

# **Alleged Pore Structure In Sasquatch (Bigfoot) Footprints**

*A laboratory experiment suggests that the 'pores' in the casts of Bigfoot footprints are artifacts of the casting process.*

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**R**ECENTLY attention has been drawn to new evidence supporting the existence of the legendary Sasquatch (Bigfoot). The primary discoveries are footprints allegedly left by Sasquatch in southeastern Washington and plaster casts of these footprints that showed dermal ridges on which sweat pores were allegedly visible (Begley 1987).

The best-documented report of Sasquatch dermal ridges and porosity is that of G. S. Krantz (1983). In June 1982 a Forest Service patrolman said he encountered a hairy animal of human shape, believed to be Sasquatch. A plaster cast was made of one of the footprints left by this creature. The following day footprints of two such creatures were found, one matching the print previously cast. Three casts were made of the second creature's footprints. It is the latter three casts that were the subject of Krantz's analysis.

The Sasquatch footprints were left in damp loess. Loess is a typically buff-colored unstratified soil composed of unconsolidated porous silt. The sizes of loess particles vary somewhat according to the geographical area in which the loess was deposited; however, loess particles generally range in size from 31.3 to 62.5 micrometers ( $\mu\text{m}$ ) (Pettijohn 1975). In the three casts analyzed by Krantz, the dermal ridges were clear and were generally spaced 0.5 millimeters (mm) apart, displaying bifurcations, terminations, and short segments, all of which are common features of human dermatoglyphics. Many small indentations were observed on the dermal ridges of the casts.

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FIGURE 1. Photomicrograph of cast of human footprint. Arrows indicate "pores."

These were interpreted by Krantz as sweat pores. These "pores" were spaced approximately 0.5 mm apart and were centered on the dermal ridges; they varied in diameter from less than 0.1 mm up to 0.2 mm. The "pores" were generally lined up in a regular pattern on adjacent ridges. Overall, Krantz's observations are consistent with the generally accepted characteristics of dermal ridges and pore structure in higher primates (Moenssens 1971; Olsen 1978; Cummins and Midlo 1961). Pores can be found anywhere across the surfaces of the dermal ridges but are most often found on the midline; they may be rectangular, triangular, circular, or oval. There may be 9 to 18 pores per centimeter with diameters up to 220  $\mu\text{m}$  (0.2 mm). According to Krantz, several unnamed experts examined the casts and declared them to be those of genuine impressions left by some sort of higher primate, citing the correctness of the dermal-ridge patterns and pore structure and the difficulty in faking these details so accurately.

Upon first encountering news reports of the finding of dermal ridges and sweat pores on casts of Sasquatch footprints, we were skeptical that a medium as coarse as the typical soil could faithfully duplicate primate dermatoglyphics. We were also skeptical that the details of primate dermatoglyphics could be replicated in plaster casts, because of the tendency of plaster when mixed to the proper consistency for casting impressions to entrain masses of bubbles. We therefore decided to duplicate Krantz's Sasquatch footprints experimentally to see if dermal ridges and sweat pores could indeed be replicated in a plaster cast.

Several pounds of loess were obtained from the Geology Department of Eastern Washington University in Cheney, Washington. A representative subsample was obtained by repeated coning and quartering of the loess. The subsample was placed in a container and dampened with water. An impression of the right foot of one of the authors was made in the dampened loess; a cast of this impression was made in dental stone (sold by Ransom and Randolph Company, Maumee, Ohio). This dental stone is a highly refined plaster of paris; it is the material supplied by the U.S. Army to its investigators for the casting of tiretracks and shoeprints at the scenes of crimes.

The original footprint was examined under a stereomicroscope at magnifications from 10X to 70X. Although in many areas impressions of the dermal ridges were visible, no impressions of sweat pores could be identified. In the original footprint, the pores would appear as small elevations at the bottoms of the depressions corresponding to the dermal ridges. Because human sweat pores have limited depths, the impressions they produce may be too indistinct to be recognized.

Figure 1 is a photomicrograph of a region of the dental-stone cast of the footprint. Dermal ridges were reproduced in some areas of the cast, and numerous "pores" were found on the dermal ridges. (Some are indicated by arrows in Figure 1.) The "pores" tended to line up regularly on adjacent ridges; the diameters of the larger "pores" (approximately 120  $\mu\text{m}$ ) were well within the range reported for human sweat pores. We attempted to compare the patterns of "pores" on the cast with the patterns on an inked footprint; unfortunately, the pore structure was not adequately shown in the inked print for us to make a valid comparison. Inadequate replication of pores is a common problem with inked fingerprint impressions; Moenssens (1971) points out that the majority of fingerprint identification cards do not show pore

TABLE 1.  
Shapes and Locations of "Pores" on Cast of Human Footprint

	On Ridges			In Valleys		
	Sphere	Hemisphere	Other	Sphere	Hemisphere	Other
Analyst 1						
Area I	23	26	1	2	0	1
Area II	8	7	0	2	1	0
Area III	26	4	0	0	5	0
Total	57	37	1	4	6	1
Analyst 2						
Area I	19	0	0	3	0	0
Area II	5	14	0	0	4	0
Area III	12	11	0	0	1	0
Total	36	25	0	3	5	0

detail, either because of the use of too much ink or because the pores are too small to show up.

A microscopic examination of the shapes of the "pores" was also carried out. A real sweat pore would have a conical profile, whereas trapped air bubbles would produce spherical or hemispherical cavities. Each of us independently examined three randomly selected areas on the cast where dermal ridges were reproduced, using a stereomicroscope. In each of the areas the "pores" were classified into one of the following groups: "spheres," "hemispheres," and "other." The locations of the "pores" (on the dermal ridges or in the intervening valleys) were also noted. As may be seen from the data in Table 1, virtually all of the "pores" examined had shapes consistent with air bubbles. Cavities produced by air bubbles would be more commonly observed on the dermal ridges because cavities in the valleys between the ridges would tend to be perceived as part of the valleys. Furthermore, real pore impressions would be obscured by the welter of cavities produced by air bubbles in the dental stone.

In light of the foregoing, we feel that the "pores" observed on the dermal ridges of the casts of Sasquatch footprints are probably artifacts of the casting process and are not replications of primate sweat pores.

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