsequently tested by laboratory technicians for gunpowder residues.

The Plaster Casting Kit (V) contains instruments and materials for the making of plaster casts of footprints, tire tracks, or other impressions found in

dirt, dust, snow, or similar surfaces.

Equipment for photographing crime scenes or for developing latent fingerprints is not included in the kit since these phases of homicide investigation—in the Chicago Police Department—are functions of the Bureau of Identification.

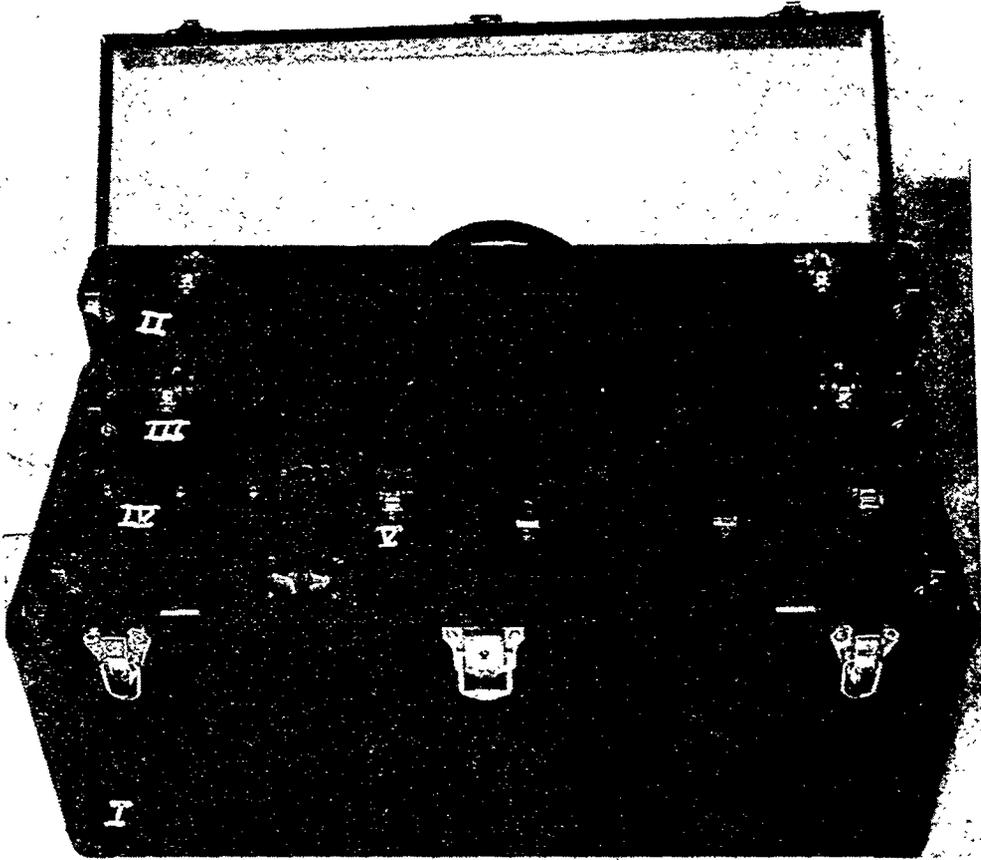


FIGURE 1

Homicide Investigation Kit

I—Carrying Case

II—Collection Kit

III—Tool Kit

IV—Paraffin Casting Kit

V—Plaster Casting Kit

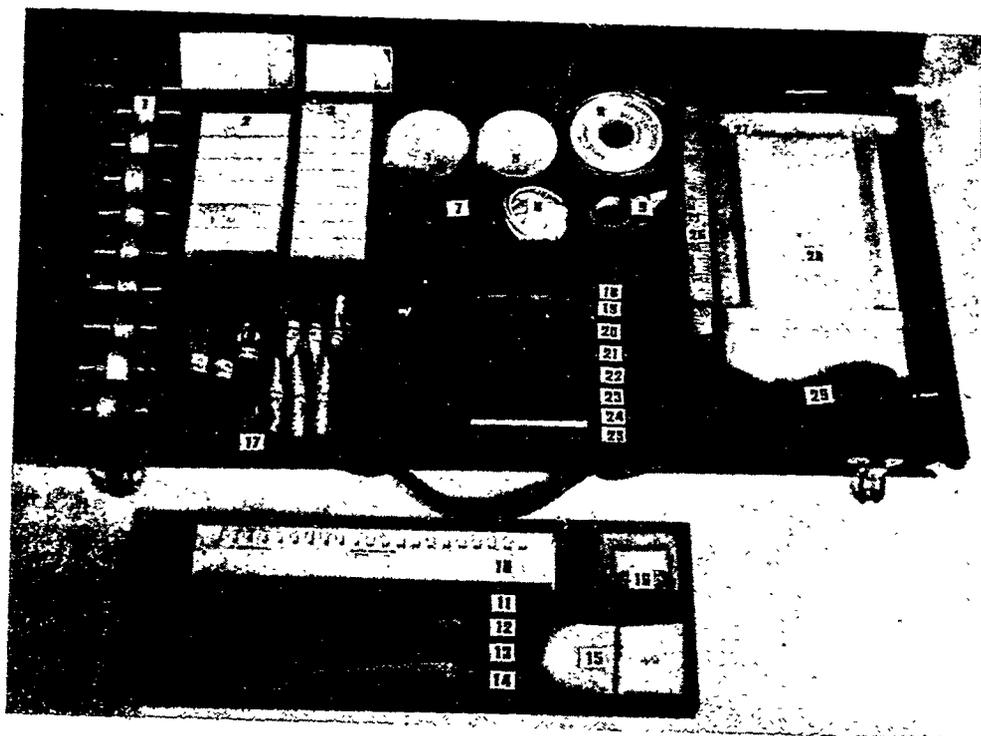


FIGURE 2
Collection Kit

Items

1. Wide-mouth specimen bottles
2. Large cardboard pill boxes
3. Small cardboard pill boxes
4. 5. Porcelain evaporating dishes
6. Roll ½" white adhesive tape
7. Glass-stoppered bottle
8. Ball white twine
9. Transparent Scotch tape
10. Metric paper scales
11. Indelible pencil
12. China marking pencil
13. Black grease crayon
14. Camel's hair brush
15. Glassine envelopes
16. Gummed labels
17. 3 sets ampoules containing benzidine blood test ingredients: acetic acid, benzidine, sodium perborate
18. Steel scribe
19. Medicine dropper
20. Forceps
- 21, 22. Scalpels
23. Triangular file
24. White chalk
25. Blue chalk
26. Six-foot folding rule
- 27, 28. Two sizes envelopes (metal seal)
29. Extension cord

Use

- Container for small articles or liquids.
Containers for cartridge cases, shot pellets, or other small objects. Cotton in boxes for protective covering of objects.
For making benzidine blood test. (See item 17.)
Sealing item 1 above; marking articles.
For mixing benzidine blood test ingredients.
Tying and wrapping evidence.
For securing paper scales (item 10) when making scaled photographs.
Measuring; scaling photographs.
Marking fabrics, etc., for identification.
Marking glass or other smooth objects.
Marking light-colored objects.
For recovering surface residues (dust, etc.)
Preserving hairs, fibers, etc.
Marking samples or specimens.
Preliminary test for blood.
- Marking fired bullets, cartridge cases, metal or similar objects for identification.
Making blood test.
Picking up small objects.
Scraping surface accumulations (dried blood, etc.)
Opening glass ampoules (item 17).
Marking on dark objects.
Marking on light-colored objects.
For measurements at crime scenes.
Containers for papers, documents, flat objects.
For use with Kit IV.

On the reverse side of the removable (17 in Figure 2), the following directions for making benzidine tests are

mounted under a celluloid cover:

Materials: porcelain dishes, glass-stoppered bottle, medicine dropper, triangular file, ampoules of acetic acid, benzidine, and sodium perborate.²

Procedure:

1. Open the ampoules by filing a scratch mark near the tip and then knocking the tip off with the file. Pour the acetic acid in the glass-stoppered bottle and add to it the benzidine powder. When this has dissolved add the sodium perborate and replace the stopper.

2. Place a very small fragment of dried stain in a porcelain dish and with the medicine dropper add a drop of benzidine reagent. A deep blue or bluish-green coloration is formed at once (within five seconds) if blood is present.

3. This test does not furnish conclusive proof of the presence of blood, but any stain that gives a positive reaction as described above should be submitted to the laboratory for confirmatory tests.

*The reagent must be made up fresh each time it is used, as it becomes too dark for use after 20-30 minutes.*³

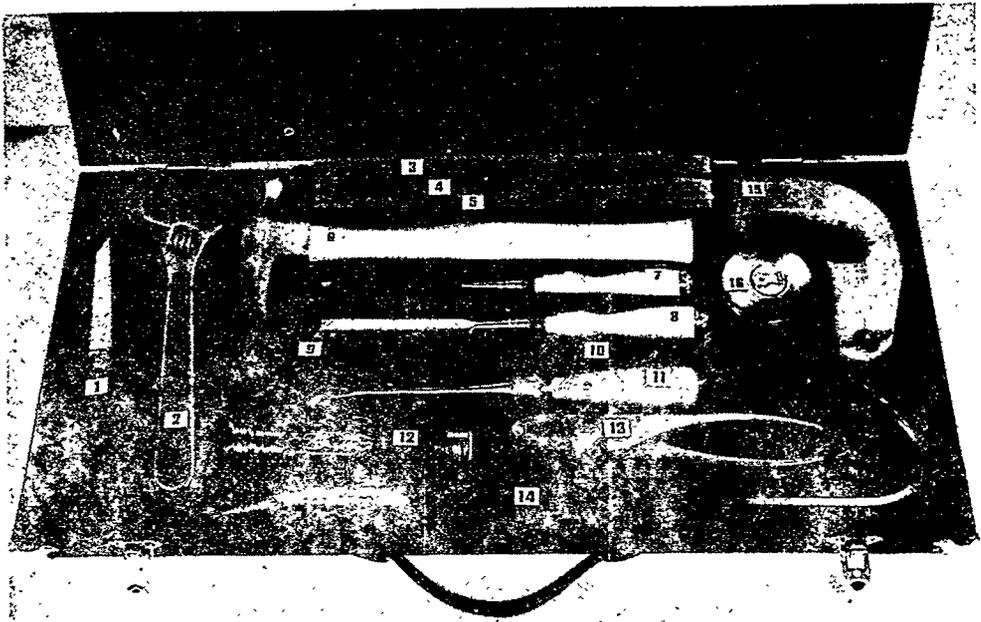


FIGURE 3
Tool Kit

Use

- Items*
1. 6" scissors
 2. 10" Crescent adjustable wrench
 3. Keyhole rip-saw blade
 4. Keyhole metal-cutting blade
 5. Keyhole cross-cut saw blade
 6. Ripping hammer
 7. 1/4" wood chisel
 8. 3/4" wood chisel
 9. 1/2" cold chisel
 10. Stick sealing wax
 11. 10" screw driver
 12. Flashlight
 13. Gas pliers
 14. Ripping bar
 15. Keyhole saw handle
 16. 50' steel tape

- Cutting fabric specimens, etc.
Removal of bolts, nuts, etc., in search of evidence.
Cutting wood specimens.
Cutting metal specimens.
Cutting wood, removal of locks, bullets, etc.
Removal of plaster, laths, etc.; for use with items 7, 8, 9.
Removal of locks, etc., or recovery of bullets from walls.
Cutting of metal objects.
Sealing packages or bottles containing evidence.
Removal of locks or automobile parts.
Supplementing regular flashlight carried in squad car.
Removal of locks, wire specimens, etc.
Removal of wood specimens or nails.
For use with items 3, 4, and 5.
Measurements at crime scenes.

² 11 cc. of 90% acetic acid, 0.1 g. of benzidine, 0.2 g. of sodium perborate. The ampoules are made by placing the ingredients in small test tubes which are drawn out and sealed in a Bunsen flame.

³ In the preparation and arrangement of the benzidine blood test materials the Laboratory Staff received the very helpful assistance of Dr. C. W. Muehlberger of the Cook County Coroner's Laboratory.

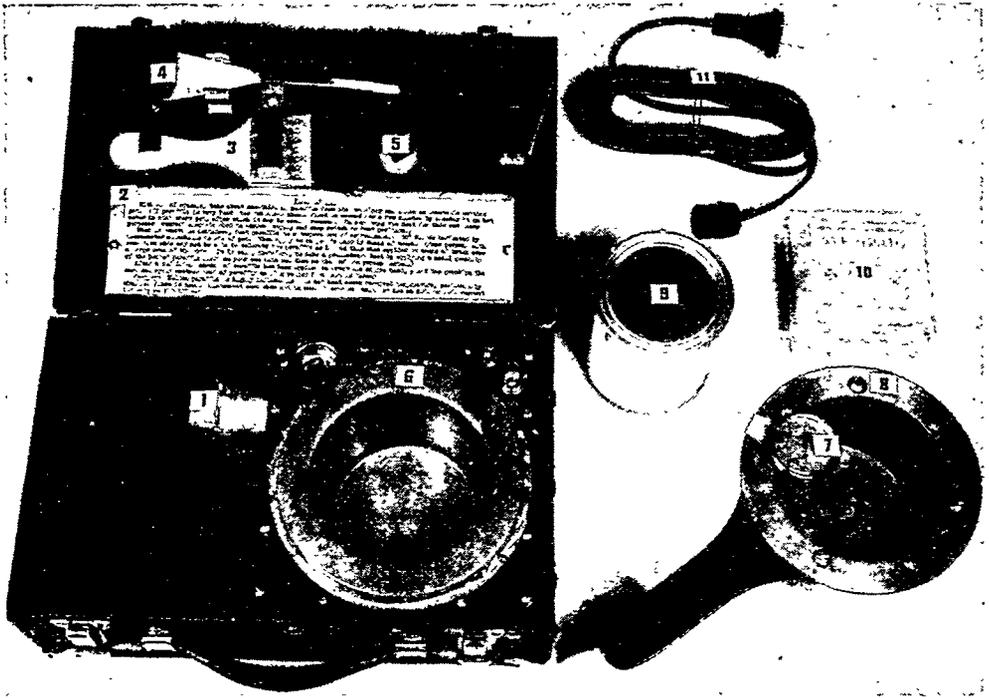


FIGURE 4
Paraffin Casting Kit (For Nitrate Tests)

- | Items | Use |
|---|---|
| 1. Carrying container for thermometer (7) | |
| 2. Instructions for making paraffin casts | |
| 3. Brush | For applying paraffin. |
| 4. Spatula | For removing paraffin from container (9). |
| 5. Medium screw plug adapter | For light socket outlet to plug on cord 11. |
| 6. Electrically heated copper melting pot | Heating element for use with (8). |
| 7. Weston Bimetallic thermometer | Determining proper temperature of paraffin. |
| 8. Copper melting pot | For melting paraffin. (Either in 6 or over gas burner.) |
| 9. Carrying container for paraffin | |
| 10. Gauze pads | For reinforcing paraffin casts. |
| 11. Two conductor cord | To connect 6 to electric current. |

The melting pot included in the paraffin casting kit⁴ actually consists of two separate copper pots. No. 6 is a specially built electrically heated wax pot, the current for which is supplied from 110 volt lighting circuits, either A. C. or D. C. In the event electric current is not available, pot No. 8, which fits inside No. 6, can be removed and used over a gas flame. The thermometer (7) is a bimetallic thermometer⁵ for use in determining the

temperature of the paraffin at the time it is applied to the hand of the suspect. A two-conductor extension cord (11) is included for use with the screw adapter (5) carried inside the top of the case.

The paraffin casting instructions, attached to the lid of the kit and covered with a strip of celluloid, read as follows:

With aid of spatula, take about one-third of paraffin from tin container and place in removable melting pot. (If paraffin is very hard, the container should first be warmed for a few minutes by

⁴ Obtainable from Arthur F. Vyse & Co., Chicago, Illinois.

⁵ Manufactured by the Weston Electrical Instrument Corporation, Newark, New Jersey.

placing it in hot water in stationary pot, after which it may be easily removed. In supplying the heat for this and later purposes, connect electric cord to current supply and snap switch to "on" position.)

When in removable container, heat paraffin to a temperature of approximately 150° F., as indicated by thermometer attachable to rim of pot. Then apply to subject's hand by means of brush. (Some persons with sensitive skin may not be able to tolerate the paraffin as hot as this when applied by means of brush over a large area of the skin. It is well, therefore, to make a preliminary test by applying a small quantity of the heated paraffin first on your own skin and then on that of the person tested.)

After a sufficient amount of paraffin has

been applied to cover the entire hand, place the gauze on the cast and apply another coat of paraffin until a rather firm cast is formed.

Caution: Melted paraffin is highly inflammable. Do not heat above required temperature, particularly when gas flame is used. Disconnect cord when not in use. Electrical unit for use on A.C. or D.C. current, but only on 110-120 volt.

Although the results of the nitrate tests subsequently made on such paraffin casts by the laboratory technician are not definitely indicative of the fact that the hand thus cast did or did not fire a gun, they are occasionally helpful to the investigator.

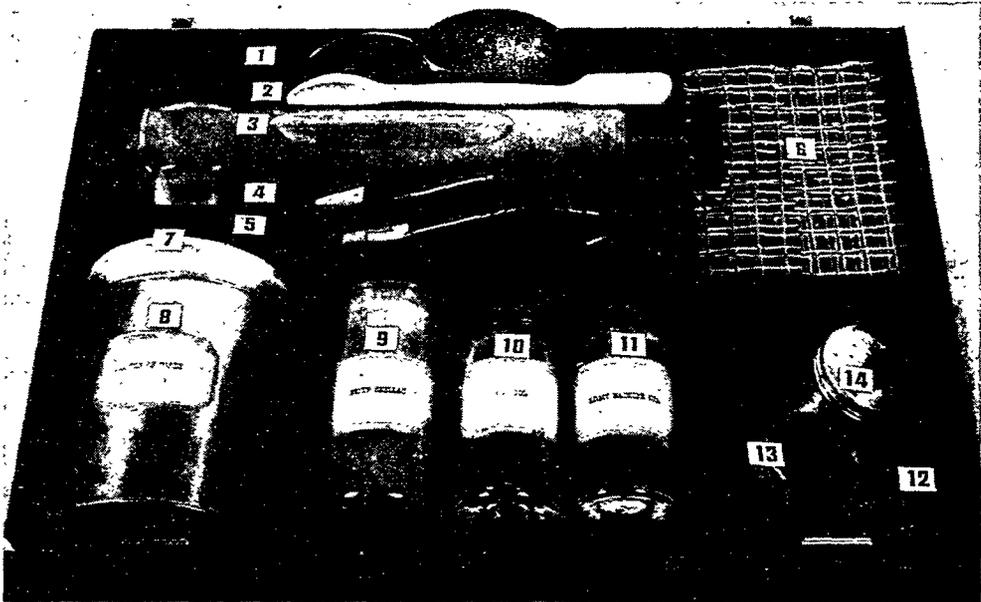


FIGURE 5

Plaster Casting Kit

Items

1. Steel spoon
2. Porcelain spoon-spatula
3. Atomizer
4. Pliers
5. Diagonal cutters
6. Half-inch wire mesh
7. Filter paper
8. Can of plaster of Paris
9. Bottle of white shellac
10. Bottle of wood alcohol
11. Bottle of light machine oil
12. Rubber mixing cup
13. Metal measuring cup
14. Powder shaker

Use

- Stirring and ladling plaster.
 Stirring plaster mixture and loosening completed cast.
 Spraying shellac.
 Bending and shaping wire-mesh reinforcement (6).
 Cutting wire mesh.
 Reinforcing plaster casts.
 Soaking up water in impressions in very wet soil.
 Plaster casts.
 Spraying impressions in loose soil or sand.
 Diluting thick shellac and cleaning atomizer after use.
 Spraying impressions in wet soil or mud.
 Mixing plaster and water.
 Measuring plaster of Paris and water.
 Sprinkling dry plaster on impressions in snow.

Included in Kit 5 are the following instructions for making plaster casts:

General Directions

1. This kit is designed for the preparation of plaster casts of footprints, heel-prints, tire tracks, wheel marks, or similar traces in soft surfaces such as mud, dust, sand, snow, etc. In some cases it can be used also for the reproduction of certain tool marks where it is not necessary to make a cast showing fine details.

2. Before making the cast the mark or track should be measured carefully with a tape or rule and also located accurately with reference to surrounding objects. In some cases, at least, a scaled photograph should also be taken before the cast is made.

Impressions in Soft Dirt, Mud or Sand

1. If water is standing in the print, it should be removed with the spoon or soaked up with the filter paper.

2. If loose sticks, pebbles, cinders, bits of paper or similar debris are found in the print, they should be carefully lifted out.

3. If the impression is in *dust, sand, or loose dirt*, the inside of the print is sprayed with white shellac to harden the soil and bind the particles together. This should be done slowly and carefully at first, holding the sprayer two or three feet above the print and allowing the shellac to settle down into the print in the form of a light mist. After this first layer has hardened a few minutes, the sprayer can be held closer to the print. If the shellac becomes thickened so that it does not spray easily, it can be thinned by adding a little alcohol. (If the impression is in *very wet soil or mud*, it may be sprayed with light machine oil until evenly coated with a thin film.) The sprayer must be emptied and thoroughly cleaned with alcohol after each use.

4. While waiting for the shellac to harden in the print, the mesh wire is

cut to a size slightly smaller than the track to be cast.

5. The plaster of Paris is then mixed. Use the rubber mixing cup and add four cups of water (metal measuring cup). Dry the measuring cup and add $7\frac{1}{2}$ to 8 cups of plaster of Paris. The plaster should be added to the water as rapidly as possible but should not be "dumped" in. As each portion is added the cup should be shaken in such a way that the plaster is *sprinkled* over the entire surface of the water. After *all of the plaster* has been added, stir the mixture *slowly and carefully* with the spoon to eliminate lumps. Do not "beat" the plaster, as this may introduce air bubbles which will show in the finished cast. When the plaster mixture is properly prepared it should have the consistency of "pancake batter."

6. With the steel spoon, ladle the plaster out into the track—spreading it around lightly with the bowl of the spoon—until the bottom of the impression is covered to a depth of about one-half inch. Lay the wire mesh support on the top of this first layer and add the remainder of the plaster at once, making sure the print is completely covered around the edges.

7. Allow the cast to harden. When hard, loosen the soil around the edges with a knife or spatula and lift the cast out with both hands. Wrap in newspaper or cloth. The dirt adhering to the bottom of the cast can be removed later with a brush and water.

Impressions in Snow

1. Fill the powder sifter with dry plaster of Paris. Sprinkle a thin layer of plaster over the entire impression and allow it to harden. If there is insufficient moisture in the snow to set the plaster, the powder may be fixed by spraying with a little shellac.

2. Prepare the usual mixture of plaster of Paris and water and complete the cast.