

# KOKO

From a true 'animal house' at Stanford comes the world's first 'talking' gorilla

BY JOEL GREENBERG

At first glance, the 10x15-foot trailer that sits on the Stanford University campus seems like hundreds of thousands of others. It has a kitchen, a living room, a hallway leading to a small bedroom, a bathroom and a master bedroom. Familiar household items such as toys, pots and pans, chairs and mirrors stock the mobile home. On closer examination, however, one notices that the living room windows and sliding glass doors are protected by chain link panels — from the inside. And the living room houses a metal sleeping box, an exercise bar and a trapeze.

No, it's not John Belushi's West Coast home. But it is the living quarters of Koko, the world's first known talking gorilla, and her younger housemate (and, it is hoped, future husband), Michael. Koko, a 7-year-old, 140-pound lowland gorilla, has a working vocabulary of 375 hand signals and also understands verbal commands from humans. Michael, who joined her in 1976, has worked his way up to 45 signs.

Ever since the now-pregnant Washoe became the first chimpanzee to learn human sign language (SN: 7/29/78, p. 72), chimps have made notable advances in communication. Most recently, the first instance of "symbolic communication between nonhuman primates" was reported at the Yerkes Regional Primate Center and Georgia State University (SN: 8/19/78, p. 117). And in 1977, experimental results indicated that chimps possess a sense of self (SN: 5/28/77, p. 340).

Until now, however, gorillas have been comparatively ignored in the primate-communication research field. Some, like Koko's friend and trainer Francine "Penny" Patterson, view the omission as an insult. "Previous reports had indicated that gorillas were 'dumb' and 'stupid,' and not as smart as chimps," Patterson says. "I was not convinced."

Now—some six years after she adopted the then-sickly infant gorilla from the San Francisco Zoo—Patterson is not shy to note that Koko has mastered 20 percent more signs than the famous Washoe, and does so with a considerable amount of primate flair. "Koko," says Patterson, "is my closest friend ... no, more like my child."

This "child's" IQ, as measured by the Stanford-Binet test, is 85 to 95; she scores



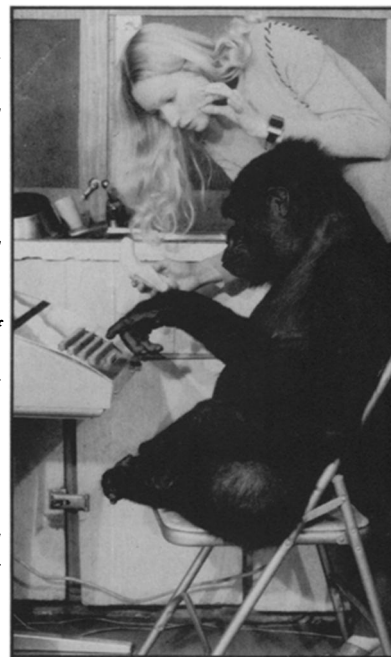
Photos: National Geographic Society

Michael (left) and Koko place their lunch orders with Patterson during a picnic.



Koko does not appreciate taking the brunt of the blame after she and Michael collaborated to rip the legs off a Raggedy Ann doll. She responds to Patterson's reprimands with the worst insult in her repertoire (top to bottom): "You" (pointing her finger at Patterson) "Bad" (hand moving down face) "Toilet" (clenched fist over nose).

With her recently acquired auditory keyboard linked to a computer, Koko can now produce spoken words as well as signs. Along with numbers and letters of the alphabet, the 46 keys also bear simple geometric patterns representing words for objects, feelings and actions, along with pronouns, prepositions and modifiers.



equally well whether the test is administered in sign or verbally. What impresses Patterson, a Stanford doctoral candidate, more than just the size of Koko's vocabulary is the rather human way she uses it. "She's very much like the pre-school child in a creative language period," she says.

Among Koko's unmistakably human attributes are a tendency to lie, accept bribes, improvise and rhyme words (a highly complex task, since it involves transforming signs to sounds). For instance, she has recently taken to responding to words such as "blue" by signing "do"; and to "squash" with "wash." Her latest masterpiece, however, came after being presented a broccoli stalk, to which she said: "Flower pink, fruit stink. Fruit pink stink." Koko also replaces conventional words with her own interpretations: A mask is "eye slot," a Pinocchio doll is an "elephant baby" and a game of hide and seek is "quiet chase." And when two researchers were arguing over whether she was an adolescent or a juvenile, Koko broke in to inform them she is a "gorilla."

But like a human child, Koko can be

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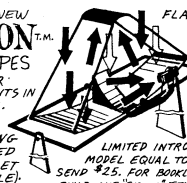
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## ... Koko

bratty and deceiving. After Michael joined her, she found him a convenient scapegoat for much of anything that went wrong. "Who broke the toilet?" Patterson asked her after Koko had emerged from a noisy bathroom session. "Michael toilet," the gorilla replied without blinking. When in a spiteful mood, Koko is fond of addressing Patterson and her colleagues as "dirty toilet," "nut" or "bird." Such outbursts, along with the destruction of property, may earn her a trip to a corner of the trailer where she sits and faces the wall, until she apologizes and asks for a hug.

Even such episodes, however, are based on a deep friendship between Koko and the 31-year-old Patterson. "Her favorite activity is asking me to take off my shoes and tickling my feet," Patterson explains. During this activity, the two jostle and giggle like teenagers at a slumber party. "Gorillas are tragically misunderstood animals," she says. "In fact exceedingly shy, placid and unaggressive, they are conceived to be ferocious, slaving man-killers."

Tickling aside, Patterson says she and her colleagues are "only beginning to scratch the surface of the linguistic and intelligence capabilities of the animals." Koko and Michael are beginning to communicate with each other via sign language. Koko has begun to work with a keyboard computer that vocalizes a word

after she has punched it; but since there is only one computer, the gorillas must wait until a second one is available to attempt computerized communication, such as that performed by the Yerkes chimps. And, Patterson says, Koko first demonstrated self-awareness at age 4 by responding to her own image in a mirror.

Koko is also learning the advantages of working for a price, rather than for free. She will intentionally give the wrong answer to a question or appear stymied during a lesson — until she is offered a food reward. Suddenly the correct answer comes to her. This response, along with lying to avoid punishment, is not a mimicry of humans, Patterson says. "She didn't learn it from us," she says. "It's the natural outcome of the workings of a mind that can predict what will happen in the future."

In addition, Koko has branched out into other areas, such as photography. She snapped the cover picture for Patterson's article in the October NATIONAL GEOGRAPHIC magazine — a self-portrait for which she was paid the standard \$750 cover picture fee. "We don't know whether or not this was a flash in the pan," says one GEOGRAPHIC official. "But she certainly seems to show promise as a photographer." Apparently, Koko is also considering a teaching career. She has attempted to teach sign-words to her dolls and to her

trainers, as well. "She's taken our hands and molded them into signs," Patterson says.

Perhaps the only communicative skill for which she has no talent is talking — but she tries. "She can make an 'h' sound," Patterson says. "She has tried to speak, but just can't do it. The vocal tract has a very different structure from that of a human. All she can do is grunt or give a high-pitched squeak."

Koko has also tried without success to seduce Michael, but the handlers hope and expect that will happen when the male gorilla is more mature. Patterson would like to study Koko, Michael and their offspring "throughout their lifetime and mine. I want to chart the differences and similarities" between the gorillas and humans, she says. Most important, she wants to see if the couple can and will teach their child sign language on their own.

Patterson also wants to study the intelligence of other species, such as dolphins or elephants. "Even a common cat or dog has more going for him than we believe," she says. □