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The Corrected Lengths of Two Well-known Giant Pythons and the Establishment of a New Maximum Length Record for Burmese Pythons, *Python bivittatus*

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There is strong popular interest in the sizes of giant pythons that dates far back into history and continues to the present day. This was particularly well illustrated by the media hysteria that followed the USGS news release on 20 February 2008 that was titled "USGS Maps Show Potential Non-Native Python Habitat Along Three U.S. Coasts." The report that followed described the Burmese python as "huge" with a maximum size of 7–8 m (23 ft–26 ft 3 in) (Rodda et al., 2008/2009; Reed and Rodda, 2009). The countless newspaper articles, news reports and documentaries that followed typically stressed the "massive" size of Burmese pythons and of pythons in general.

We have seen a lot of Burmese pythons in captivity over the past 40 years, and none approached those lengths. We believe that a realistic size limit for this species has taken on greater importance since Burmese pythons are no longer considered to be a subspecies of the Indian python, *Python molurus*, and are now recognized as a species, *Python bivittatus* (Jacobs et al., 2009; Schleip and O'Shea, 2010). Prior to this taxonomic change, many of the historical records of the largest specimens of Indian pythons and Burmese pythons have been confused.

In the course of our research, we found numerous examples of the difficulties in making correct measurements of living pythons. There are significant discrepancies that have arisen when the measurements of living pythons are later compared to the measurements of those same pythons at death. The length of a living large python, estimated or measured, is significantly greater than the measurement made at death in every case we found. Indeed, in our experiences, we all have witnessed examples of this phenomenon.

We are not aware of any mention in herpetological literature that at any point in life does the length of a snake decrease. Snakes grow relatively rapidly at a young age, and then the rates of growth slow, but at no time do they reverse. We here state that we do not believe that there is a significant difference in the live length of a snake soon before death and the length then measured after death. However, so far as we are able to learn, this has never been investigated; we acknowledge that there is some small possibility that snakes actually shrink after death, but this is not our experience or observation and we cannot offer any explanation for what that process might be.

We here publish previously unreleased data regarding the accepted record maximum size of the Burmese python, *Python bivittatus*, held by a female Burmese python known as "Baby." This snake was on public display during the period 1994–2003 at Serpent Safari, a permanent herpetological exhibition located in Gurnee, Illinois. One of the authors [LD] was the owner of this snake and another [SLB] is the veterinarian who cared for Baby.

In the course of our investigations, we have even come to question the actual length of what is widely accepted as the largest snake ever maintained in captivity, that being "Colossus," a reticulated python, *Broghammerus reticulatus*, that resided in the Pittsburgh Zoo from 1949 until 1963. The history of Colossus is perhaps the best example of the discrepancy between purported size and actual measured size.

Colossus

The reticulated python known as Colossus arrived at the Highland Park Zoo [now known as the Pittsburgh Zoo & PPG Aquarium] in August 1949 and remained there on exhibit until death in April 1963. By most accounts, Colossus was received from an animal dealer in Singapore, although Pope (1961) reported the origin of Colossus as "Siam" [now Thailand]. Colossus arrived at the zoo identified as a wild-caught adult female that was 6.71 m (22 feet) in length. In fact, Colossus was a male, and was several feet shy of that length.

We received this memory of Colossus from Arthur Bianculli. Bianculli was first a volunteer and then curatorial assistant at the Carnegie Museum from 1955 to 1979. He wrote, "I did see Colossus many times when he was alive. When I was a boy during the 1950s, I would walk over 4 miles to the Highland Park Zoo a few times every year. Colossus was usually lying near the front of his enclosure, often right up against the glass."

Bianculli continued, "Colossus wasn't obese, but he wasn't skinny either. He was healthy looking, well-muscled, with beautiful colors, an intricate pattern, and a radiant iridescence. In another nearby enclosure there was kept an anaconda which was shorter than Colossus, but was noticeably thicker. So, I would say that Colossus was about the proper weight for a python, possibly only slightly heavier than a wild specimen. Unfortunately, I don't know if Colossus was friendly or not because I never saw him interact with the keepers, nor did I ever see him feeding. I don't remember ever hearing any anecdotes about his being aggressive. To be perfectly honest, I can't remember ever seeing Colossus move. I don't know if he was lethargic by nature, or if he was always busy digesting, but every time I saw him he stayed perfectly still. My friends and I would stop and stare at him for perhaps 15 minutes, hoping to see him move, and sometimes wondering if he was alive. I think the only movement we ever saw might have been a flick of the forked tongue. I don't think Colossus was famous or even well-known at that time. I think that came later, thanks to the Guinness Book of Records. I mean everyone realized that he was big, but no one imagined that he might be the biggest."

We don't completely agree with Bianculli's assessment of the possible obesity of Colossus. There are two pictures of

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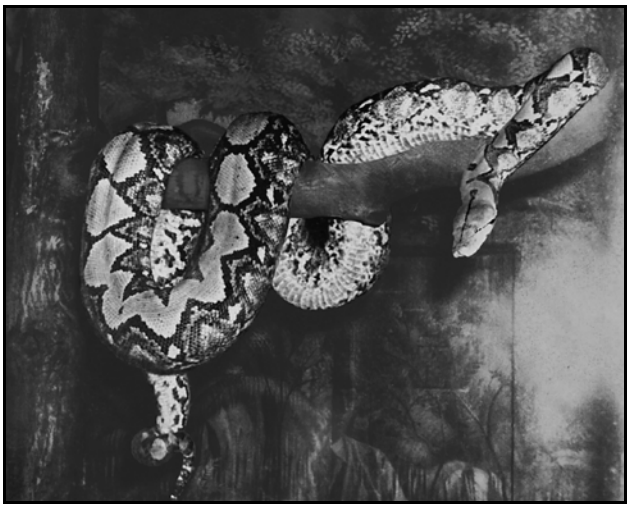
Colossus published opposite page 45 in Pope (1961). The lower image, reprinted below, shows a large, apparently fit, reticulated python, heavy, but not ridiculously so. However, the upper image of a coiled Colossus is the picture of an immensely obese reticulated python. Not a scale touches another on the posterior body. It's highly likely that this picture shows Colossus digesting one of his many 30-pound meals of pig, but the distension of the scales on the posterior body is typical of a very fat python with a massive amount visceral fat; such distension is not seen on a more slender python regardless of a meal. According to Barton and Allen (1961), Colossus consumed 68 pigs totaling 1991 pounds of food in his first 11 years of captivity. No doubt, Colossus did grow to gigantic size on this diet.

Herb Ellerbrock is a keeper in the Reptile Department of the Pittsburgh Zoo—and a living longevity record in the Reptile Department. He began his employment there shortly after the death of Colossus and 48 years later is still there. Ellerbrock (pers. com.) also grew up in the area of the zoo, visited the Reptile House whenever possible, saw Colossus many times, and knew many of the keepers who cared for this giant snake. Ellerbrock reports to us that Colossus was not tame, not trustworthy, and was never directly handled by keepers.

In a report on the feeding and growth of captive boas and pythons, Barton and Allen (1961) identify Colossus as "the male reticulated python received at the Pittsburgh Zoo" and as "the most spectacular snake now on display in the United States." Allen was then the supervisor in the Reptile Department of the Pittsburgh Zoo, and directly involved in the care and maintenance of Colossus. Barton and Allen (1961) state that the most accurate measurement of the weight of Colossus was made in 1954 when he was found to weigh 133.7 kg (295 pounds). The means by which this measurement was made is not described.

An account featuring Colossus and titled "The Largest Snake Ever Held in a Zoo" was published by Guinness World Records Limited (Wood, 1972). It states that on 12 June 1957 Colossus weighed 145.1 kg (320 pounds), and cites Barton and Allen (1961) as the source of this information; we note that this datum is nowhere mentioned in that account. However, Pope (1961) also mentions that Colossus weighed 320 pounds in 1957.



Colossus in his exhibit at the Pittsburgh Zoo. Photograph ca. 1960 by Bill Allen, Curator of Herpetology, courtesy of Herb Ellerbrock, Reptile Department, Pittsburgh Zoo and PPG Aquarium.

In the Barton and Allen paper, Allen states that Colossus was measured at 7.1 m (23 ft 3 in) on 4 June 1951; at 8.3 m (27 ft 2 in) on 24 February 1954; and at 8.7 m (28 ft 6 in) on 15 November 1956. Allen describes the means used to obtain the measurements as holding a measuring tape over the giant snake's body through a small gap between the transfer cage and the exhibit, and measuring section by section as the snake entered its cage. Barton and Allen (1961) state "We cannot offer these length data as exact measurements, because of the way in which they had to be collected, but we are certain they are accurate to within a few inches." The last several years of Colossus's life, there was general certainty that he was at least 30 feet in length.

Colossus died at the zoo on 14 April 1963. The next day several small Midwest newspapers each ran a similar small article, likely a press release issued from the Pittsburgh Zoo. The following article, published in the *Indiana Evening Gazette* from Indiana, Pennsylvania, is an example:

Advanced Age, Pneumonia Kill Pgh. Zoo Python

PITTSBURGH (AP)—Advanced age and pneumonia have taken the life of a snake believed to be one of the longest in captivity.

Colossus, 28½ feet long and weighing 300 pounds, died Sunday at the Highland Park Zoo. A Reticulated Python, he was thought to be about 30 years old.

Colossus was placed on display at the zoo in 1949 when he was 22 feet long. He was brought here from Malaya via Singapore.

However, the story was not correct. In the Guinness account about Colossus, Wood (1972) published several quotes from a letter he received from Bill Allen, dated 23 April 1966, regarding the death of Colossus. Allen writes that Colossus was not weighed that day but stated "[the body of Colossus] weighed over 200 pounds, as it took several men all they could do to move it, by dragging and pulling." More significantly, Allen reported that Colossus measured 24 feet. Allen explained this rather significant decrease in length writing "[the body of Colossus] was stiffened up and vertebrae had pulled together shrinking the snake." Wood (1972) stated that an autopsy of Colossus revealed that some vertebrae and "several rib sections" were nearly eaten through by reptilian tuberculosis.

According to Bianculli, the body of Colossus was delivered intact to the Carnegie Museum. There, on the morning of 15 April 1963, the carcass was skinned by Neil D. Richmond, then the Curator of Herpetology at the Carnegie Museum. The snake confirmed to be male and measurements were taken of the skin and the body. Today the skull and an assortment of vertebrae and ribs from Colossus are deposited in the collection of the Carnegie.

One of the authors [JPE] placed a request to Stephen P. Rogers, current Collections Manager of the Carnegie Museum, to receive the catalog information on Colossus held by the Museum. Rogers very graciously responded and sent this information: "We do not have the entire skeleton of Colossus, only a skull and selected vertebrae and ribs. Any disease that was present was probably not preserved in the bones saved. The data from the Catalogue is as this: CM 38716 PYTHON RETICULATUS MALAYSIA: SPECIFIC LOCALITY UNKNOWN, MALE, COLLECTOR UNKNOWN, PARTIAL SKELETON - SKULL, SOME VERTEBRAE & RIBS. "NAMED COLOSSUS. PITTSBURGH ZOO, DIED 14 APR, 1963. LOCALITY GIVEN AS MALAYA. FRESH HIDE 23' 11", SKELETON 20' 10", HEAD WIDTH 3.75", HEAD LENGTH 6.75", TAIL 27.5". SEE: BARTON, A J AND W.B. ALLEN 1961 ZOOLOGICA 46:2 P 83-87. I am not sure where the 28 feet length came from as the skeleton proper was only 20 feet 10 inches according to the original data."

An excellent illustration of the difficulty of accurately estimating the length of a living large python comes from Merel J. Cox (1991). Cox is a herpetologist who has traveled and lived in Southeast Asia, and has seen many reticulated pythons in his life. Cox wrote in *The Snakes of Thailand and Their Husbandry* that he personally had seen a reticulated python " . . . at a length of a few centimeters less than ten meters." In the preparation of *Tales of Giant Snakes* (Murphy and Henderson, 1997), author John Murphy contacted Cox, asking where he had seen this tremendous specimen. Cox answered, ". . . it was at the Pittsburgh Zoo, and the snake was named Colossus."

Colossus truly was an immense, big-bodied, giant snake, but he was 6.35 m (20 ft 10 in) in total length, exceptionally long for a male python, but nowhere near as long as was generally reported. It seems likely that Colossus did visibly grow larger in front of his keepers during his 14-year span in the Pittsburgh Zoo, but he was growing heavier, not longer. Colossus was neither the longest nor the heaviest snake ever maintained in captivity.

Baby

In a recent book on Burmese pythons, Dorcas and Willson (2011) state on page 28 that the length of Burmese pythons ". . . may approach 25 feet (7.62 m) in extremely rare circumstances" and then on page 129 they list the record maximum size for a Burmese python as 8.23 m (27 feet). The source of these data is not cited, but it is likely *Guinness World Records*—one of the editions published from 2003 to 2006, which refer to an individual snake named Baby.

So far as we have found, most, possibly all, reports published in the past 18 years that mention Burmese pythons with lengths of 6.1 m (20 ft) or longer refer directly or indirectly to Baby. Baby was a gigantic female Burmese python owned by one of the authors [LD].

Baby died of complications from a metastatic renal tumor. She was just shy of 27 years of age. She was old for a Burmese python; the published longevity for Burmese pythons, set by a python at the San Diego Zoo, had a known age of 28 years, 3 months, 9 days (Slavens and Slavens, 2000).

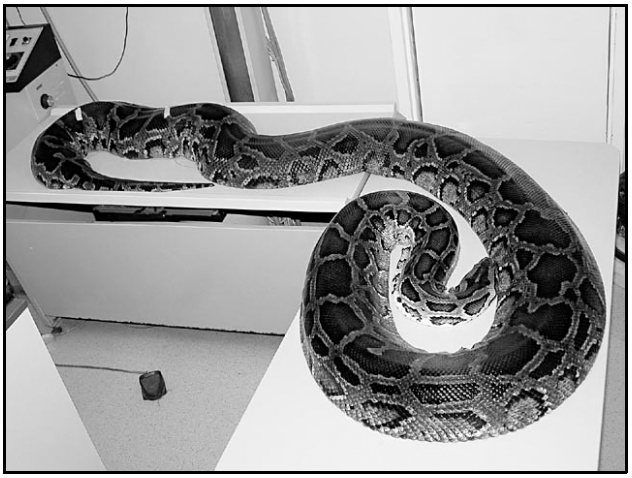
Baby first came to public attention in 1994 in an article published in the third issue of the new color, glossy herp magazine, *Reptiles* (Didier, 1994). The article featured a picture of Lou Daddono with Baby, and the snake looked to be a genuinely large specimen. In the interview, Daddono states that Baby was "approximately 20 feet long." Baby was again featured in *Reptiles* six years later, then described as 7.62 m (25 ft) in length (Cooper, 2000).

According to information sent in 2009 to one of the authors [JPE] from Joan Singer, General Manager of Serpent Safari in Gurnee, Illinois, Baby was "certified" by the Guinness Book of World Records as the largest snake in captivity in 1998. A team from Guinness World Records Limited and Fox TV visited Serpent Safari and "officially" measured Baby. Her weight was measured to be 182.8 kg (403 pounds), the heaviest snake ever weighed at the time.

As is typical of Burmese pythons, Baby was a gentle snake that tolerated handling and she was measured while moving in her cage using a cloth measuring tape that was run down the center of her back; her length was thereby recorded to be 27 feet long. Baby was first listed in *The Guinness Book of World Records* in 1999, and continued to be listed as the heaviest snake ever reliably measured until the 2006 issue.

Due to her spreading cancer and failing health, Baby was euthanized in the veterinary office of one of the authors [SLB]. Shortly after death, she was stretched full length down a hall and measured with a steel tape. Her actual length was determined to be 5.74 m (18 ft 10 in).

Like Colossus, Baby was genuinely a gigantic snake. By all accounts, and evident in all photos, as she grew older she became obese. Those keepers who cared for her and the public who admired her all assumed that she was growing longer as she grew heavier, but that was not the case. The eye can deceive and, as we have pointed out, it is very difficult to determine the length of a living large snake. We are willing to accept that, at least on the day she was officially weighed, she tipped the scales at 403 pounds. But Baby was significantly shorter than the 27 feet with which she was credited.



Baby in the examining room of the veterinarian toward the end of her life. Her medical problems have caused her to lose more than 100 pounds of weight. Photograph by Stephen L. Barten, DVM.

Baby was unchallenged as the record longest Burmese python ever measured. With this realization of the dramatic reduction in her actual length, there comes the question of what, then, *is* the record maximum length of Burmese pythons?

First, however, we want to point out that we are not aware of any attempt by the various involved parties to purposely deceive in their overestimations of the lengths of either Colossus or Baby. Honest mistakes were made in the very difficult endeavor to measure a live giant snake. Colossus was a huge dangerous snake, very difficult to measure, while Baby was publicly measured by an objective third party. It may be that neither the Pittsburgh Zoo nor Serpent Safari corrected the overestimations when and if they became aware of them, but they can scarcely be faulted for not wanting to lessen the publicity and impact of their best known and most popular attractions.

The lesson to be learned from these two examples is that length records for large specimens of pythons, boas and anacondas must be based on measurements made of the intact body soon after death, using a steel tape and in the presence of witnesses. Alternatively, a giant snake that is heavily sedated or anesthetized enough to allow it to maintain a relaxed, straightened position also can be measured accurately. Those measurements must then be published.

The record maximum length for Burmese pythons, *P. bivittatus*

It is important to recognize a record maximum length for a species. That length is to be equal to the length of the longest known specimen that has been accurately and correctly measured. We point out that it is also important that the measurements of other large specimens be entered into the literature, so that a general picture of the maximum size of a given taxon is formed.

We stress that even in species with indeterminate growth patterns, as the growth of reptiles has been described, long life does not necessarily mean exceptionally large size. Only a very small percentage of Burmese pythons, given the necessary longevity and conditions, will achieve anywhere near the maximum record size for the species. Most large older adults will be significantly smaller than the maximum length.

The problem of a single giant individual such as Baby is that her widely accepted length was so much greater than that of any conspecific that no one bothered to record the lengths of other very large Burmese pythons. During the past 30 years, there have been more than 100,000 Burmese pythons in captivity in the United States and there have been many older large females that should have been measured and their lengths recorded, but were not because they were thought to be so much smaller than the purported length of Baby.

The story of the record maximum size of boa constrictors makes a strong parallel to this situation in Burmese pythons, and illustrates the importance of identifying other large specimens. Oliver (1958) reported that in during WWII, a crew working on malaria control in the jungle of Trinidad killed a huge boa constrictor, *Boa constrictor*; this boa was reported to be 18 feet 6 inches in length. This snake was so much larger than any other boa constrictor that the measurements of only very few other large specimens have since been entered into the literature. This Trinidad record was accepted and published in many other manuscripts, including the widely read books of Pope (1961), Minton and Minton (1973), and Mehrtens (1987). However, Boos (1992) decided to investigate the record; he was able to locate and contact two members of the crew some 50 years after their work in Trinidad, and learned that this giant snake was actually an anaconda, *Eunectes murinus*, and not a boa constrictor. Because of this mistaken identity, today there still is no well accepted record maximum length for boa constrictors even though boas are common in many areas of their natural distribution and they are one of the most common snakes in captivity.

Designating a record maximum length for Burmese pythons takes on additional importance for two reasons. One is that this taxon is recently reclassified as a species and morphological data specific to Burmese pythons is important. A second is that exaggerated claims of the potential giant size of Burmese pythons are being made by the invasive python camp in south Florida, feeding incorrect information to the media.

We looked through historical accounts and entries for Burmese pythons for published records of the largest specimens. While nearly every account lists a maximum size for the species, most are anecdotal, stating lengths that are not actually based on specimens. For example, Deuve (1970) states that the maximum size of Burmese pythons is 7.62 m (25 ft) but does not explain on what this length is based or from where it came. He then states that the largest specimen known from Laos measured 4.50 m (14 ft 8 in) and was captured in 1957 in the town of Savannakhet—this is the kind of record that we looked for. Schleich and Kästle (2002) state that the maximum length is 7.62 m specimen based on a specimen from Laos and cite Deuve (1970) as the source, but that is not what Deuve stated. Both Whitaker and Captain (2004) and Saint Girons (1972) list 6.0 m as the maximum size without any explanation. Shah and Tiwari (2004) list the maximum size as 6.5 m (21 ft 4 in) without identifying any source for this measure; they do state that a 6.25 m shed skin was found in Royal Bardiya Park, but shed skins stretch significantly and in our opinion, the shed skin could have come from a python only 4 m in length. Boulenger (1912) states "Grows to 30 feet" without explaining on what this is based and apparently ignorant of the fact that neither Indian pythons nor Burmese pythons are found on the Malayan Peninsula. Rooij (1917) goes a degree higher and states that the species "reaches 10 meters," but likewise, she does not refer to any specific specimen and apparently is only repeating hearsay.

Wall (1921) lists measurements of several large pythons. Wall did not recognize Burmese pythons as a valid taxon, so data from Indian pythons and Burmese pythons are confused. He lists a specimen mentioned in a periodical, *Land and Water*, (August 10, 1866 or 1867) with a length of 18 ft 9 inches from Musoorie in Uttarakhand Province, India. That would be west of the western end of Nepal, and a python from that locality would probably be identified today as a *Python bivittatus*; however, if found a short distance south of Musoorie, there would be a strong chance that this would be a *Python molurus*.

The largest Burmese python record we can find is a snake that was shot by the Maharajah of Cooch Behar, taken in the district of Cooch Behar in Assam in the late 19th century, cited

by Anonymous (1901), Wall (1921), Daniels (1983), and Murphy and Henderson (1997). This snake was taken as a trophy and is purported to have measured 5.84 m (19 ft 2 in). As reported by Anonymous (1901), this snake was originally identified as a reticulated python; it was killed, skinned, the skin sent to a London taxidermist, mounted as a full mount, and then returned to India where the Maharajah donated the mount to the Bombay Museum. Later, according to Wall (1921) the specimen was identified as *Python molurus* (*sensu lato*). Unfortunately, it is not clear if the reported length is based on the freshly killed snake, the skinned hide or the length of the mounted specimen. The specimen was taken more than 110 years ago and it is unlikely that the uncertainty about its measure can be resolved.

Thus, it is our opinion that the record maximum length for Burmese pythons, *Python bivittatus*, is 5.74 m (18 ft 10 in) and that record is based on the specimen identified as Baby. Even though she lost 29% of her purported 27 feet length, so far as we are able to find, she remains the longest Burmese python.

As we mentioned earlier, we suspect that many possible record-length snakes may not have been reported over the past 18 years because of the published exaggerated size of Baby. We expect that this new record maximum length may well be exceeded in the future. However, the candidate for the record will have to be correctly and accurately measured and the measurement published before it can be accepted as a record.

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