3. The heel is actually seen to be sticking out in an inhuman way in some frames, suggesting an unusually large heel bone (calcaneus) as has been predicted by Grover Krantz using theoretical considerations and the evidence of the footprints. That the heel of the filmed subject is really unusual is testified to by the fact that this feature was independently discovered in Moscow and Ottawa. In Moscow it was seen by Bayanov and Bourtsev as "an omen of the creature's reality" (Hunter and Dahinden 1973:178). In Ottawa a scientist of the Canadian National Museum rejected the film because he saw "a human heel under the skin of the creature as it walked. . ." (Ibid.:124). The "skin of the creature" in this case being a euphemism for the notorious "monkey suit," we infer from this statement that for a human heel to stick out from its normal dimension to the extent shown in the film there must be something terribly wrong either with the "monkey suit" or with the heel. Since nobody has yet detected any flaw in the former, the latter seems the only alternative. Thus it is up to the viewer to make up his or her mind whether the protruding heel, as seen in frame 324, is an abnormal human heel, or a normal Sasquatch heel. It is worth pointing out also that this peculiarity has never been reported by eye-witnesses because it appears only for a fleeting moment when the Achilles tendon is not tight in a certain phase of the stride.

Some Conclusions

The creature of the Patterson movie by its size and appearance perfectly fits our notion of the Sasquatch. In fact, almost all parts of its body, which are visible in the film, match the data of the eyewitness and footprint evidence. The few features that have not been reported by witnesses are equally significant for at least two reasons: for one, they are consistent with the overall morphology of the creature and the mechanics of its locomotion (the latter will be shown below); for two, they are inconspicuous enough to have escaped the attention of chance observers, but prominent enough to catch the scrutinizing eye of film analysts.

The specimen's morphology is in agreement not only with the witness and footprint evidence, but also with the data of paleoanthropology.

The Specimen's Movements

The great advantage of a movie is in its ability to "catch" and render movement. The whole "scenario" of the Patterson film

consists of one short scene wherein the film star never stays put. This happy circumstance gives us no less information as to the nature of the analyzed creature than its morphology does.

The method which we used to find the framing speed of the movie simultaneously allowed us to fix and analyze every step and movement both of the creature and the filmmaker.

The finding of the filming speed (16 fps) also allowed us to establish the time length of the filmed encounter with the creature: the number of frames in the film (951) divided by the figure of the framing speed (16) equals 60 seconds.

In the course of these momentous 60 seconds the creature is seen to perform a variety of movements, most of which can be embraced by the notion of walking. One way of distinguishing walking from running is: in walking the body keeps in touch with the ground either with one or both feet, whereas in running it is on and off the ground with every stride. The frames showing the feet of the creature testify to its walking, not running. The specimen's walk has been analyzed by two specialists in the discipline of biomechanics, Dr. Don Grieve in London and Dr. Dmitri Donskoy in Moscow, whose findings we use in this analysis. "It seems smooth and resilient like that of a big quadrupedal animal" (Bayanov and Bourtsev in Hunter and Dahinden 1973:174). "The stride is actually much smoother than a normal man's, because the knee is bent as the weight comes on it. A walking man bobs up and down as his body goes over the top of his straightened leg. The Sasquatch in the film moves in a flowing fashion, with her leg being bent at all times" (Green 1968:55).

The cadence of the walk is unhurried: according to calculations, the creature made 1.5 sps (as against Patterson's 2.3 sps) strolling at a human speed of 6.6 km per hour. As for the smoothness and fluidity of movements, Dr. Donskoy provides the following elaboration and adds new observations:

> In the swinging of the leg, considerable flexion is observed in the joints, with different parts of the limb lagging behind each other: the foot's movement is behind the shank' which is behind the hip's. This kind of movement is peculiar to massive limbs with well relaxed muscles. In that case the movements of the limbs look fluid and easy, with no breaks or jerks in the extreme points of each cycle. . .The gait of the creature is confident, the strides are regular, no signs of loss of

> balance, of wavering or any redundant movements are visible. . .The movements are harmonious and repeated uniformly from step to step, which is provided by synergy (combined operation of a whole group of muscles)" (Hunter and Dahinden 1973:190, 191).

Now for some particulars in the movement of the limbs and body.

Foot angulation. William Roe said of his Sasquatch that "when it walked it placed the heel of its foot down first. . ." (Green 168:11). The filmed creature does the same. But the striking and unreported feature is not the way the heel is placed on the ground, but the manner in which it is raised off the ground. We wrote of "the apparent necessity for Sasquatch to raise his heels unusually high when taking long strides on bent knees" (Bayanov, Bourtsev and Dahinden 1983: in this volume). The filmed subject demonstrates this point in a marvelously clear-cut fashion (frames 265, 301, 311). The necessity of highly raising the heels in Sasquatch locomotion was one of the causes of the double-ball phenomenon. The evidence of the film gives graphic confirmation to this idea, leaving no doubt in the analyst's mind that the foot has an unusually high degree of flexion in the metatarsophalangeal joints which causes much stretching in the tissues of the ball (frames 265, 311, 312).

Lastly, a reference to paleoanthropology. "A relatively long trochlea tali in the Kiik-Koba specimen indicates an increased range of forward-backward movements of the foot in the ankle joint in comparison to modern man" (Bonch-Osmolovsky 1954:171). This tallies very well with the angulation of the filmed creature's foot.

Knee bending. "After each heel strike the creature's leg bends, taking on the full weight of the body, and smooths over the impact of the step acting as a shock-absorber" (Donskoy as quoted in Hunter and Dahinden 1973:190). As we have pointed out, the shock-absorbing function of knee bending correlates with a flattened arch of the foot. "In normal human walk such considerable knee flexion as exhibited by the film creature is not observed and is practiced only in cross-country skiing. This characteristic makes one think that the creature is very heavy and its toe-off is powerful, which contributes to rapid progression" (Ibid).

Grieve wrote of "the 30° of knee flexion following heel strike" and "The considerable (46°) knee flexion following toe-off" (Napier 1973:218, 219).

Eyewitness evidence: "Its knees were always bent as it walked. . ." (Green 1973:55), sighting of a creature, eight to nine feet tall, by Dick Brown, a high school music teacher near The Dalles, Oregon, 1971.

Evidence of paleoanthropology: "The structure of the long bones of the Neanderthaler's lower extremities shows that the knee joints were not fully straightened" (Nesturkh 1959:249-250). This means, of course, that other bipedal primates, preceding Neanderthals, also had their knee joints not fully straightened.

Thus all our sources of information indicate directly or indirectly a high degree of knee flexion in bipedal primates other than *Homo sapiens*. But what all these sources, *except the film*, are silent about is the implication of this peculiarity for outward morphology of such knee flexing bipeds.

As is widely known, stepping out on bent knees is one of the hardest physical exercises. And this is for *Homo sapiens* with his, on the average, moderate weight in comparison with the average for Sasquatches. If moving about in this manner is not part of a session in callisthenics, but daily routine for a creature as heavy as Sasquatch, the strain on its thigh muscles defies the imagination. Nobody had ever thought of that prior to the Patterson-Gimlin film. But Nature had to take care of that, if her creatures, the way she designed them, were to walk about. Hence the unheard of prominence of the thigh muscle—m. rectus femoris—whose presence in the filmed subject is revealed by the enigmatic bulge on the thigh, appearing and disappearing in rhythm with the steps. Thus, offering the answer ahead of the question, the film made the investigator think of and see the power source of the creature's walking on bent knees.

On the whole, we can't but agree with Dr. Donskoy's pronouncement:

> As a result of repeated viewings of the walk of the two-footed creature in the Patterson film and detailed examination of the successive stills from it, one is left with the impression of a fully spontaneous and highly efficient pattern of locomotion shown therein, with all the particular movements combined in an integral whole which presents a smoothly operating and coherent system" (Hunter and Dahinden 1973:189).

Finally, we would like to single out and stress the following points made in this section:

1. Both the integral whole and the particulars of the creature's movements are unmistakably different from those of a human being.
2. They are in accord with the creature's anatomy.
3. They indicate a very massive and heavy body.
4. They agree with the sighting and footprint evidence and the data of paleoanthropology.
5. They reveal facts quite novel to science.

Assessment of the Film and its Subject

Distinctiveness: There are two alternative opinions on the subject of the Patterson-Gimlin film. One is that it is a real female Sasquatch, the other—a man in disguise. Nobody assumes it is a robot, or a bear, or an ape, or a man going about his business in his Sunday best. Thus all agree that within these two possibilities the subject is quite distinctive.

Consistency: The consistency of the first version has been amply demonstrated in the course of this analysis. It has been shown that on the whole and in details the filmed specimen fits as well as can reasonably be expected the data of the other kinds of evidence. Besides, it is intrinsically consistent, that is to say all parts of its body are in cohesion with one another, and the movements are in harmony with the physique.

Not so with the second version, whose proponents have never bothered to explain how a man in a monkey-suit could have staged such a convincing performance despite the problems of size, weight, outward appearance and unusual movement.

Naturalness: A person, unacquainted with elephants, can have difficulty making head or tail of the creature, because of its trunk, and find the thing alarmingly unnatural. The same goes for a person looking for the first time at a female Sasquatch with her hair-covered breasts on a muscular body which moves in a manly gait.

As for the advocates of the second version, there is nothing easier for them than to utter "a man in a monkey-suit," but they are sure to get into trouble if they ever try to flesh up this utterance. To do so, it is not enough to understand about man and monkeys, as physical anthropologists and primatologists do. It is also necessary to understand about suits, or clothes in general, on

the one hand, and their relationship with a person's body and movements, on the other.

One person who is qualified to judge in this matter is a distinguished Moscow sculptor, Nikita Lavinsky, to whom we applied for advice on this problem. One aspect of Lavinsky's job in the course of a 40-year-old professional career has been modeling posthumous sculptures of outstanding personalities (who died in the revolution or war) using photographs of them for the purpose. To be successful in this endeavor, Lavinsky has to be an expert not only in human anatomy, as all sculptors must be, and the way a person's figure is revealed or concealed by clothes, but he is also a first-class expert in interpreting photographs of dressed-up people in terms of anatomy, angulation and movement.

Having viewed the Patterson-Gimlin film and studied its frames, sculptor Lavinsky stated in no uncertain terms the authenticity of its subject. His argument goes as follows: the creature is different from a man both in its anatomy and movements, yet its anatomy looks true to life and the movements spontaneous. What is more, the movements follow from and are in perfect harmony with the anatomy. These conditions cannot be met simultaneously by a man in any costume. The better a costume from the anatomical point of view, the worse it would be from the viewpoint of biomechanics. A clever costume on a moving hoaxer would *expose, not conceal* a fraud. "All talk of a man in a monkey-suit can only come from laymen who know nothing about the relationship between figure, movement, and costume," said sculptor Lavinsky to us.

Quite independently, a similar point was made by Dr. Don Grieve: "A man could have sufficient height and suitable proportions to mimic the longitudinal dimensions of the Sasquatch. The shoulder breadth however would be difficult to achieve without giving an unnatural appearance to the arm swing and shoulder contours" (Napier 1973:220).

The film was shown at the Moscow Research Institute of Orthopaedics and Artificial Limb Construction who specialists were unanimous in finding the movements of the filmed specimen natural and spontaneous and at the same time not identical with those of modern man.

Dr. Donskoy's conclusion is to the same effect:

> On the whole the most important thing is the consistence of all the above-mentioned characteristics. They not only simply occur, but interact in many ways.

> And all these factors taken together allow us to evaluate the walk of the creature as a natural movement, without any signs of artfulness which would appear in intentional imitations. At the same time, with all the diversity of human gaits, such a walk as demonstrated by the creature in the film is absolutely non-typical of man (Hunter and Dahinden 1973:192).

And again Dr. Grieve: "The possibility of fakery is ruled out if the speed of the film was 16 or 18 fps. In these conditions a normal human being could not duplicate the observed pattern, which would suggest that the Sasquatch must possess a very different locomotor system to that of man" (Napier 1973:220). Since we have established the speed of the film to be 16 fps., Dr. Grieve's conclusion can be stripped of its "if" modality and put to its rightful place in this research.

* * *

We have subjected the film to a systematic and many-sided analysis both in its technical and biological aspects. We have matched the evidence of the film against the other categories of evidence and tested its subject with our criteria of distinctiveness, consistency, and naturalness. The film has passed all our tests and scrutinies. This gives us ground to ask: who other than God or natural selection is sufficiently conversant with anatomy and biomechanics to "design" a body which is so perfectly harmonious in terms of structure and function?

Further research may correct some of our findings, but it seems most improbable that the positive result can be voided. Hence we confidently give this verdict: *The Patterson-Gimlin movie is an authentic documentary of a genuine female hominoid, popularly known as Sasquatch or Bigfoot, filmed in the Bluff Creek area of Northern California not later than October 1967, when it was viewed by René Dahinden and other investigators.*

Until October 1967 we had lots of information on relic hominoids but they remained inaccessible to the investigators' sense of vision. We were dealing then with the underwater part of the "iceberg," as it were. October 1967 was the time when the fog cleared and the tip of the iceberg came into view. True, we still can't touch or smell this "tip," and have to be content with viewing it in the film and photographs obtained from the film. But

in this we are not much different from the physician who studies a patient's bones without ever meeting that particular patient—just looking at the x-rays. Or from the geologist, who studies the geology of Mars by looking at the close-ups of its surface.

The difference is, of course, that in the geologist's case seeing is believing and, besides, he has all the might of modern science at his disposal. Those close-ups cost a couple of billion dollars and nobody dares to treat them frivolously. The Sasquatch investigator, on the other hand, offered his photographic evidence to be studied by science for free and the evidence was not taken seriously. According to Dr. Richard W. Thorington, Jr., of the Smithsonian, ". . .one should demand a clear demonstration that there is such a thing as a Bigfoot before spending any time on the subject" (Hunter and Dahinden 1973:124). If by a clear demonstration Dr. Thorington means a live Bigfoot be brought to his office, then it would be more of a sight for the layman than for the discriminating and analytical mind of a scientist.

Conclusion

The relic hominoid research is of special, potentially unlimited value for science and mankind. Thanks to the progress of this research, we know today that man-like bipedal primates, thought long extinct, are still walking the earth in the second half of the 20th century. We can also see how such a biped looks and how it walks.

We are indebted for this breakthrough to the late Roger Patterson who filmed a relic hominoid in Northern California in 1967, but who, to our sorrow, was not destined to witness the full triumph of his achievement.

The marriage of Russian theory and American practice in hominology proved to be happy and fertile. By joining forces we have established not only the authenticity of the film but also that the Sasquatch is part of the natural environment of North America, and its most precious part at that. May we offer this conclusion as our modest contribution to the cause of growing friendship and cooperation between the peoples of the Soviet Union and North America. The search for humanity's living roots is a cause for all mankind and this makes us look forward to new international efforts in this intriguing investigation.

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