WILDLIFE PRESERVATIONS

natural history exhibit services

# RECONSTRUCTING A VAMPIRE BAT


As Seen in *Breakthrough* #94

*by John Scott Lucas*

George Dante

# Vampire Bat Re-Creation

GEORGE DANTE HAS TACKLED A LOT OF unusual requests in his career. As the "go-to" taxidermist for the American Museum of Natural History (AMNH), in New York City, he has restored rare bird and mammal specimens from that institution's world-famous habitat dioramas. A recent job for an exhibit celebrating the 200th anniversary of the birth of Charles Darwin, now on display in Lisbon, Portugal, gave George the opportunity to create sculptures of plants and animals endemic to the Galapagos Islands, including giant armadillos, Galapagos tortoises, Sally Lightfoot crabs, and the rare daisy tree. George's success with projects such as these has begun to generate an increasing number of museum jobs. Many of these jobs are one-of-a-kind, which means George has had to constantly challenge himself to do things he has never done before.

**Lateral Thinking**: According to George, the key to problem solving is having a broad bank of knowledge to draw upon, because you never know what your client is going to ask for when the phone rings. George said, "I've borrowed ideas and techniques from dressmakers, woodcarvers, set-designers, modelmakers, jewelers, and all sorts of artists. I really want to impress on the reader that, in our industry, we need to immerse our-

selves in a variety of arts and sciences. Almost any skill can be adapted to your needs if you keep an open mind."

To demonstrate this principle, I am going to look at the specific techniques that went into sculpting a model of a vampire bat. George explains, "A lot of the techniques I used here were techniques that I had used on other more traditional jobs in the past."

The vampire bat job came to George through Betsy Loring, Manager of Exhibits and Collections at EcoTarium, a small zoo and natural history museum in Wooster, Massachusetts. EcoTarium was producing an exhibit on sanguivores (sanguivores are animals that feed exclusively on blood, such as mosquitoes, lice, ticks, leeches, and vampire bats). Betsy had been unable to locate a model of a genuine vampire bat specimen, so she contacted George, who had created animal models for a previous exhibit at EcoTarium. Betsy wanted a vampire bat posed in an aggressive stance with an open mouth.

George explained, "It was a small job, but I really liked the challenge of getting so much detail into such a small space."

**Research:** All of George's jobs start with research. "Normally, when I get a job like this," says George, "I go to the AMNH for the day to view specimens, but due to the small budget, I didn't have that luxury. Instead, I contacted Bat Conservation International (BCI), in Austin, TX." BCI faxed George reams of information on vampire bats. George also used Google to search for photo and video reference.


**SCULPTING THE HEAD.**

**1.** George purchased a reproduction skull and mandibles of a common vampire bat from Skulls Unlimited, which not only accelerated the process of sculpting the head, but also provided the scale for the body.


**2.** George sculpted soft tissue directly onto the skull using Apoxie Sculpt. He started with the palate and the inside of the lower jaw, and then attached the mandibles to the skull.


**3.** George sculpted the tiny ears out of thin aluminum sheets. This was no different than any other kind of metal sculpture, except that it was on a very small scale. He used a jeweler's stand to hold the ears, and a hobbyist's illuminated magnifying lens to see the tiny details.


**4.** George evened out the texture of the ears and added more detail by applying a thin layer of Apoxie Sculpt.


**5.** Using dental tools to apply and shape Apoxie Sculpt, George created the facial features, starting from the snout and working back. Notice that he keeps all his tools and his photo reference close at hand. This helps him work efficiently.


**6.** In this photo, the nose, lips, and fangs are complete, and the rest of the features of the head are massed out.

**7.** George ordered the smallest glass eyes that Tohickon sells. These solid black eyes are aproximately 1 mm. in diameter, and come with wire stems attached. Once the eyes were set in the eye sockets, George sculpted eyelids over them. He then sculpted in fur texture all around the head.

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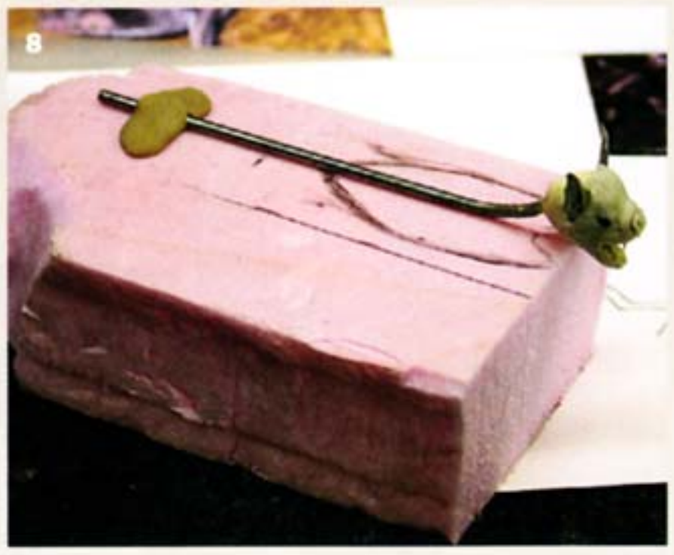
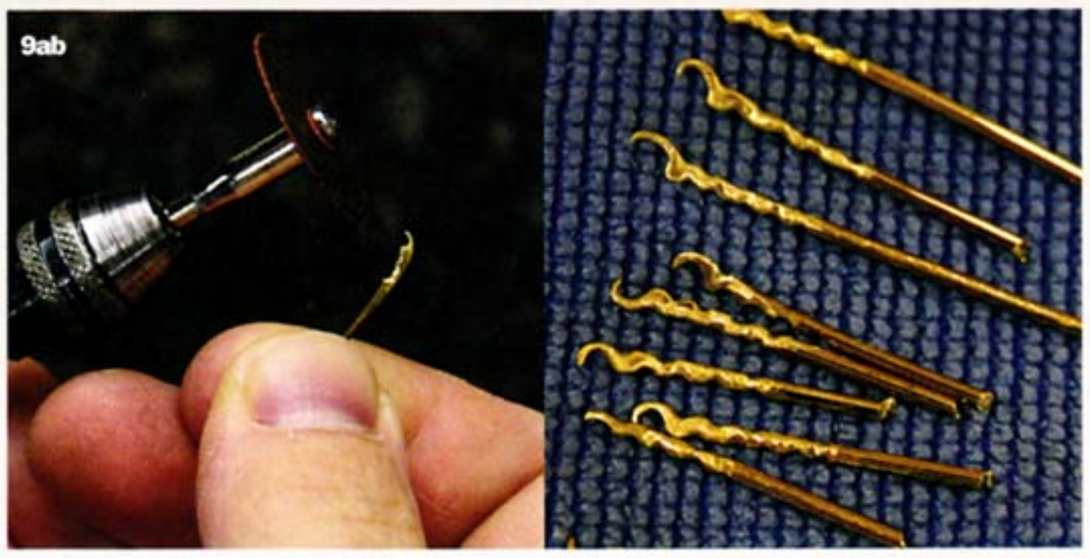


**8. Massing out the Body.** George adapted a simple technique he learned from carving fish to make the body of the vampire bat. He started with several formal sketches in his plan and elevation view at 1:1 scale, using the head as a guide. He then copied the sketch onto a small block of Styrofoam and carved out the basic shape of the body.



**9ab. Constructing the Legs and Wings.** The bones of a vampire bat are clearly visible beneath the thin membranes of skin on its legs and wings, so George needed to sculpt a lot of detail into these tiny appendages. This time, he borrowed skills he learned from creating feet for woodcarvings of songbirds. He fabricated the bones out of thin brass wire, using various gauges as necessary to create the proper thickness. Once again, he started with 1:1 sketches. George then used a Dremel tool grinder to create each individual toe bone and the claws on the end of each wing. The brass wire allowed him to sculpt minute but durable talons with a lot of detail.

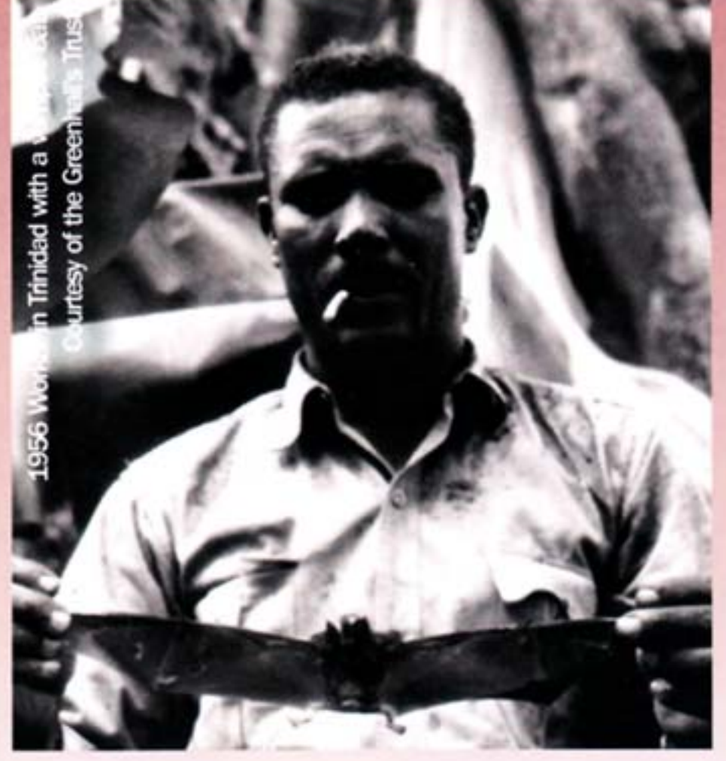
**10.** Once George had completed all the toes, he bound them together with thin wire to hold them in place.

**11.** He then brazed each assembled foot to a longer section of brass wire to create an ankle.

**12.** The wing bones were constructed in a similar manner. Using a full-scale sketch as a guide, George bent a single piece of brass wire into the general shape of the humerus and ulna.

# THE UNGLAMOROUS LIFESTYL

LET'S GET ONE THING STRAIGHT RIGHT now. You really don't need to worry about vampire bats sucking your blood. Honestly. I'm not saying that it never happens, but the chances are pretty slim. Of the 1,100 known species of bats in the world, only three are vampire bats. They are the common vampire bat (*Desmodus rotundus*), the white-winged vampire bat (*Diaemus youngi*), and the hairy-legged vampire bat (*Diphylla ecaudata*). These three species are only found in tropical to semi-tropical environments in Mexico, Central America, South America, and the Caribbean islands of Trinidad and Margarita. This means that there are no vampire bats in Transylvania or anywhere else in Europe, Asia, Africa, Australia, the United States, and Canada. Even if you happen to live within the habitat range of vampire bats, your chances of being bitten are not great, because like all predators, bats go for the easy meal. The most common species of vampire bat,



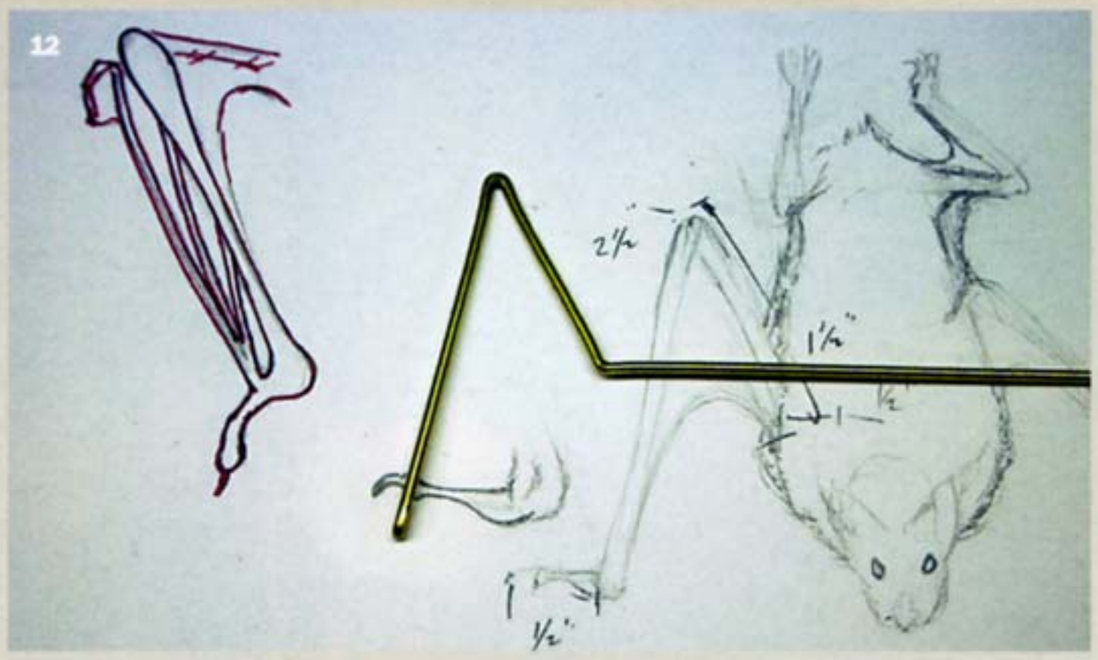
1956 Wo[illegible] in Trinidad with a [illegible]
Courtesy of the Greenwall's Trus[illegible]

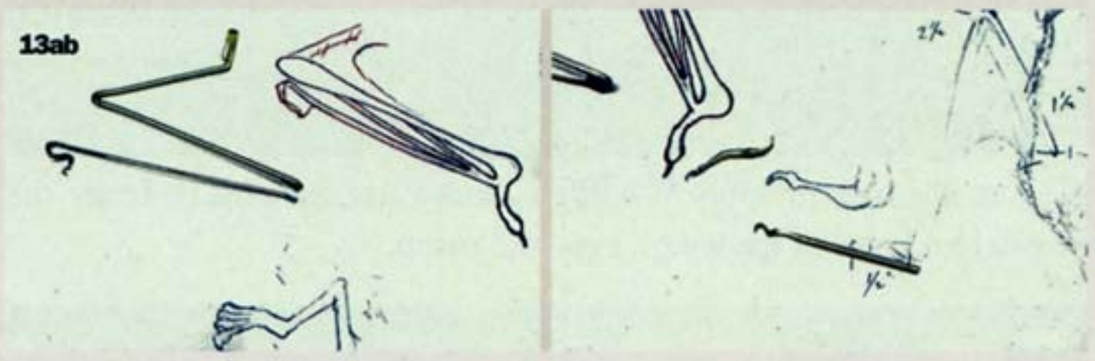
*Desmodus*, has been known to occasionally feed on humans, but generally, they prefer to pick on livestock. The relatively less common species of *Diaemus* and *Diphylla* prefer birds, mostly domesticated chickens.

So, unless you routinely sleep on the ground in places like the Amazon jungle (which, by the way, isn't a great idea for a lot of reasons), you really don't have to worry about bats sucking your blood.

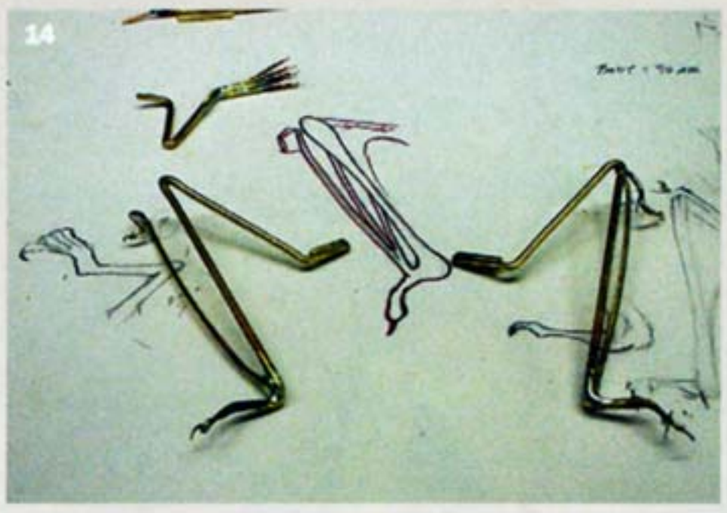
This is not to say that vampire bats make good pets. I personally think bats are kind of cute from a safe distance, but vampire bats have evolved some truly revolting adaptations to deal with an all-blood diet. These adaptations include razor-sharp teeth, the ability to distinguish between individual animals by their breathing patterns, and noses equipped with heat-sensing organs.

Vampire bat colonies can include up to thousands of individuals, often roosting alongside other species of bat, but while vampire bats love a slumber party, they prefer to hunt alone. When a vampire bat locates a host, such as a sleeping cow or goat, it lands nearby and sneaks up on its victim on all fours. Most species of bats are




**13ab.** George used a thinner gauge of brass wire to create the elongated metacarpal bone that supports the distal section of the wing and the tiny second toe. He then used a Dremel tool to carve details into the wire.




**14.** Finally, he soldered all the pieces together.


**15ab.** Fins on fish models are created by stretching clear packing tape across wire armatures. George adopted this technique to make the wing membranes and the membrane between the legs and the rump.


**16.** George then cured the tape and brass wire with Mod Podge.

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# E OF A BLOODSUCKER

awkward on the ground, but researchers at the College of Veterinary Medicine at Cornell University have discovered that vampire bats can do more than just walk – they can practically gallop. Daniel Riskin and John W. Hermanson described this phenomenon in a recent issue of *Nature* (March 17, 2005). The bats propel themselves with their elbows, running more like a small gorilla than a mouse.

Once a vampire bat has made its way onto the body of its sleeping victim, specialized thermoreceptors on its nose help it locate areas on the skin where the blood flows close to the surface. If the host animal is furry or hairy, the vampire bat uses its canine and cheek teeth like a barber's blades to shave away the obstructing hairs. The bat then makes a tiny incision in the skin with its upper incisors. These teeth lack enamel, which keeps them permanently razor-sharp. The incision doesn't have to be very deep, because the bat's saliva contains draculin, an anticoagulant. It takes a vampire bat around ten minutes to drink about a tablespoon of blood. This may seem tiny, but for a bat, it's about 20 to 30 percent of its total body weight.

Since it takes a lot of work to stalk a victim and tap its blood, vampire bats prefer to feed on the same individual over the course of several nights. But how does a bat find its way back to the same animal it fed on the previous night? A study conducted by Udo Groeger and Lutz Wiegrebe from the Ludwig-Maximilians-Universitaet in Munich, Germany, published in the on-line journal, *BMC Biology*, suggests that the common vampire bat can recognize differences in breathing patterns, much in the same way humans recognize voice patterns.

If a bat fails to get adequate food during foraging, it may get a free meal from another vampire bat in its colony. Vampire bats store undigested blood in a small pouch-like section of their stomachs for just such emergencies. The donor bat regurgitates the blood into the mouth of the recipient bat in a manner similar to kissing. It's kind of a professional courtesy.

**To Find Out More:** The International Union for Conservation lists vampire bats as "least concern" on their list of endangered mammals, but many other species of bats are listed as "threatened" to "critically endangered." http://data.iucn.org/dbtw-wpd/edocs/2001-008.pdf.

Bat Conservation International (BCI), based in Austin, Texas, is devoted to conservation, education, and research initiatives involving bats and the ecosystems they serve. Visit their excellent website to find out what you can do to protect bats around the world. Check out their education section to find out what to do if you discover a bat inside your home, office, or barn: www.batcon.org/index.php/education/bats-and-the-public.html.


**Painting the Head and Assembling the Body.**

**17.** George attached a short wire to the back of the head to create a neck. He kept the temporary armature on until he was ready to attach the head to the body.


**18.** Working from photo reference, George painted the head with acrylic paints. He began with a light wash of black to bring out the details, and then built up the color of the fur in layers.


**19.** Once the head was fully painted, George snipped off the temporary armature and attached the head to the body. He then fixed the position of the legs and wings.


**20.** Apoxie Sculpt was used to blend the head and legs onto the body.

**21.** After gluing the wing armatures to the body, George sculpted in the shoulder and pectoral muscles with Apoxie Sculpt. He then used an airbrush to apply Wildlife Colors Paint Systems to create the brown base color of the wings, legs, and rump.



**22.** Next, George sculpted the fine muscle and bone details of the forearms with Apoxie Sculpt. Because these parts were going to be pink and lighter in color than the rest of the wings, it made sense to add them *after* the broad areas of brown were airbrushed on.

**Adding Fur and Flocking.**


**23.** "Because I do a lot of restorations," George said, "I always keep a large selection of pelts on hand. I've become a real pack rat, but in this business, that's a good thing!" Tanned moleskin proved to be a perfect match for the brown fur on the vampire's back.

George wanted to use one single piece of skin to cover the body, but the moleskin was flat and the vampire bat's body is essentially egg-shaped, so he used the sanding head of a Dremel tool to sand down the leather side of the tanned skin until it draped over the form like a piece of wet paper towel.


**24.** George used surgical scissors and an X-acto knife to trim the thinned moleskin until he was satisfied that he had a snug fit with even unions at the seams, particularly around the neck, wings, and feet junctures. Once the pelt fit the body form like a glove, he glued it on with Devcon 5-minute epoxy.


**25.** Long before he started this job, George had bought a scrap of kangaroo skin from a shop that sells materials for tying fishing flies. It was an impulse buy that paid off, because the kangaroo skin was a perfect color match for the lighter-colored fur on the belly of the vampire bat. Since kangaroo skin is too thick to be sanded down and the length of the fur was too long, George shaved the fur off the skin with a scalpel and then minced it with the same scalpel to make flock. He then brushed on a coat of adhesive over the belly of the vampire bat, and applied the flock over it.


**26.** George used flocking to cover up the seams in the moleskin, and to make a smooth transition between the head, legs, and wings. He learned this technique from taxidermist Manny Barrone, who used to work on a lot of African specimens. Specimens from Africa invariably arrive in the States ravaged by insects and rodents, so Manny had a lot of experience repairing pelts. He showed George how flocking could be used to repair almost any sort of damage. George first made brown flock from scraps of moleskin. Then he painted water-soluble adhesive on the spots where he wanted the flock to stick. The static cling of a dry synthetic brush is sufficient to attract the fibers of the flock, which can then be placed onto the wet adhesive and smoothed into place.


**27.** Flock helped George to make a seamless transition from the sculpted fur on the head of the vampire bat to the actual fur of the moleskin pelt.


**28.** The next step was to add fur to the fine membranes on the wings and back legs, using commercially available synthetic flock fibers. He blended different colored fibers together to achieve the precise tone, much as one might mix paint. This flock was applied in the same manner as in previous steps.


**29.** The final step was to fabricate a tongue out of pink Apoxie Sculpt and place it into the mouth. A bit of high-gloss clear acrylic sealer gave the mouth a moist effect.

**30.** It took George about three and a half days of work to finish the vampire bat. The completed model arrived at EcoTarium on a Friday, after a disastrous week that culminated with the roof of the museum developing a leak. The curator of the museum was in a miserable mood, but

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when he saw the vampire bat model, he was so excited that he ran through the halls of the museum showing it to everybody on the staff. ■

*JOHN SCOTT LUCAS made his first contribution to* BREAKTHROUGH *with the two-part article "Reconstructing a Dodo," in issues 86 and 87. He is a marketing, public-relations, and communications professional with a wide variety of skills. John has a BA in history from George Washington University and a master's in professional writing from the University of Southern California. He lives above the world's best coffee shop in historic Tarrytown, NY, with his wife, Petra, and their two black cats, Boo and Scout. John is currently looking for work. Contact him at JSLsurf@yahoo.com.*

*GEORGE DANTE started his own taxidermy business as a part-time job in high school. In recent years, he has become the "go-to" wildlife artist for many natural history museums, including the American Museum of Natural History in New York City, the Harvard Museum of Natural History, the New Jersey State Museum, the Vanderbilt Museum, and EcoTarium. An artist first and foremost, George graduated from the prestigious School for Visual Arts with a BA in fine arts. His sculptures, paintings, and illustrations have been exhibited in numerous New York City art galleries. George's many awards include the 1997 National Championship for a Reproduced Fish and an NTA Award of Excellence. He is also an NTA-certified judge. George recently moved his company, Wildlife Preservations, to an expanded studio in West Paterson, NJ. Find out more about George's work at: www.wildlifepreservations.com. Contact George directly at (973) 890-1516 or wpstudio@optonline.net.*