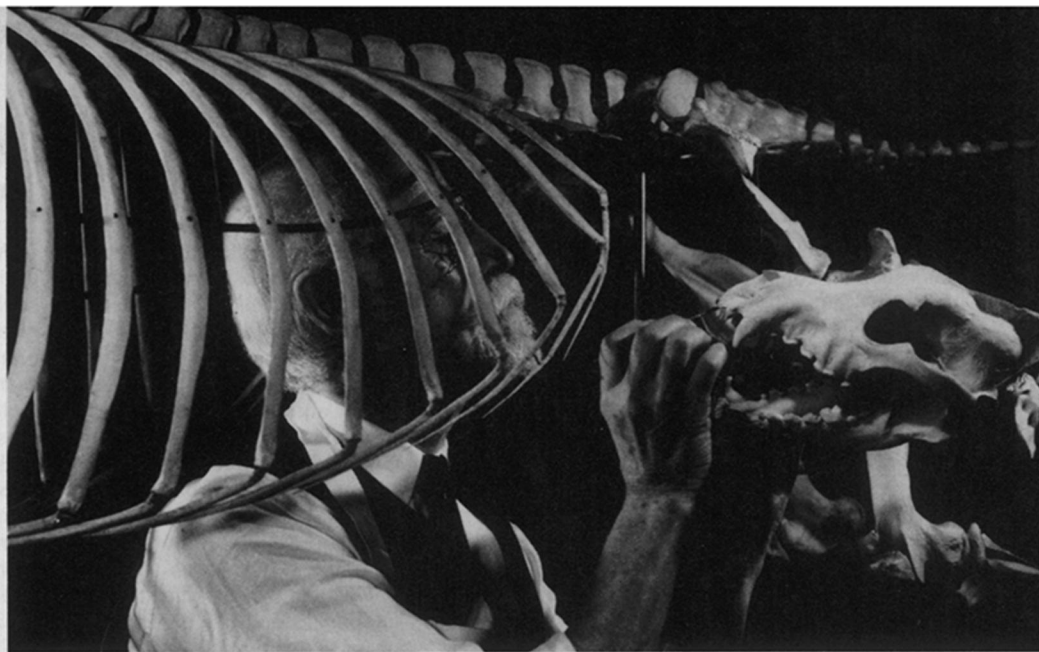


The skeleton of a rearing horse contrasts in structure and posture with that of a man reaching for the horse's bridle. This pair was one of Chubb's first large mounts.



A CELEBRATION

By JULIE ANN MILLER

Originally a machinist by trade but a naturalist by avocation, S. Harmsted Chubb early this century set himself the challenge of breathing life into bags of bones. At that time, exhibits of mounted skeletons were "of questionable interest even to specialists," he wrote, because there was no attention to detail, many bones were simply omitted and the skeleton was often arranged into a flat-footed position that would have been impossible during the animal's life. "It is small wonder," Chubb wrote in 1929, "that the department of skeletons [in museums] was considered a place to be shunned by those of refined taste."

Chubb wrote that his challenge was to place the bones in their natural positions, "and thus express beautiful movements, animation, and even mental emotions, so that not only the student and artist but the casual museum visitor would discover beauty in them."

His response to the challenge, a set of large skeletons he mounted during his more than 40 years at the American Museum of Natural History in New York City, is on display there in an exhibit that will continue through June 16. Although the skeletons dramatically influenced the tradition of bone mounting in museums, most have not been on public display for more than 20 years.

The skeletons in the new exhibit, which is entitled "Captured Motion," represent running wolves, dogs and horses, a donkey scratching its leg in a precarious posture, an opossum eating a chicken, and a man reaching up to grasp the bridle of a rearing horse. A silhouette of the man and horse skeletons has been the logo of the museum since 1974. The exhibit also includes

Chubb's mounted skeletons of two famous racehorses — Sysonby, who died in 1906, and Lee Axworthy, who in 1916 became the first trotting stallion to break the two-minute mile.

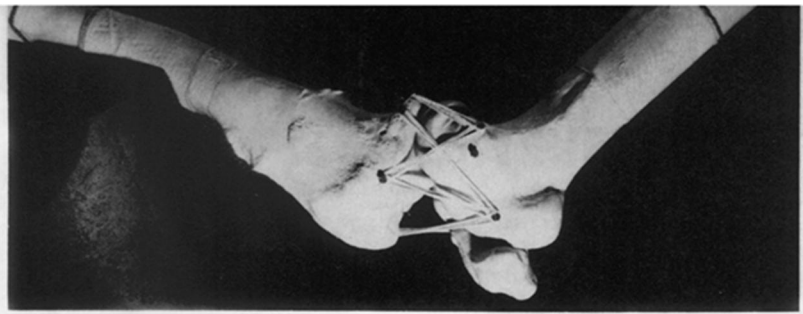
Chubb's interest in bones extended from his youth, when he would bring home the carcasses of small animals he had found, to his death in 1949. As a friend described it, "When you were talking to Chubb you always felt that he was thinking about the next bone on a horse."

While working as a machinist, he mounted small skeletons as a hobby. He often visited the American Museum of Natural History and was dismayed to see that most of the skeletons there were improperly mounted. He reported this to Henry Fairfield Osborn, then a curator (and later president) of the museum, and showed Osborn one of his own mounts of a cat skeleton. Osborn bought Chubb's cat skeleton for \$40, and ordered an opossum and a raccoon. Chubb did "free-lance osteology" for several years, then was given a position on the museum staff.

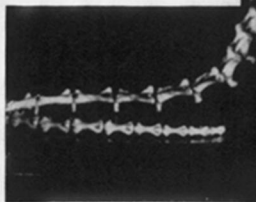
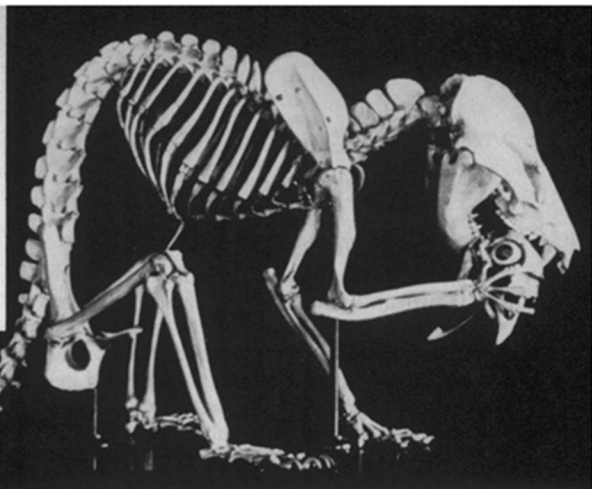
His preparation of skeletons was painstaking, each involving about 200 bones and taking more than a year. He devised his own mounting methods, bolts and stands. To determine the correct position of all the bones in a speeding animal, Chubb used the just-invented technique of stop-action photography. He studied his own photographs and those of Eadweard Muybridge, the Pacific Railroad photographer who had devised a method using a shutter speed of 1/2,000 second. At that time most photographers required that their subjects pose immobile for 12 full seconds. To obtain some of the photo-

'Every skeleton I ever mounted is doing something.'

—S.H. Chubb, 1948



Chubb devised his own methods of fastening bones in skeletal mounts (above). At left, he is shown putting the final touches on a wolf skeleton. At right, his mount of an opossum eating a chicken exemplifies the concept of "living" skeletons.



OF BONES

graphs of moving horses, Chubb devised a makeshift seat on which he could dangle from the museum roof while an assistant below drove a trotting horse marked with white spots on key anatomical points to reveal the curve of the spine and the shifting of muscles in action.

The lifelike skeletons have had scientific as well as aesthetic value. They established fine points of anatomy, especially in horses, and Chubb was consulted by authors of veterinary anatomy texts. In addition, his work contributed to the beginnings of the modern studies on animal locomotion.

Chubb described a 1929 exhibit of his "living" skeletons: "The object of this exhibit is not only to show the function and behavior of the bones during an intensely speedy action, but also to point out certain interesting rules and regulations which are strictly adhered to by nearly all terrestrial mammals."

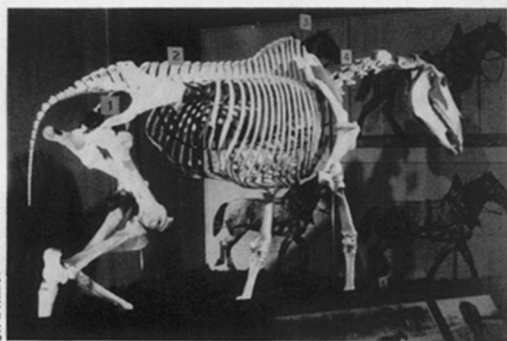
In a publication that same year, for example, he noted the differences in the sequences in which a horse and a dog move their feet as they run. A dog moves a back leg on the first side, then the back leg on the second side, then the front leg on the second side, then the front leg on the first side. This is called a rotary run. The galloping horse, in contrast, moves one back leg, the second back leg, then the

front leg on the first side before the front leg on the second side—a "diagonal" run. As Chubb illustrated in his skeletons of a Russian wolfhound and of the racehorse Sysonby, at the moment the limbs are drawn together under the body, the two that come most nearly in contact in the dog are the front and hind legs on the same side, whereas in the horse they are the legs on the opposite sides.

The analysis of horse gait also addressed a major question of racehorse enthusiasts of Chubb's day: Is a horse going full speed ever entirely off the ground? He concluded the horse is suspended in air approximately one-fourth of the time.

Some other museum osteologists in the early part of the century were interested in getting action into skeleton mounts. "But none of their mounts were as lively or had the beauty of a Chubb mount," says Marie Lawrence of the American Museum of Natural History. "His have an odd kind of symmetry, which I can admire, being a bone person myself, because he studied the skeleton and got it right. His mounts are balanced and beautiful from any view." □

Behind the skeletal mount of a draft horse in this scene from the museum exhibit is a photo sequence of a horse pulling half a ton, taken by Eadweard Muybridge.



J.A. Miller



Chubb took the above photograph of a trotting horse while suspended from the museum roof (see cover photo). He used a white line and spots to highlight the spine, hip and muscle movements, and the horse's shadow to reveal the footfalls.