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Essay

MISUNDERSTANDINGS ARISING FROM TREATING THE SASQUATCH AS A SUBJECT OF CRYPTOZOOLOGY

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ABSTRACT. For a number of reasons, the inclusion of the sasquatch as a subject of cryptozoology may be inappropriate. It is suggested that the dismissal of the sasquatch to this category has more to do with unawareness of evidence for its existence as a North American mammal than the absence of such evidence. In addition, it is suggested that both the long available and recent evidence supporting the existence of the sasquatch has been ignored or misinterpreted. Foremost among the reasons for this resistance are the implications that the sasquatch, if extant, challenges prevailing knowledge. This "knowledge" portrays the sasquatch as mythical (in the narrow sense as supernatural), an imaginary or paranormal being, a misidentified bear, or merely a hoax. The unwillingness of relevant scientists to objectively scrutinize the long available evidence appears to be based on uncritical acceptance of prevailing knowledge resulting in the treatment of the sasquatch as a scientifically taboo subject. It is suggested that this treatment (or mistreatment), a subject of increasing interest, will itself become a subject of enquiry in the discipline of philosophy of science. This essay reiterates the position of a handful of scientists who take a minority position regarding the sasquatch as extant and who have attempted to bring relevant evidence to the attention of colleagues in the larger scientific community. It addresses various aspects of scientific resistance to an unfolding discovery, recognizing that the implications of this discovery claim are significant but unpalatable and unwelcome according to prevailing scientific knowledge. Consequently, a number of explanations for the prolonged nature of the discovery process with regard to the sasquatch are offered. Explanations are also offered regarding the reluctance of relevant scientists to entertain a challenge to prevailing knowledge in scientific and professional conferences. The prolonged discovery of the sasquatch may serve as a model for future discovery claims perceived as far-fetched yet eventually proven correct.

KEYWORDS: Criptids, scientific discovery, pseudoscience, ethnozoology, anomalies, forensic evidence

INTRODUCTION

Cryptozoology (literally "the study of hidden animals") refers to the study of animals considered "hidden" to science usually because of a lack of conclusive evidence of existence, or the prerequisite type specimen (Heuvelmans, 1982). The need to refine the definition of cryptozoology has been discussed by Lorenzo Rossi (unpubl. abstract). According to Rossi "cryptozoology is a branch of zoology devoted to the study and search for cryptids." Rossi defines cryptids as "potential species or subspecies of living animals [which are] not yet officially discovered and whose existence is based only on circumstantial evidence and witness statements, or material evidence considered insufficient."

Many non-scientists (and some scientists) investigating the sasquatch have referred to the sasquatch as a subject of *cryptozoology*—

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(and hence, a cryptid)—perhaps thinking that so categorizing it might confer greater legitimacy to the subject and to their efforts. But, although "cryptozoological" research may borrow techniques from recognized biological subdisciplines, like ethnozoology, it has so far failed to garner an equivalent amount of respect.

For a number of reasons the term cryptozoology has suffered from scientific prejudice. This paper addresses some of these reasons and sources of resistance. This paper also suggests that the inclusion of the North American sasquatch as a subject of cryptozoology may have been inappropriate in that an apparent lack of evidence supporting the existence of the sasquatch was actually *unawareness* of available evidence on the part of relevant scientists, or, in some cases, misinterpretation of such evidence. Because cryptozoology has commonly been categorized as a subject of pseudoscience, the consequences of being categorized as a subject of cryptozoology (i.e., a cryptid) can be particularly severe.

One of the problems with cryptozoology as a category is its attempt to embrace a wide variety of species (including mammals, birds, reptiles, and invertebrates) according to their apparent "hiddenness" or "cryptic" nature. This hiddenness, in some cases, is based merely on a current lack of evidence, lack of awareness of evidence, or apparent un-classifiability. In this sense, the unifying theme of cryptozoology may have more to do with people's perception or knowledge of certain animals than with any inherent aspects of the animals themselves. For instance, many of these species may only be considered "cryptids" because they live in remote or impenetrable habitats (and, of course, these habitats may only be "remote" and "impenetrable" from a human, or more particularly urbanized human perspective), or that their reported existence is unexpected (e.g., thought to be extinct). Since an animal's classification as a cryptid may have relatively little to do with the biological characteristics of the animal itself, biologists may find it difficult to regard cryptozoology as a true subdiscipline of zoology. It is not surprising, then, that categorizing the sasquatch as a subject of cryptozoology has apparently done little to improve its reputation among scientists, particularly when it is grouped alongside other cryptids whose possible existence is based on considerably less evidence.

The categorization of an animal as a cryptid based on its perception as anomalous and unclassifiable

There appears to be a deep-seated human need to categorize or classify a creature before there is any willingness to examine its anatomy, behavior, and ecology. Historically, the discovery of the sasquatch has suffered from problems of classification (Bindernagel, 2010). As noted in an 1891 eyewitness account from northern California (The *Daily Democrat* of Woodland, California. April 9, 1891), a sasquatch was described in a newspaper headline as "An Unheard of Monstrosity," even though the animal was initially thought to be "a man clothed in a suit of shaggy fur." Elsewhere in the article, the animal was variously described as "some kind of monstrosity," "strange creature," "unnamed animal," "non-descript," "strange beast," "creature with the strength of a gorilla," and, finally, returning to the monster theme, a "peculiar monstrosity." Even when gorillas became part of the global canon of mammals, the occurrence of a bipedal nonhuman great ape in North America remained excluded from serious consideration. Because the notion of a great ape in temperate forests of North America was deemed contrary to conventional wisdom, the evidence supporting this proposition has remained unacceptable for scientific scrutiny. Scientists have remained

largely unaware of the observed anatomical and behavioral similarities between the sasquatch and the nonhuman great apes. Especially the case for some behaviors attributed to sasquatch seemingly atypical of great apes, which turned out to anticipate the recognition of those behaviors in known great apes, such as eating fish. As a result, the sasquatch has been perceived merely as an anomaly, and this designation may have contributed to the perception of the sasquatch as unclassifiable.

Although an anomaly is objectively defined as "something which does not fit," the term is sometimes perceived as a pejorative. Philosopher of science Michael Polanyi, for example, observed that "contradictions to current scientific conceptions are often *disposed of* by calling them 'anomalies'; this is the handiest assumption in the epicyclical reserve of any theory" (emphasis added) (Polanyi, 1958).

Sociologist Ron Westrum addressed the dilemma of publicly reporting an anomaly. He suggested that "the [news] reporter looks to the opinions of the scientific community as a guide for his own treatment of reports of anomalies. Press interviews with scientists are as much for the benefit of the press as they are for the information of media consumers. And," he pointed out, "scientists can usually be counted upon to reject anomaly reports" (Westrum, 1980).

Indeed, philosopher of science Thomas Kuhn observed that "it is for the normal, not the extraordinary practice of science that professionals are trained." He noted that "the scientist who pauses to examine every anomaly he notes will seldom get significant work done." In consideration of this, Kuhn suggested that: "We therefore have to ask what it is that makes an anomaly seem worth concerted scrutiny**.**" One of the goals of this paper is to document just what it is that makes the sasquatch, an apparent anomaly, "seem worth concerted scrutiny."

Thomas Kuhn called attention to scientific awareness of an anomaly as an early stage in the discovery process:

> Discovery commences with the awareness of [an] anomaly, i.e., with the recognition that nature has somehow violated the paradigm-induced expectations that govern normal science. It then continues with a more or less extended exploration of the area of anomaly. And it closes only when the paradigm theory has been adjusted so that the anomalous has become the expected (Kuhn, 1970).

Dissection of the discovery process for the sasquatch may be useful in determining the extent to which it follows Kuhn's definition of discovery. The discovery of the sasquatch began with Aboriginal accounts and continued with the earliest published "wild man" reports. In the latter, settlers and pioneers familiar with "normal" North American wildlife species became aware that they had observed an anomaly in the form of a real (i.e., extant) but unusual animal. Such observations continued with recent eyewitness accounts of the same species, corroborated by photographs and casts of its tracks. In other words, many people observed an animal in nature that "violated"—or ran counter to—expectations regarding just which mammals existed, according to the prevailing paradigm. Paradigm-induced expectations include bears, and—as often related by the mass media—costumed humans.

However, the final stage of Kuhn's discovery process, in which paradigm theory is adjusted, has not yet occurred at this writing with respect to the sasquatch, although signs of a realignment of thought are beginning to appear. The difficulty in completing this last stage of discovery was described by historian of biomedical science Ilana Löwy, who expanded on Kuhn's ideas in a paper presented at the symposium titled *Prematurity*

in Scientific Discovery:

> The great majority of scientists, Kuhn explains, are not busy contesting accepted knowledge or falsifying major claims but instead repeat—with relatively small variants—the work of their predecessors. Moreover, scientists are organized in distinct and incommensurable communities, each shaped by a different disciplinary matrix, and they work exclusively within the framework of this matrix.
>
> Only occasionally does a great upheaval take place: old exemplars and models become invalid, well-established patterns of practice disappear, and boundaries between disciplines and specialties are redefined. Scientists then have to adapt to an entirely new way of perceiving their objects of study. Such a gestalt switch is often difficult, and a change of generation of scientists may be needed to complete the transition from the old paradigm to the new one (Lowy, 2002).

Nonetheless, one aspect of the final stage of discovery has—in a way—been partly fulfilled with regarding to this species. With over 3,000 reports of sasquatches or their tracks on file, and with over two hundred plaster casts of sasquatch tracks from various parts of North America archived in a single collection at Idaho State University, what was perceived as the anomalous has become the expected. But it is expected (or expectable) only for the few scientists who have familiarized themselves with the data and with the trace and physical evidence, and who have, in addition, tested and utilized the great ape hypothesis and found that it "works," i.e., that there is a paleontological, biogeographical, and ecological context to the existence of a North American ape; that observed anatomies and behaviors are largely consistent with those of known apes (Bindernagel, 1998; Meldrum, 2006).

The sasquatch as an anomaly: the metaphor of the Black Swan

In *The Black Swan: The Impact of the Highly Improbable*, Nassim Nicholas Taleb wrote that

> Before the discovery of Australia, people in the old world were convinced that *all* swans were white, an unassailable belief as it seemed completely confirmed by empirical evidence. The sighting of the first black swan might have been an interesting surprise for a few ornithologists (and others extremely concerned with the coloring of birds), but that is not where the significance of the story lies. It illustrates a severe limitation to our learning from observations or experience and the fragility of our knowledge. One single observation can invalidate a general statement derived from millennia of confirmatory sightings of millions of white swans. All you need is one single…black bird.

Taleb decided to use the black swan analogy to

> push one step beyond this philosophical-logical question into an empirical reality….What we call here a Black Swan (and capitalize it) is an event with the following three attributes.
>
> First, it is an *outlier*, as it lies outside the realm of regular expectations, because nothing in the past can convincingly point to its possibility. Second, it carries an extreme impact. Third, in spite of its outlier status, human nature makes us concoct explanations for its occurrence *after* the fact, making it explainable and predictable. (emphasis in original) (Taleb, 2007).

The sasquatch, still widely perceived as an anomaly (or "outlier") at this writing, remains unrecognized as an existing North American mammal species. As such it may be—

metaphorically—a Black Swan.

Leila Hadj-Chikh, one of the few scientists currently involved in sasquatch research, provides a broader perspective in which to consider the sasquatch in the history of science and our present frameworks of knowledge.

> If the sasquatch is eventually recognized as an existing species, it will be viewed as an outlier, in that it is an ape indigenous to a continent [North America] with no known fossil record of higher primates. Its presence on that continent could be explained post hoc (by citing the trans-Arctic exchange over the Bering land bridge), but it is difficult to argue that its geographic location and biological idiosyncrasies could have been predicted prior to its discovery. Its zoological uniqueness illustrates the difficulty of predicting outcomes in complex systems. In this case, predicting the sasquatch's existence would have required predicting the outcome of a complex evolutionary process that had occurred over the course of millions of years.
>
> I suppose another way in which the sasquatch would be considered a Black Swan is that it would represent a large mammal that had persisted into the twenty-first century without being officially recognized by the scientific establishment. This too would make it an outlier, and it would certainly have been hard to predict that the scientific community could ignore a species like that for so long. But, after concluding it had done so, scientists would find themselves trying to analyze how that had happened, making it "explainable," at least in retrospect (Hadj-Chikh, personal communication).

For the few scientists who, on the basis of evidence at hand, have already come to regard the sasquatch as an existing species, an attempt to understand this oversight has already begun. But while partial explanations may be found in the treatment of the sasquatch as a subject of cryptozoology (i.e., a cryptid), or as an anomaly, further explanations are revealed by examining the influence of these factors on the scientific process.

FORMS OF EVIDENCE SUPPORTING THE SASQUATCH AS EXTANT

It would be almost impossible to underestimate the significance of the unawareness of available evidence that results in the categorization the sasquatch as a cryptid. Consequently, it is relevant to briefly review the main forms of long-available evidence and why they have been ignored, diminished, or misinterpreted.

Aboriginal or Indigenous knowledge

While Aboriginal or indigenous knowledge provides the oldest form of evidence supporting the sasquatch as an extant mammal, it may also be the most misunderstood. Aboriginal descriptions of sasquatches have generally been dismissed as accounts of a mythical supernatural being, despite the inclusion of anatomical details borne out in non-Aboriginal accounts.

The occurrence of the sasquatch in the context of myth has been unfortunate in that myth is often narrowly interpreted to mean "fictitious" in contrast to its original etymology from the Greek *mythos* meaning a narrative or story. This was noted by editor W. S. Penn, in his preface to the book *The Telling of the World: Native Stories and Art*. There, he explained that he decided at the outset "that the word 'myth' not appear in the [book's] title or subtitles, not because some of these stories are not mythic, but because so many people use the word 'myth' to mean false [or] untrue (Penn, 1996).

In the past, cultural anthropologists have

often interpreted mythical to mean supernatural. Anthropologist Wayne Suttles recognized this "easy" categorization and cautioned against it:

> It is certainly true that we anthropologists have generally dumped sasquatch-like beings into a category "supernaturals" and let it go at that. We may have done this because we are professionally interested more in native culture than in the facts of zoology, but I think it is more because we are operating with too simple a version of the Western dichotomy. In fact, if we were true to our earlier, Boasian objective of describing the native culture as seen by the participants, *we ought not to categorize so freely the creatures our informants tell us about*. (emphasis added) (Suttles, 1972).

But despite the orthodox "supernatural" interpretation, at least a few published Aboriginal accounts allow for a different interpretation. For example, anthropologist T. F. McIlwraith recorded reports of the *Boq`s*, a hairy, human-shaped creature, described by the Nuxalk people of the north coast of British Columbia early in the twentieth century. In a 1925 archaeological report titled "Certain Beliefs of the Bella Coola Indians Concerning Animals," and later in his two-volume work, *The Bella Coola Indians,* he described the *Boq`s* as told to him by his Aboriginal informants:

> This beast somewhat resembles a man, its hands especially, and the region around the eyes being distinctly human. It walks on its hind legs, in a stooping posture, its long arms swinging below the knees; in height it is rather less than the average man. The entire body, except for the face, is covered with long hair, the growth being most profuse on the chest which is large, corresponding to the great strength of the animal.

McIlwraith concluded his discussion of this animal with the comments:

> The Bella Coola believe that the *boq`s*, unlike most supernatural animals, have not abandoned the country since the coming of the white man. One man was most insistent that they still lived on King Island, and promised to point one out if a visit were made to that spot. This man refuses to camp at the place where, he affirmed, *boq`s* are common. Another informant stated that though he had never seen one of the monsters, a horde of them surrounded his camp near Canoe Crossing for a week. Every night he heard them roaring and beating on trees and branches (McIlwraith, 1927).

The tendency for anthropologists such as McIlwraith to categorize the subject of such reports as "supernatural animals" is, as described by Wayne Suttles, not surprising. It must be noted, however, that the description collected and recorded in McIlwraith's report is remarkably consistent with sasquatch reports submitted by non-Aboriginal eye-witnesses in other parts of North America many decades prior to (and subsequent to) the period of his anthropological research. Although his report is no less detailed than some of the published accounts submitted by pioneers, settlers, and modern eyewitnesses, it has been treated differently on the basis of its Aboriginal origin, and the implication that, because of this context, it describes one of a number of *supernatural* animals.

This problem was identified and explained by folklorist Carole Henderson:

> The Coast Indians considered the wilderness in which they lived to be inhabited by many strange creatures, most of which can be identified as animals of nature. Others, unknown to Europeans,

> have typically, though perhaps unjustifiably, been classified as mythical supernatural beings. It cannot be proven that the Indians themselves saw these creatures as mythical, but anthropologists and other scholars have generally considered them such (Henderson, 1976).

Occasionally, aspects of the traditional accounts of the wildmen which at the time seems rather anomalous, actually anticipate behaviors of great apes not yet fully appreciated — further exemplifying the anomalous becoming the expected.

For example, the Kwakiutl, like a number of other coastal peoples, distinguish the female element of the wildman separately, as the *Dsonoqua*, who is a hair-covered giantess, with large hanging breasts, nocturnal, and fond of abducting children. The *Dsonoqua* frequently adorns totem poles and masks, and is distinguished by protruding pursed lips, indicating its whistling call.

This alleged behavior of stealing children was related by a member of an intermountain tribe, who related a traditional account of a crying child being snatched from under the wall of the teepee. Another tribal member recounted that her mother often told her and her siblings bedtime stories of the *be'a'-nu'mbe'* — the "Brother in the Woods" — in order to settle them down for the night. The mother would occasionally tell the children that if they didn't quiet down, *be'a'-nu'mbe'* would come and reach through the window to snatch them away and no one would know what had become of them. She stressed that *be'a'-nu'mbe'* was not portrayed as a monster, but rather a long lost brother, who lives in the mountains and only comes out in times of distress. There was something out there that was large and powerful and should be respected. In a similar vein, a young tribal woman who attended an evening seminar at the Idaho Museum of Natural History remarked afterward that as a child, her grandparents had warned her not to venture up certain canyons or the "monkey-man" would get her.

Such stories sound incredible and may seem akin to tales of the Bogeyman that serve as an idle reproach to misbehaving children. However, their origins may have root in real events. A former park ranger in Uganda related an incident in which a chimpanzee stole a native baby that had been parked beside the fields while its mother labored. The infant had been killed and partially eaten before the pursuing villagers could retrieve it. Ethnologist F.W.H. Migeod, while in Sierra Leon, examined a 12-year-old boy that had been attacked and badly torn by a chimpanzee, and reported this behavior in an historical account from 1926. Under the heading "Man-Killing Apes" he wrote, "This species of ape runs to a large size in Sierra Leone" and "noted for its ferocity…will without hesitation when it gets the chance attack children and run off with them with the intent to kill them." In a recent news report from Uganda, a growing number of such abductions have come to light. At least eight children have died over a seven-year period and as many were seriously injured. Dr. Michael Gavin, a conservation biologist, who documented one of the most recent incidents observed, "They [chimps] are just trying to get by. If they can't get enough food in the forest, they are going to wander out in search of what's available." It would appear the abduction of human children is a behavior not out of character for an ape. Perhaps the accounts of *Dsonoqua* and *be'a'-nu'mbe'* are more than just-so stories to encourage children to behave.

Published historical accounts

Published historical accounts of sasquatch have languished largely unscrutinized by scientists despite the wealth of anatomical and behavioral detail presented in some of them. This can be attributed in large part to the early

references to the sasquatch as a "monster" or "monstrosity"— an anomalous and un-classifiable creature, or legendary animal. An example of this is the 1891 California account referred to above, in which general descriptions of the sasquatch are as some kind of "monster."

General terms such as "monster" may have led some scientifically-minded readers to dismiss the creature as fanciful, and are at variance with the more detailed observations described by the observer in this particular account. Reading the complete article reveals that the observer had actually described the sasquatch not as a monster, but rather, resembling "a man clothed in a suit of shaggy fur," who was "about six feet high when standing." In addition, there were several anatomical features noted by the observer. These included the short thick neck of the mammal which he explained in anatomical terms: "The trapezie [trapezius] muscles were very thick." His account also referred to "its deep set eyes."

These two anatomical features allude to the apelike anatomy of the sasquatch. In addition, the observer recorded ape-like elements of behavior such as chest-beating, branch-breaking, and branch-wielding. He concluded that it was "a creature with the strength of a gorilla," alluding to its beyond-human strength which was demonstrated when "it would break off the great branches of trees that were around it, and snap them as easily as if they had been so many toothpicks. Once it pulled up a sapling five inches through at the base, and snapping it in twain."

It must be born in mind that European witnesses of the early 19th century had little knowledge or familiarity with either the nature of great apes or extinct fossil hominids. The only context for such experiences was the European tradition of wildmen – hair-covered, long-bearded figures, occasionally of giant height, wielding clubs, often depicted adorning heraldic crests and seals.

The title of this newspaper article illustrates the historical perception of the sasquatch as anomalous and unclassifiable, longstanding deterrents to its acceptance as an existing North American mammal. It also illustrates that such objections can often be overcome by a more careful reading of such historical accounts.

Recent accounts

In addition to the valuable but generally unexamined historical accounts from the 1800s, there are more recent, even contemporary accounts, which cast light on the sasquatch as readily classifiable. Such accounts, viewed within the context of modern knowledge of great apes and hominid evolution, indicate that it is clearly a primate with hominoid anatomical features and elements of behavior.

By the mid-1900s, newspaper and magazine accounts of sasquatches were becoming increasingly common and increasingly articulate in describing the detailed anatomy of the sasquatch. For example, there is the 1956 British Columbia account of William Roe, which begins with his assumption that he was observing a bear (Figs. 1 and 2):

> Then I saw it was not a bear….My first impression was of a huge man…almost three feet wide….But as it came closer I saw by its breasts that it was female.
>
> And yet its torso was not curved like a female's. Its broad frame was straight from shoulder to hip. Its arms were much thicker than a man's arms, and longer, reaching almost to its knees. Its feet were broader proportionately than a man's….
>
> The nose was broad and flat. The lips and chin protruded farther than its nose. But the hair that covered it…made it resemble an animal as much as a human….and its neck was also unhuman,

> thicker and shorter than any man's I had ever seen (Green, 1968).

More recently, in a 1982 account from Northern Ontario, a moose hunter described the anatomical features of a sasquatch which first intimidated him by club-wielding and rock-throwing, and then revealed itself when it stepped onto the same logging road on which the hunter was walking:

> It was big—seven or eight feet tall. Its legs were short, but its arms were long. They hung down to its legs. Its shoulders were wide. The sides of the neck went straight up to the head. Its head was rounded. Its hair was dark, not jet black but sort of a brownish-black.…It walked on two feet, upright, just like a man. I couldn't see its face because it was walking away from me.

He later backtracked the animal from where it had come out of the bush:

> The tracks were big, at least a foot long, and had five toes just like a human. I noticed they were square across the toes, not slanted towards the little toe like in a human foot. They were more straight across. The heel and toes made an imprint, even in the dry ground.

The moose hunter's report is of particular interest because it describes two unique elements of sasquatch intimidation behavior: the brandishing of a tree limb as a club and the throwing of rocks in his direction.

Even if the certitude of the observations of experienced eyewitness is questioned, such accounts will eventually be recognized as having pointed the way, of guiding a handful of open-minded scientists and other readers to the possibility of an existing bipedal hominoid in North America, and to the need for further study. Moreover, they also point to its primate nature based on reported anatomical features and elements of behavior.

Corroboration of tracks

In addition, the documentation of its tracks in photographs and casts affirms its existence as a track-leaving North American mammal. Such track casts not only affirm the existence of the sasquatch as a track-leaving mammal, but provide opportunities for further anatomical study of the sasquatch foot, study which reveal aspects of its apelike nature.

Numerous petroglyphs of humanoid footprints have been documented across the North American continent. These have generally been assumed by the archeologists to depict human feet or footprints. However many can be recognized by the very distinctions that appear to differentiate tracks attributed to sasquatch from those of humans, i.e. broad heel, archless midfoot, more subequal toe pads disposed more squarely across the foot. A remarkable stone carving of a foot resides in a museum in British Columbia. What has been taken as merely stylized representation again appears to depict quite accurate anatomical details of the very distinguishing features attributed to the sasquatch foot.

The photographing and casting of sasquatch tracks beginning in the mid-1900s was an enormous step forward in corroborating eyewitness descriptions, especially those in which the broad flexible foot of the sasquatch had been noted and described. Track casts especially are a permanent form of track evidence. Unfortunately the cast of the first sasquatch track known to have been cast has been lost but a tracing of it survives (Fig. 3). A few track casts, however, date back the 1950s and a plethora of sasquatch tracks were cast during the 1970s and 1980s.

The process continues at present as the importance of this form of evidence is increasingly being recognized. An archive

consisting of virtual footprints from 3-D scans of casts of 3D scans of casts of footprints attributed to sasquatch, is being assembled at the Idaho Virtualization Laboratory of Idaho State University. The archive will make this body of evidence accessible to serious researchers (Fig. 4).

A degree of formal acknowledgement of the significance of the footprint evidence came when the conventions of ichnotaxonomy (the naming of footprints left by an unknown trackmaker) were applied to these data. The nomen *Anthropoidipes ameriborealis* MELDRUM 2007 applies to the tracks attributed to sasquatch, according to the following:

> **Diagnosis**: Plantigrade, pentadactyl, entaxonic, elongate footprints of a hominoid biped, that differ from *Homo sapiens* footprints in their larger absolute size, greater relative breadth, elongated heel segment, lack of a longitudinal arch and evidence of midfoot flexibility.
>
> **Description:** Large, plantigrade, pentadactyl, entaxonic, elongate footprints of a hominoid biped. Footprint is flat, lacking a fixed longitudinal arch typical of human footprints. Frequently, indication of a transverse axis of flexion at midfoot present, occasionally producing a midtarsal pressure release ridge or disc. Ball is poorly differentiated from surrounding forefoot; rarely transected by a flexion crease, if sole pad extends sufficiently distal beneath proximal phalanges. Widest part of the foot lies at inferred position of metatarsal heads. Heel is elongate, broad and rounded. Relative breadth-to-length ratio exceeds that of human footprints. Deepest part of the footprint often beneath the forefoot; lacking evidence of distinct heel-strike typical of human striding gait. Digit impressions are short and rounded to elongate ovals; toe stems often visible when digits extended. Digit I approximately 50% wider than digits II-V; digits II – V more subequal than human toe row; digit I typically most distally projecting, although occasionally digit II is equally long or more distally projecting. Step length generally greater than 2.5 times foot length (Meldrum, 2007).

Unfortunately, the uncritical acceptance of claims of track hoaxing based on crudely carved wooden feet appears to have dissuaded most relevant scientists from scrutinizing actual sasquatch track casts. In the face of this scientific resistance on the part of the larger scientific community, only a small cohort of scientists has recognized the importance and implications of the track evidence.

Hair evidence

Footprints constitute trace evidence, however hair is physical evidence. It originates from a physical biological entity. A collection of hair samples that defy attribution to known wildlife species exhibit a consistent suite of morphological characteristics:

> Mean diameter 65 *u*m; cross-section round to slightly flattened; medulla absent; cuticle irregularly waved mosaic; scale distance intermediate, margins smooth to mildly crenulate; color varies with proportion of pheomelanin to eumelanin, from reddish blonde to mahogany black.

These samples clearly exhibit primate characteristics and in many regards are very similar to human hair. Herein lies the challenge. Their similarity to human hair makes definitive identification as an unknown elusive. It permits a superficial dismissiveness of the potential evidence by skeptical scientists. Only quite recently have advances in DNA extraction and sequencing techniques made the prospects of successful genetic discrimination more likely. Even then a

negative result is perceived as evidence that sasquatch does not exist, rather than a conclusion that an unidentified hair sample did not come from an unknown species of hominoid. Stray hair fibers are ubiquitous in the environment and indiscriminant sampling in association with an alleged encounter with sasquatch provides no certitude that the hair sample originated from the entity in question.

Photographic evidence

Capturing quality photos, films or videos of wildlife is challenging in nearly any natural setting. It is even more challenging when the target species is largely nocturnal, solitary, far-ranging, generalized in its behavior and diet, and intelligent. Since no professional photographers have undertaken the objective of capturing an image of the sasquatch, it is hardly unexpected that alleged pictures of the sasquatch would be rare and of marginal quality.

The most notorious exception is the Patterson-Gimlin film, less than a minute of 16mm film shot along northern California's Bluff Creek in 1967. After 45 years it remains the most compelling and the most contested piece of photographic evidence purporting to depict a sasquatch. In spite of rumored accomplices, a supposed death-bed confession and charges of a case of a "man-in-a-fur-suit," the film has withstood ever increasingly sophisticated analyses by the few experts willing to objectively examine it. Still the accepted consensus of the scientific community is that it *must* be a hoax.

Given the prejudice, or at ambivalence, toward this Patterson-Gimlin film, which set the bar exceptionally high early on, it is clear that anything short of that mark would have little impact on a skeptical scientific community. And yet when the best of the brief snippets of various videos are reviewed systematically, the best contenders present a remarkably consistent suite of criteria that echo the most compelling aspects of the Patterson-Gimlin film. The proliferation of these marginal videos addresses the critical question, Why in this age of smart phones and palmcorders hasn't someone got a picture of sasquatch? In fact many may well have, but it is hardly surprising that most amateur photographers rarely have the skill, let alone the composure to capture a convincing still photograph or video when encountering such an unexpected creature.

REASONS FOR UNAWARENESS OF EVIDENCE

Unawareness of evidence as a source of resistance may appear at first glance to be a simplistic explanation. Nevertheless, medical historian Ernest Hook explained that among the five reasons that some scientists may reject a hypothesis at first offering, the first and most obvious is simply that "they are unaware of it." (Hook, 2002). Unawareness is particularly important in the discovery process of the sasquatch because it is both a source of resistance and a result of resistance. It is recognized here as a particularly important source of resistance to perceiving the sasquatch problem as a scientific problem and to its being categorized as a cryptid. Two obvious questions regarding unawareness are: (1) Why have scientists been unaware of the evidence? and (2) Why has this unawareness persisted so long?

Undue reliance on authoritative opinion

As noted by philosopher of science Michael Polanyi,

> The amount of knowledge which we can justify from evidence directly available to us can never be large. The overwhelming proportion of our factual beliefs continue therefore to be held at second hand through trusting others, and in the great majority of cases our trust is placed in the authority of

> comparatively few people of widely acknowledged standing (Polanyi, 1958).

Philosophers Theodore Schick Jr. and Lewis Vaughn further explain and justify such reliance on expert evaluation of evidence:

> We should not defer to the experts because they are always right—they aren't. But they are more likely to be right than we are. One reason they are usually right is that they are usually privy to more information than we are. Another reason is that they are usually better judges of that information than we are (Schick and Vaughn, 1995).

In the case of the sasquatch, it has become clear that most experts—relevant scientists such as primatologists, mammalogists, and wildlife biologists—are *not* aware of and *not* privy to the results of sasquatch research. A university biologist once explained to a reporter why he dismissed the sasquatch as merely a "story:" "People believe in these things because they like to believe in them, and it keeps on going because people like it. And why not? It's a charming story." (Watts, 1994).

Because of such attitudes and opinions, the statements of academics on this subject may not be as authoritative as they are sometimes perceived. Weighing the value of authoritative opinions, Galileo once wrote that: "In science the authority of the opinion of a thousand is not worth as much as a spark of reason in one man."

But, of course, in challenging the opinion of authorities, proponents of controversial hypotheses should not mistake scientific resistance for persecution, and even if some were to perceive it that way, it would not absolve them from the responsibility of proving their case. As Stephen Jay Gould once remarked: "A man does not attain the status of Galileo merely because he is persecuted, he must also be right." (Gould, 1977).

CRYPTOZOOLOGY AND PSEUDOSCIENCE

Pseudoscience ("false science") normally refers to science conducted improperly, i.e., *un*scientifically, in which case methodology or reasoning is treated as scientific when in fact it is not. Astronomer Carl Sagan compared science and pseudoscience:

> Pseudoscience differs from erroneous science. Science thrives on errors, cutting them away one by one. False conclusions are drawn all the time, but they are drawn tentatively. Hypotheses are framed so they are capable of being disproved. A succession of alternative hypotheses is confronted by experiment and observation. Science gropes and staggers toward improved understanding. Proprietary feelings are of course offended when a scientific hypothesis is disproved, but such disproofs are recognized as central to the scientific enterprise.
>
> Pseudoscience is just the opposite. Hypotheses are often framed precisely so they are invulnerable to any experiment that offers a prospect of disproof, so even in principle they cannot be invalidated. Practitioners are defensive and wary. Skeptical scrutiny is opposed. When the pseudoscientific hypothesis fails to catch fire with scientists, conspiracies to suppress it are deduced (Sagan, 1995).

In *The Scientific Endeavor*: *A primer on scientific principles and practice*, geographer Jeffrey Lee notably associated pseudoscience with amateur research and a lack of peer review:

> Pseudoscientists…attack scientific orthodoxy from outside the system. Typically they have little training in, and often a flawed comprehension of the topic they study. They also tend to present their ideas

> directly to the general public, most of whom have little understanding of science. By skipping the peer review system of scientists it is often easy to publish [heretical] ideas (Lee, 2000).

But many scientists have applied the term pseudoscience to subjects such as the sasquatch as if such subjects are, by their very nature, pseudoscientific and not amenable to scientific study.

Examples of this are provided by both Jeffrey Lee and Carl Sagan. Lee described his understanding of cryptozoology as

> the study of mythical creatures which have not yet been identified by science. These include Bigfoot (also called Sasquatch), Yeti (or the Abominable Snowman), and the Loch Ness Monster. Much like UFOs, these creatures may exist but the evidence is insufficient to warrant acceptance of them as real (Lee, 2000).

Elsewhere in *The Scientific Endeavor*, Lee included cryptozoology along with "astrology, dowsing, UFOs, paranormal phenomena, graphology, Atlantis and the Bermuda triangle" as subjects of pseudoscience.

Lee's categorizing of cryptozoology as an example of pseudoscience is apparently shared by astronomer Carl Sagan, who noted that:

> Typical offerings of pseudoscience and superstition—this is merely a representtative, not a comprehensive list—are astrology; the Bermuda triangle, "Big Foot" and the Loch Ness monster; ghosts; the "evil eye"; …extrasensory perception (ESP), such as telepathy, precognition, telekinesis, and "remote viewing" of distant places; the belief that 13 is an "unlucky" number (Sagan, 1995).

He noted, in addition, that

> Each field of science has its own complement of pseudoscience. Geophysicists have flat Earths, hollow Earths, with wildly bobbing axes to contend with, rapidly rising and sinking continents, plus earthquake prophets. Botanists have plants whose passionate emotional lives can be monitored with lie detectors, anthropologists have surviving ape-men, zoologists have extant dinosaurs, and evolutionary biologists have Biblical literalists snapping at their flanks (Sagan, 1995).

It appears that both Jeffrey Lee and Carl Sagan may have categorized the sasquatch (or Bigfoot) as a subject of pseudoscience largely on the basis of whether or not it has been scientifically or unscientifically treated, allowing past treatment of the subject by some amateur investigators and by the mass media to define the merits or deficiencies of the subject itself. But they may also have been largely unaware of the far-reaching power of scientific gatekeepers in the peer-review process with regard to this taboo subject. Such treatment may have erroneously prejudiced other scientists from pursuing a scientific study of such subjects.

Ironically, it has been decisions made by scientists themselves that have been largely responsible for the situation in which sasquatch investigation has been primarily undertaken by untrained amateurs. While this, by itself, may not necessarily have resulted in pseudoscientific treatment of the subject, there may have been an increased possibility of this occurring. Some investigators of the North American sasquatch may have proceeded with sasquatch investigation in a non-scientific (or pseudoscientific) manner, especially regarding interpretation of observations. Lapses in organization, methodology, and interpretation were targeted in two recent books aimed at discrediting sasquatch research as pseudoscience (Buhs, 2008; McLeod, 2008).

But there are also scientists who challenge the premature designation of certain subjects as "pseudoscience." In his book *At the Fringes of Science,* physicist Michael W. Friedlander addressed the problem of how new ideas are perceived and treated by the scientific community. He observed that "it is scientists whose opinions are going to determine what is welcomed and then incorporated as new components of science or be rejected as erroneous or pseudoscientific." He suggested that even if a theoretical basis for a claim was lacking, this might not justify ignoring evidence:

> Pseudoscientific claims are often rejected because they have no theoretical foundation. This objection is not always valid.…It is the reality and correctness of the observations that must be examined, and the theory will follow in due course if the observations are correct (Friedlander, 1995).

Citing his own experience in particle physics, Friedlander recalled that "our particle discoveries were totally independent of any theory. There was no theory, no paradigm to guide us." He observed that "as new fields open through accidental discoveries, there may be no theory to support them."

A recent mammal discovery: the okapi

The okapi is of special interest to cryptozoologists because of its emblematic status as a logo image for *Cryptozology*, the journal for the International Society for Cryptozoology, a status related to its late discovery and the confused discovery process leading up to its recognition. The okapi (*Okapia johnstoni*), is a central African forest mammal best known for its close relationship to the giraffe (*Giraffa camelopardalis*), despite its dissimilar appearance and preference for dense forest habitat. Its discovery provides additional insight into the process of acknowledging a "new" mammal species, which was formally recognized relatively recently in historical terms.

Although the okapi is generally considered to have been discovered in 1901 when it became known to western science, it may have been documented by the ancient Persians. An animal depicted by the Persians in a frieze or bas-relief in the ruins of the temples of Persepolis, which date back to approximately 515 BCE, strongly resembles the okapi (Fig. 5). Despite this resemblance, not all scientists are in agreement regarding the identity of this depiction.

During the discovery—or rediscovery—of the okapi by western science in the late 1800s, it was misclassified several times, first as an antelope, then as a donkey, then—because of its stripes—as a "forest zebra," before it was finally recognized—*after* its official discovery—as a close relative of the giraffe.

An interesting stage in the okapi discovery process occurred while Sir Harry Johnson, now recognized as its discoverer, was being guided by local Africans. When he first observed the cloven-hoofed tracks of the okapi he found them inconsistent with his expectations. Perhaps basing his expectations on the name "forest zebra," he had anticipated tracks resulting from single-toed hooves (such as those of a perrisodactyl), rather than the tracks of a cloven-hoofed animal related to the even-toed ungulates (artiodactyl) such as cattle, buffalo, antelopes, and giraffes. Consequently, according to Lindsey et al., "he suspected that the Mbuti [guides] might be misleading him intentionally."

When the okapi was described in Europe around 1900—initially on the basis of drawings and two bandoliers made from the skin of an okapi—it was greeted with skepticism and disbelief. As noted by Susan Lyndaker Lindsey and her colleagues in *The Okapi: Mysterious Animal of Congo-Zaire*:

> Newspapers soon circulated the news that evidence of a new, large, living animal had been discovered in Africa. Rumors and speculations began to fly across Europe and America. Was this a concocted tale? Was this animal a hoax? How could an animal this large go undetected for so long?

The authors noted that there was additional speculation:

> If the stories were true, what kind of an animal could it be?…Could it be the fabled unicorn, mentioned in ancient Greek and Roman writings? Some thought it might be a "missing link" to an ancient animal that lived thousands of years ago (Lindsey et al., 1999).

The discovery of the sasquatch shares a number of commonalities with previous zoological discoveries. These include: (1) a prolonged discovery process, (2) the ascription of supernatural attributes to an undiscovered mammal (for example, the gorilla), and (3) repeated misidentifications of a recently discovered animal based on an initial inability to classify the animal correctly. With respect to the okapi, it also illustrates, in addition, the suspicion of a hoax.

Overemphasis on unavailable evidence

Scientific gatekeepers have frequently requested forms of evidence which appear to be unavailable or missing, rather than admitting for scrutiny the evidence which *is* available. This attitude was echoed in the statements of skeptic Michael Shermer, who opined that the science starts when you have a body (Shermer, 2003). Similarly, when challenged concerning what evidence was worthy of objective consideration, skeptic Benjamin Radford responded—a body. There is this disconnect from the process of discovery —a leap to a requirement of conclusive proof, while dismissing all evidence presently available *a priori*.

One form of "missing" evidence raised is fossil evidence. The possibility that an animal known only from the fossil record is discovered to be extant millions of years later is not nearly as unlikely as it may first appear. It is general knowledge that the coelacanth, a fish previously known only from fossil evidence, was found to be to be extant in 1938, revealing a gap in the known fossil record of over 65 million years. The "patchiness" of the fossil record is especially well recognized by paleoanthropologists, who are aware of how much chance has played a part in not only the fossilization process but also in the discovery of fossil remains.

DNA evidence is another form of evidence not yet available for the sasquatch at this writing. There are several reasons for this, one being that it has only recently been possible to conduct DNA testing. Some eyewitness accounts suggest that significant opportunities to collect DNA have arisen in the past, but eyewitnesses were obviously unaware at the time that such samples could be used for future DNA analysis.

When the committee reviewing papers for presentation at a 2002 international ape conference rejected a paper illustrating evidence for the North American sasquatch, the reason given was that until there is conclusive DNA evidence for the existence of the sasquatch, conference organizers were unwilling to include a paper on this subject. The review committee concluded that papers would be restricted to the known ape taxa of Africa and Asia: gorillas, chimpanzees, orangutans, bonobos, and gibbons.

Scientific gatekeepers, by demanding thus-far-unavailable forms of evidence—such as DNA or a body—rather than admitting trace evidence that *is* available for scrutiny, may have impeded examination of available evidence. Such scrutiny could actually have improved the likelihood of acquiring DNA

evidence, by potentially generating a greater level of interest in sasquatch evidence within the scientific community. This in turn could have helped address some of the problems faced until recently in acquiring DNA evidence, such as poor sampling protocols, and limited interest among molecular biologists in analyzing possible sasquatch DNA samples.

Furthermore, the inability to apprise scientific colleagues of important evidence may have enhanced the perceived validity of the hoax hypothesis**.** Scientists may incorrectly equate the lack of particular forms of evidence with a general lack of evidence supporting the sasquatch as extant. The misconception that no evidence exists to refute hoax claims may have significant consequences.

As philosophers Theodore Schick, Jr. and Lewis Vaughn noted:

> There are those…who measure the credibility of a claim, not in terms of the evidence in its favor, but in terms of the lack of evidence against it. They argue that since there is no evidence refuting their position, it must be true. Although such arguments have psychological appeal, they are logically fallacious. Their conclusions don't follow from their premises because a lack of evidence is no evidence at all. Arguments of this type are said to commit the *fallacy of appeal to ignorance*....All a lack of evidence shows is our own ignorance; it doesn't provide a reason for believing anything.
>
> A claim's truth is established by the amount of evidence in its *favor*, not by the lack of evidence against it (Schick and Vaughn, 1995).

Philosopher Irving Copi provided a more formal description of this fallacy:

> Those who focus on forms of evidence that are not available commit the fallacy of *argumentum ad ignorantiam* (argument from ignorance). The fallacy of *argumentum ad ignorantiam* is committed whenever it is argued that a proposition is true simply on the basis that it has not been proved false, or that it is false because it has not been proved true. But our ignorance of how to prove or disprove a proposition clearly does not establish either the truth or the falsehood of that proposition.

This suggests that competing hypotheses should be weighed against each other based on the evidence which does exist in their favor, rather than by forming conclusions based on what evidence is absent. Nonetheless, as noted by Copi, "it is curious how many of the most enlightened people are prone to this fallacy (Copi, 1982).

These comments identify the need for scientists to become more aware of the available evidence which *supports* the existence of the sasquatch, rather than continuing to uncritically—and perhaps fallaciously—accept hoax claims as an explanation for all sasquatch accounts.

The authors have experienced frequent rejection of abstracts addressing these various evidences, when submitted to professional venues. In one instance a dissenting reviewer offered this as rationale for rejection – "This subject is not of general interest to the anthropological community." These are instances of gatekeepers restricting the dissemination of technical evaluation of evidence through conventional channels of the scientific community. In contrast, on those occasions that abstracts have been accepted and opportunity afforded to present finding in professional scientific venues, the reception by many colleagues has been enthusiastic, while betraying the very level of unawareness we have been describing here.

To address this situation, a scholarly refereed journal, *The Relict Hominoid Inquiry*

(www.isu.edu/rhi) has been established (2012) to provide a venue for objective review and publication of manuscripts dealing with the subject of potential relict hominoids globally, and thereby distinguishing it from general submersion within crptozoology.

The theme of the journal is beginning to gain traction in the scientific community. The growing fossil record of hominoid evolution attests to the contemporaneity of multiple species throughout the past. Furthermore ongoing discoveries indicate the recent persistence of a number of lineages. Given this situation the possibility of relict populations of diverse hominoid species in various corners of the globe, including a relict population of large North American apes, is hardly so "far-fetched" as was once perceived (Meldrum, 2012a). The notion that *Homo sapiens* is the last hominin standing cannot be taken for granted. In recognition of this development, *New Scientist* devoted a cover story to the theme of the ten biggest puzzles of human evolution today. One of these puzzling questions for future research is "Are other hominins alive today?" (Meldrum, 2012b).

DISCUSSION

In summary, the term cryptozoology, as it has been commonly used, may have been a hindrance to the acceptability by relevant scientists regarding some entities categorized as cryptids. Such categorization has resulted in the treatment of such as subjects unrelated to other biological species. Their pursuit by non-scientists, who have sometimes assigned paranormal attributes to cryptids, may have exacerbated this. Indeed Lorenzo Rossi has lamented how cryptozoology has acquired a reputation for being "the study of fantastic creatures for which no empirical evidence exists." He notes that "many among the most famous exponents of cryptozoology continue to spread this image…through websites and books with little or no scientific value."

Consequently, it is suggested that the term cryptozoology (and cryptid) be used cautiously and applied sparingly in connection with sasquatch , and other relict hominoids. In particular, it should be determined whether or not there is an actual paucity of evidence supporting the existence of the species in question, or whether the apparent lack of evidence is merely the result of unawareness or misinterpretation of such evidence, as appears to have been the case for the sasquatch for many decades. Increased exposure and dissemination of scholarly treatment of the existing evidence and more methodical documentation and collection of evidence in the field are critical steps in overcoming the preconceptions and ingrained unawareness that prevails.

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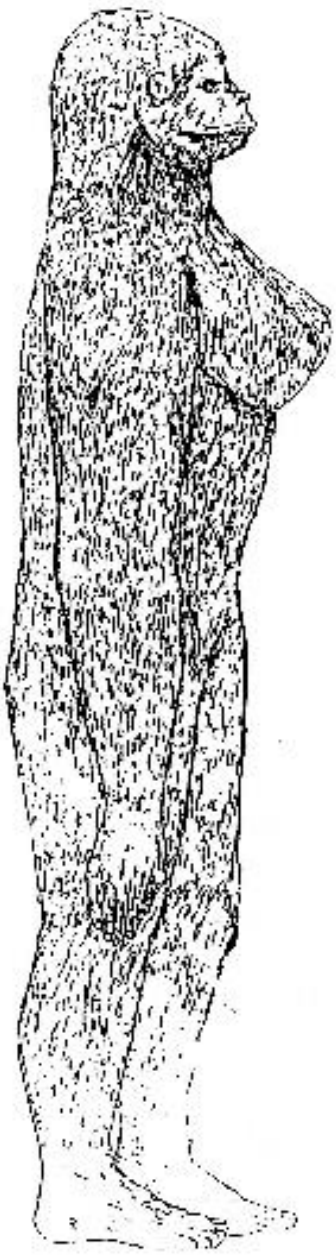

Figure 1. This drawing was done by observer William Roe's daughter on his instructions. Note the long arms, flat nose, prognathic jaw, and receding forehead.

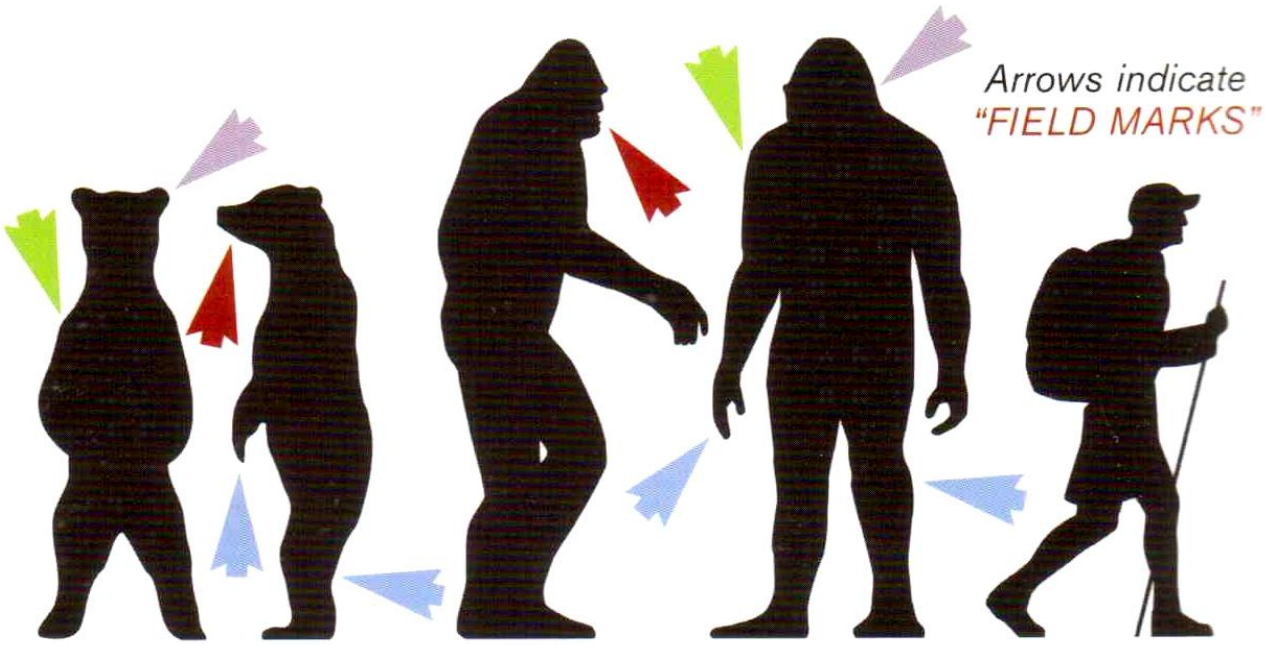

Figure 2. Field guide drawings of an upright black bear (left) and sasquatch (middle, based on eyewitness descriptions) and a human hiker (right). Note the distinguishing field marks, especially the squarish shoulders of the sasquatch compared with the tapered shoulders of the bear, and, in profile, the flat face of the sasquatch compared with the prominent snout of the bear; the placement of the ears and the contrasting limb proportions. The human figure typically distinguished by the common accessories: pack, walking stick, hat; clothing.

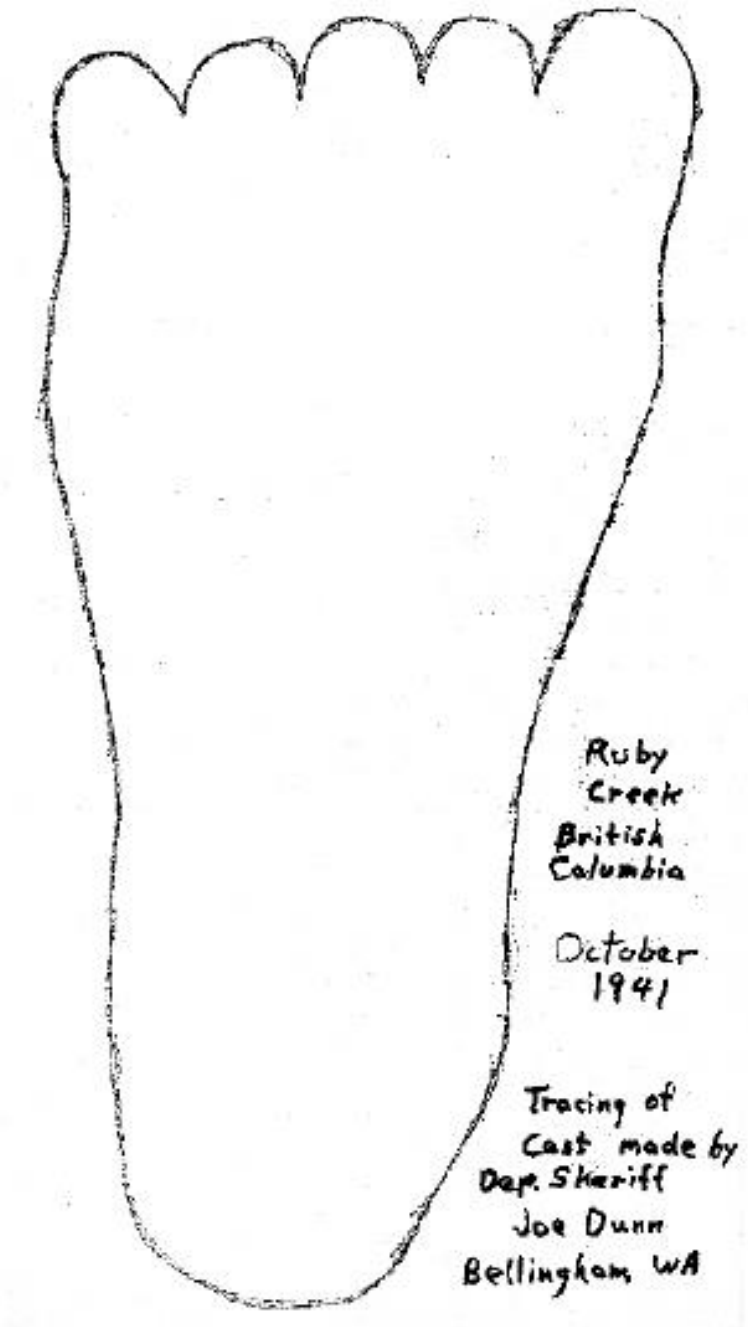

Figure 3. Tracing of the earliest known sasquatch track cast, made in 1941 in southern British Columbia. Note the very broad flat footprint with comparatively subequal toes aligned rather straight along the leading edge of the foot—common anatomical features of sasquatch tracks.

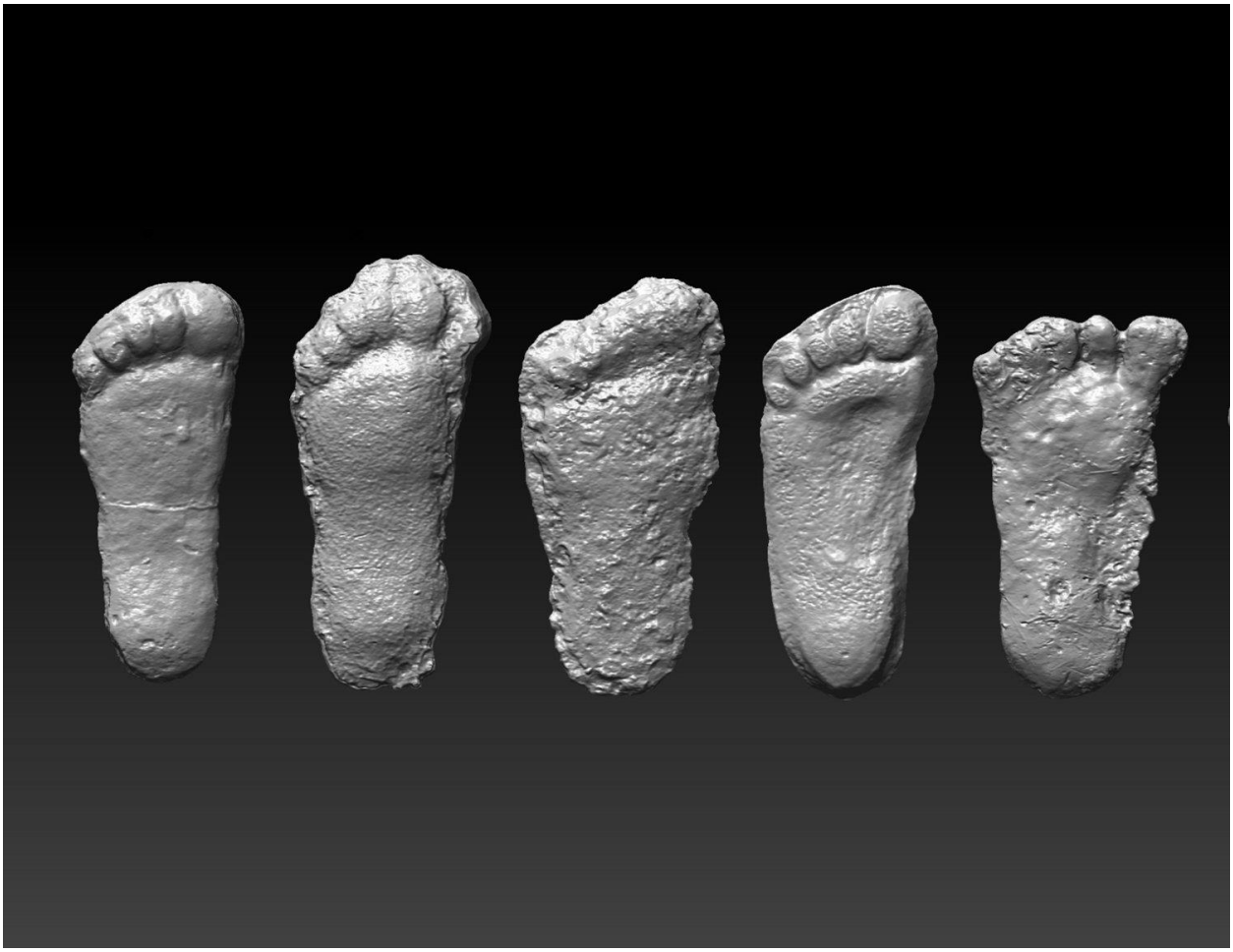

Figure 4. Three-Dimensional scans of examples of sasquatch footprint casts from the western United States and Canada (credit: IVL).

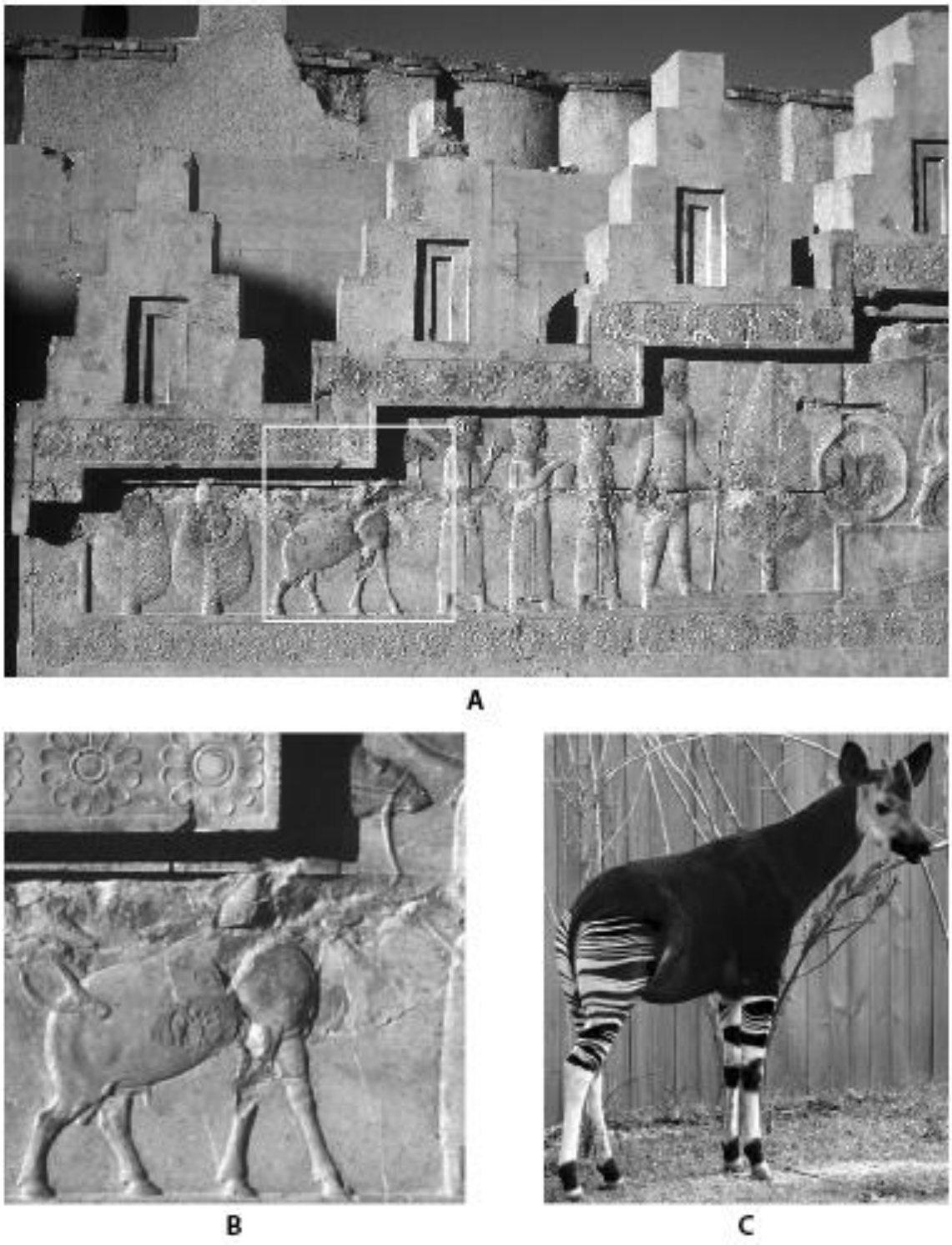

Figure 5. A bas relief of what appears to be an Okapi in the ruins of Persepolis in Iran (formerly Persia), dating from circa 513 BCE (A and detail in B; Lindsey et al., 1999); An Okapi (*Okapia johnstoni*) in a zoo (C; credit: Lewis Hall).