Tracking Notes
Part Two

Foot Physiology
Surfaces and Substrates

Trent Carbaugh, 2020

Some General Tracking Terms

Most field guides to tracking tend to use these terms loosely to describe things in context to a particular situation. One thing to keep in mind is inexperienced researchers often tend to confuse step and stride lengths, this should not be done, as it is like calling inches feet or vice versa, they are two distinct measurements and along with straddle width are used to determine variations in speed of travel. Speed variation can occur in relatively short distances.

Step- This is the distance between one footprint to another; left foot to right foot or right foot to left foot.

Stride- This is the distance of a full step cycle; left foot to next left foot or right foot to right foot in a track-way.

Register-This is a loose term for a footprint but is mostly used to describe when an animal steps in its own tracks making them appear to be larger or as a term to describe locomotion, example; black bears often step on their front track with the rear foot registering in the front track making it appear larger.

Straddle- Straddle is the distance between a right and left foot, in four footed animals this is usually a constant distance. In bi-pedal locomotion it is variable due to travel speed and is one of the determining factors whether something moves on four or two feet.

Gait-This term is used to describe how a subject travels, quadrupeds, four footed creatures, either walk, run, trot, or bound, example; a pine marten leaves a pattern of bounding tracks, hopping along. Bi-pedal, two footed walking, gait, is walking or running with a variable straddle, example; where the straddle of Jim's tracks gets narrower is where he started to run from the Bigfoot.

Imprint- An imprint is something that is not a footprint, but is related, such as a tail drag or a handprint. It can also be used to describe things such as the long hair on a bobcat foot that leaves an impression of fur in the track.

Scat- The droppings of an animal, size, shape and consistency of these can give you much information on what animals are active in a given area. By

close examination you can also determine food sources; deer scat may have undigested plant material, fox scat will have mammal fur mixed in. Most good field guides on tracking will have descriptions of scat for specific animals.

Sign- Another loose term that is used to describe accumulated information of something's movement and activity.

Physiology of the Sasquatch Foot

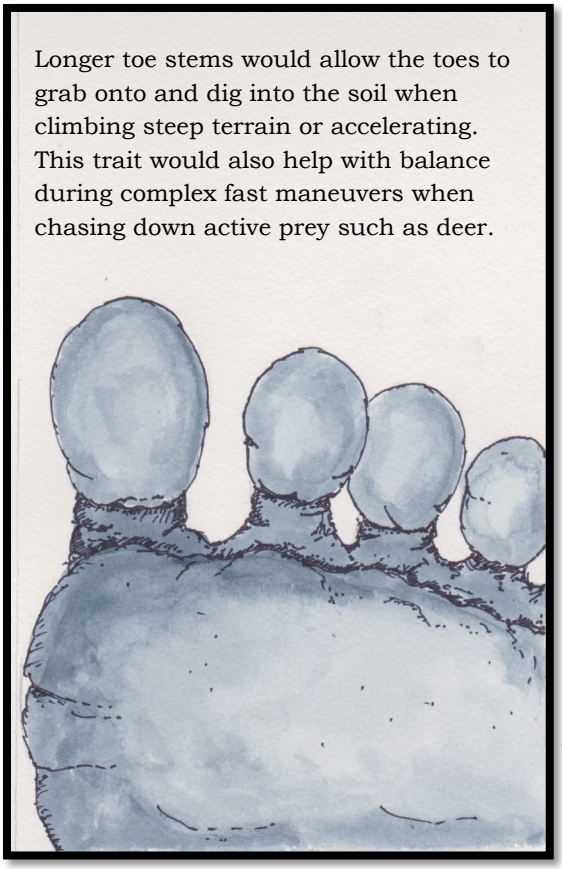
Despite the other common name of the Forest People, Bigfoot, proportionally, given their size and weight, their feet are not all that huge. Compared to a normal human foot, though, there are some big differences. The foot is wider and less tapered toes to heel, and there is usually no discernible, or a very slight, arch. The toes also splay more side to side and present a flatter profile across the front. The toe stems are longer, this is the part of the toe between the foot and the pad of an individual toe, making the toe more flexible. Longer toe stems would allow the toes to grab into looser surfaces for traction easier.

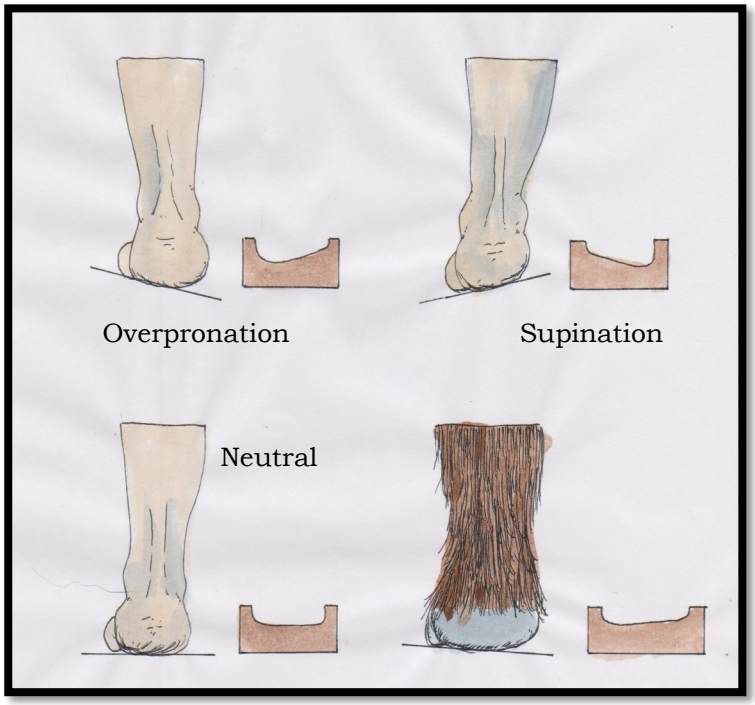
The sole of the foot seems to be more pad like, thicker, but still has the ridges and whorls of primate hands and feet. One commonly held suspicion is the soles of the feet have more blood vessels for warmth in cold conditions, like the well adapted feet of Nepali Sherpa people in the Himalayas.

Foot size and conformation

(Note that foot size information is for my local area different regions of North America show often substantial variations in size.)

Foot lengths range from 12 inches to 18 inches with the two most common lengths measured being 14 and 17 inches. There is occasionally a smattering of smaller tracks, usually in the early spring, of 8 to 10 inches, presumably of younger fellows. These tend to not be found in the late summer into the fall.

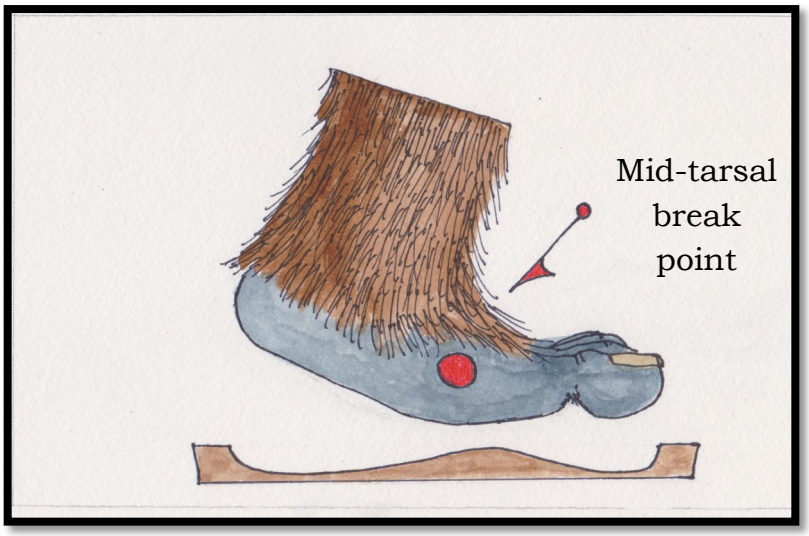




Widths tend to be proportional to the length of the foot. A 17 inch track will average 6 inches across the ball of the foot and 5 inches across the heel. A 14 inch track loses an inch proportionally from both widths.

Most tracks show no supination and a very slight pronation.

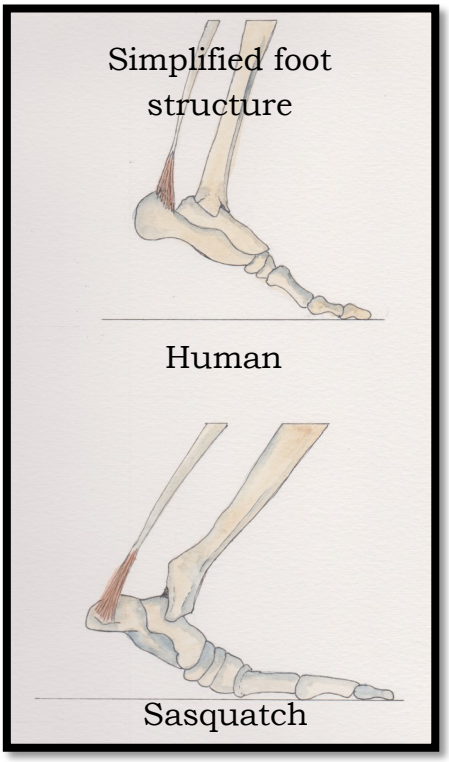
Tracks on harder surfaces show an evenness that leads me to believe that calcaneus bone in the foot (the heel bone) is longer spreading walking weight more evenly. This would effectively move the ankle and leg further into the middle of the foot. A possible reason for this could be to dramatically increase the mechanical leverage of the calf muscles to the foot allowing the burst of speed that Sasquatch are so well known for.



Mid-tarsal Break

In a very good piece of research by Dr. Jeffery Meldrum, *Evaluation of Alleged Sasquatch Footprints and Their Inferred Functional Morphology*, Dr. Meldrum shows convincingly that the foot of a Bigfoot has a joint in

the middle of the foot, where we have an arch, that lets the foot bend in the middle. This mid-tarsal break allows the Bigfoot to negotiate steep terrain faster than a human as well as making climbing things like cliffs easier. It would also allow a large Bigfoot to move very quietly through the woods the flexibility of the foot softening the footfalls.



Bigfoot prints do not always show the mid-tarsal break even when the terrain should dictate it. Uphill tracks or tracks left by a Bigfoot obviously moving at speed sometimes appear flat when you would expect to get prints from just the front of the foot. Oftentimes it appears that they have a rigid foot more like ours. Possibly this is related to travel speed or length of step or it may be something completely different. It is possible that they can lock the mid-tarsal joint for some reason but I really would not hazard a guess why except that a wide flat foot will leave less of a track in most conditions. Though this strikes me as a strange adaptation to evolve for just hiding your tracks. Some human feet are flexible enough to appear to have a mid-tarsal break. There is a more rounded shape to the ball of the foot in tracks made by these folks. This phenomenon usually occurs in people that spend much time not wearing shoes or who practice physical disciplines such as Chinese martial arts, rock climbing, or other similar practices that involve extensive stretching of the foot muscles and tendons.

Footprints and Fingerprints

Although it is rare, in some tracks you can see the lines and whorls that all primates have on their hands and feet. On our own hands and feet the lines tend to be horizontal, across palms and the soles of the feet and on the fingers and toes. In monkeys and apes the lines are generally diagonal. Sasquatch prints tend to run in straight lines front to back longwise on the feet and hands. Only primates have fingerprints.

Sasquatch fingerprints have been forensically lifted from car windows and baited food jars. Footprints will register lines and whorls in very fine dust or mud of just the right consistency.

The following example was found in the oxidation of the wood preservative on a railroad tie. Initially, walking into the area this looked like a bear track. Later, when leaving, it still looked like a bear track, but the light was different showing more detail including slight impressions of the lines and whorls on the great toe and lightly on the second toe. This track was unique in my experience as it clearly showed marks of wet hair around the outside of the foot.

Webs?

Some tracking evidence

Footprints and Fingerprints

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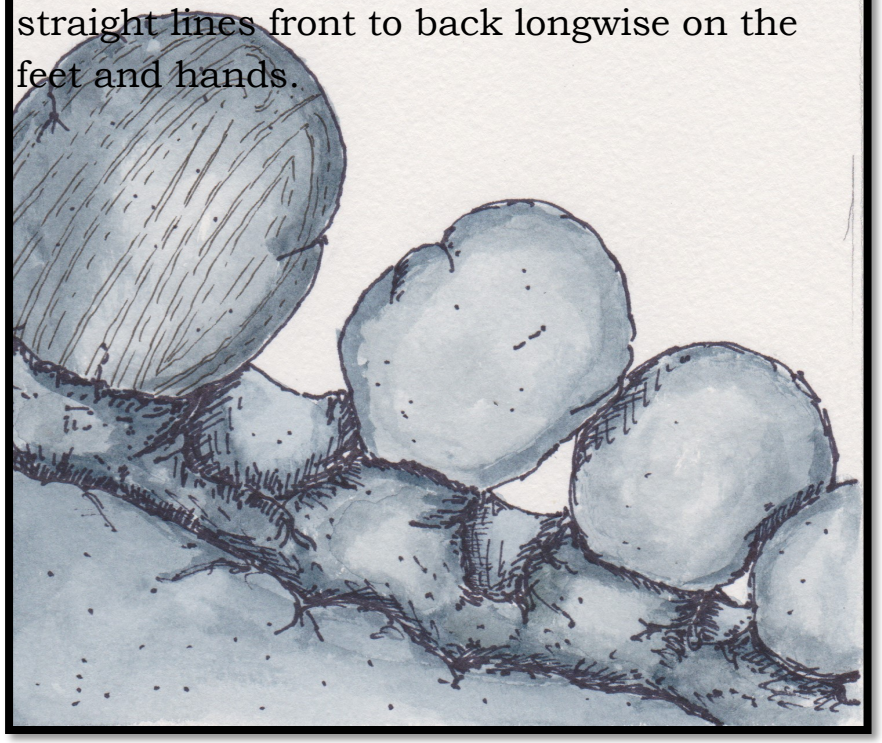

suggests that there is vestigial webbing between Sasquatch toes. This would explain the lack of mud squeezing up between the toes in many tracks in soft mud or wet soil. We have vestigial webbing between our third and fourth toes. It is speculated by some that this is an indication of a common semi-aquatic primate ancestor somewhere in our joint remote past.

Compliant gait

Compliant gait refers to the effect of observed Forest People using a stride cycle with bent knees, that is, the knees are not locked in any part of the step and stride cycle. This acts as a shock absorber reducing stress on the knees, ankles, and hips during normal walking movement and has the net effect of removing head bob when walking and the appearance of (to most humans) an unnaturally smooth walk with a high foot lift to the trailing foot. This would also possibly lessen the impact of footfalls leaving a less deeply registered track with a more even front to back depth.

The "Tightrope" Effect

Possible Sasquatch tracks in snow. Hard to tell for sure due to melting and re-freezing.

Trackways often give the appearance that the Sasquatch is walking on a "tightrope", there is very little straddle between the left and right feet in the tracks. In human tracking this is related to speed, walking produces a wider straddle measurement, running causes this distance to narrow. Human tracks at a fast run show the same effect of running on a "tightrope" like Sasquatch tracks do. The reason for this is hip rotation, the longer the step the more the hips rotate backwards and forwards causing the narrowing effect.

With our hairy friends some physiological effect works to narrow the straddle width more than in ours. This is also probably related to a narrower hip cage and the increased muscle mass needed for using a more compliant gait. It is also possible that the knees push slightly outward putting the feet physically closer together.

A Note on Size and Speed

The evidence suggests that Forest People are omnivorous carnivores, meaning a diet that includes both vegetation and meat. If you are a 7 to 8 foot tall large hairy person you will get a higher energy value for your efforts from hunting than digging for roots. This is more important if you are sharing food among a pair or family group. Being an ambush predator would be the best strategy for effective hunting by our Sasquatch. Think of this like the way a tiger hunts. Tigers are larger than their prey species, ambush prey from cover, rarely chase animals far if they miss, and use infra-sonic sound to confuse and stun prey. Tigers are highly evolved efficient predators and they are fairly well studied.

Evidence as well as some observed behavior suggest Sasquatch use the same sort of hunting technique when taking game, (possibly some others too). This is an explanation for their size as well as the development of a suspected jointed foot and longer heel bone. Size and large muscle mass allows a quick burst of speed and overwhelming power, the mid-tarsal break allows a faster acceleration and better maneuverability and a longer heel bone gives more leverage to the leg muscles. When you add the ability to use infra-sound to stun and confuse, a deer doesn't have much chance of getting away.

Energy consumption is the key thing here, if you have to expend more energy to get food than the energy you get out of it, it is a pointless exercise.

Another advantage of being built this way is short range speed. Witnesses often describe incredible bursts of speed when a Sasquatch is trying to get away. I have seen this myself, it is unbelievable how fast they can move. But, it is rare that this behavior is observed over a long distance. Usually the burst of speed gets them into cover or over a hill and out of sight quickly. It makes sense that they would get out of sight fast then slow down and use that other great skill they have of hiding. This also physiologically makes sense for their size and presumed foot construction.

For comparison we are omnivorous carnivores as well but we evolved more as pack hunters than ambush hunters. We are more like wolves than tigers. Our forbearers evolved rigid feet and a lighter body to run long distances, technology, and most importantly thought patterns that allow us to co-operate in large groups. This gave us the ability to hunt very large game to support larger groups. A mammoth feeds a lot more people than a deer.

Surfaces and Substrates

Varying weather conditions can have a very strong effect on how tracks are left and how they age. Mostly this confuses your ability to judge the age of tracks but weather can mess with the size of tracks and even the shape of them.

Normal

Track in dry leaves identified by the outline and the soil compression under the track.

I define normal conditions as when all of the averages follow an established weather pattern over years of observation. This includes normal and predictable rainfall, snowfall, and temperature ranges in a given area. This is probably the best all around condition to locate and document tracks as age of tracks and soil conditions are reasonably predictable. Leaf cover of trees as well as thickness of undergrowth over the course of the seasons will follow established patterns as will local wildlife patterns.

Dry

17 inch track in very dry conditions, identified by shape and compression.

Same track outlined for visibility.

Dry conditions usually mean it is harder to locate tracks due to the ground staying drier and harder. This is dependent on soil conditions though, often the layer of dirt under leaf cover will become dry and powdery. This can allow very good tracks to be formed with lots of definition of detail. In really good conditions dermal ridges and other details will be left especially in areas where wind has blown off the leaves in an area. One advantage of very dry conditions is that it is much easier to hear footsteps when you are being followed or stalked.

Ten inch track in mud with the toes jammed under the pine needle ground cover.

Wet

Track in wet conditions, more compression of the soil than in dry conditions.

In wet conditions it is often easy to find tracks but they very well may be deformed due to slippage of the foot. Leaves and mud can easily cause the foot to slide forward or backwards making a track appear to be much longer than it actually is. I'm not completely sure but it looks like in these conditions Bigfoot often walk more on the front of their foot to put the weight more forward on the foot for more grip with the toes. Rain will also flatten out and deform a track quickly and you should be aware that if you find good tracks in the rain they may not be very old and you should mind your surroundings.

Areas that are normally wet like stream banks and swampy areas, at least in my experience, seem to be avoided for the most part by Bigfoot as are areas of mud or rain pooling on fire roads and trails. This is not always the case but when I have found tracks in these conditions they are in areas that would not normally have much human traffic.

Tracks made in mud that is not to wet but not to dry will be the best tracks that you will find. In the right conditions tracks in mud will have incredible detail and if the tracks were made just before a dry spell they will last for a long time.

Possible trackway in wet snow on top of swampy ground.

Cold Weather

Winter conditions, without snow, are not very conducive to tracks, frozen ground does not take good impressions. There are two conditions that occur in cold weather though, that can produce excellent tracks.

Early in the winter before the ground is frozen you can get the formation of hoarfrost, this is when the water on the surface of the ground freezes forming crystals that raise the light cover on the ground upward, sometimes an inch or more above the surface. You can get excellent tracks in these conditions but they typically do not last long. It is best to look for tracks in these conditions early in the morning before the sun melts the hoarfrost.

Late in the winter, after the ground has been frozen for awhile, sunny conditions can melt the surface of frozen ground leaving a soft layer that will retain tracks well, though this surface can be quite slippery distorting tracks as well as making it hard for you to not fall over. Like dry conditions cold makes it easier to hear footsteps in the leaves if you are being followed.

Sand and Gravel

For the most part Sasquatch seem to avoid sandy patches in my research areas, of course there are very few sandy patches except around river and stream banks. Tracks in dry sand can be very hard to identify especially if there are multiple track-ways. Sand with a hard dry crust will sometimes let you identify tracks by size but will have very little detail. Wet sand can produce some extremely good tracks though with lots of detail but these conditions are rare as tracks in this kind of surface do not last long and it is the type of spot avoided by Bigfoot to conceal their movements. Note that river or stream sand is very different from construction sand. Naturally produced sand is composed of rounded grains that compact well and retain prints more accurately. Manufactured sand used for construction purposes is made from crushed sandstone and the grains have sharp edges that do not hold together as well over time. Deep construction sand will act almost like loose snow with sand

Track in a shale bed identified by size, outline and soil compression.

Likely Sasquatch track in #2 gravel on the margin of railroad tracks.

falling back into a print as it is being made whereas natural sand tends to spread out when it is deep. Not a big difference but something to be aware of. Damp construction sand, though, can take a very good track impression, though short lived.

Gravel does not take tracks well but you may find skid marks from foot slippage or rapid acceleration across graveled areas. Size of gravel also makes a difference, very fine crush and run stone is almost sand-like in size and can register tracks very well but it is typically used for trails and dirt road repair and is mechanically compressed very tightly mitigating its ability to retain tracks. At the other end of the scale is the big No.2 stone used for railroad track beds. You won't find any tracks in this stuff but if you suspect that Bigfoot are using railroad right of way for travel, look at the wooden ties for track evidence. You may see scuff marks or partial prints on the preservative layer used on the railroad ties.

Tall Grass and Low Undergrowth

In more open areas of hardwood forest as well as in small meadows you may find ground cover plants six inches to a foot tall. Tracks in this kind of cover can be easy to find but it can be very difficult to determine what made them. Suspected bipedal walking tracks in these areas can be compared to your own path through this type of cover. Look closely for more defined tracks or partial tracks in softer areas of soil. Most track-ways in this type of cover will be made by deer as their feet tend to knock down about the same amount of vegetation as a person or a Bigfoot due to the tallness of the cover and the straddle of the deer's front and back legs. Deer will often follow each other closely in this kind of more open terrain often leaving wider track-ways than you would think. Again look closely for footprints in the soil below the cover. One of those surprising things is a box tortoise crawling though this kind of cover can leave a track-way that looks very much like a bipedal track from a distance. Once you get closer you can see that the pathway is usually meandering about and sometimes if you are lucky you will find the tortoise.

Conditions in tall grass will be similar to what I have described above. Grass will often squish down better than other kinds of undergrowth and you may be able to find good outline tracks on a track-way.

In both of these cases if you suspect that what you are looking at was made by a Bigfoot follow the path to either end onto more track productive

terrain. There you may find better evidence of what produced the tracks.

Moss Beds

Moss can grow, in the right conditions, in large beds. Most humans are not heavy enough to leave discernable tracks in these areas. If they do it is where the edges of sharp boot soles or heels cut through the moss, these marks will be quite evident as to what they are. Sasquatch prints on moss can be quite clear in outline, the weight of the Sasquatch will compress the soil noticeably under the track and often the edges of the tracks will break the continuity the moss on the edges.

To be continued in part three;

Strategies for Finding Tracks and

Identifying Tracks