NO FEAR

of Mounting Small or Micro-Mammals

BY BEREND KOCH

MOUNTING SMALL AND MICRO-MAMMALS IS very demanding. To avoid or at least reduce the shrinkage, especially for the small mammal group, there have been developed some different methods with often good results. But for some taxidermists, the use of pure polyethylene glycol (PEG) is not sufficient, a vacuum pump isn't at hand, or a freeze dryer isn't available. The method which I will describe should be usable in nearly every taxidermy studio without the need for expensive equipment.

The combination of traditional mounting techniques with the use of PEG is the key to success with this method. You will find the step-by-step explanation of preparation, skinning, and skin preservation with ethylenglycolmonophenylether, mounting with a urethane foam manikin, and epoxy modeling paste, reducing shrinkage with the help of PEG, the finishing, and finally, the coloration.

Storing and thawing of the specimen: In most cases a client will bring the collected animal for mounting frozen in a plastic bag to the taxidermy studio. But sometimes you will get one fresh.

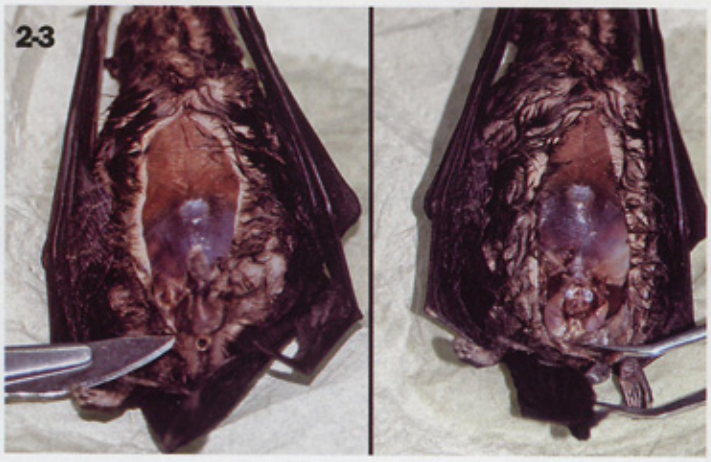
The best way to store a fresh dead micro or small mammal, like a bat or mouse, is to store it relaxed in a water-filled container and put it in a freezer. Frozen in a block of water there won't be problems with freeze drying or with distorted ear butts. In this case you should note the fresh weight on the tag or documentation sheet of the specimen before putting it in the water.

Otherwise, I first weigh and then I thaw the frozen specimen. Thawing a frozen specimen is a very important step. Small insectivores like bats, shrew, or moles spoil and loose their epidermis very quickly after death; small rodents are slower in rotting. To prevent rotting, I use a cold 2- to 4-percent thawing salt solution with some washing detergent and bactericide added.

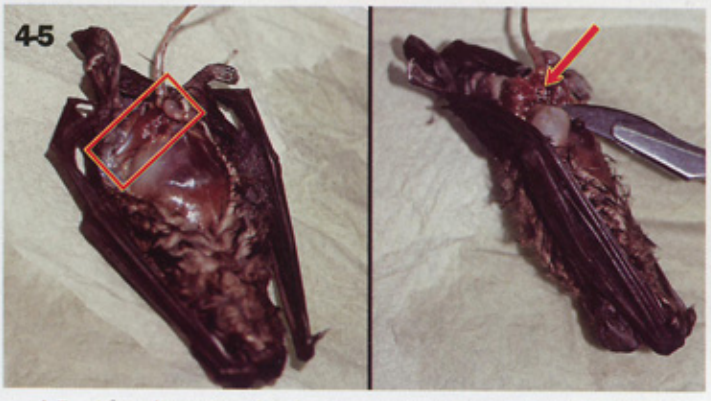
If the specimen was not frozen in water to prevent dehydration and some areas (e.g., lips, nose, feet, tail) are dried from a long period in the freezer, inject some thawing solution using a syringe with a fine needle.

1. I then take the necessary measurements for the documentation. In case of bats, measuring the length of the forearms, ears, and tragi is necessary in addition to the other measurements.

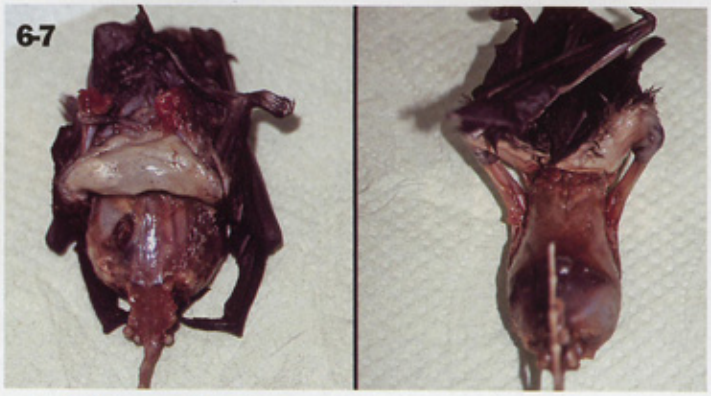
Skinning: I then skin the mammal as usual and clean the skin (removing all fat and tissue), and also the bones of the extremities and the skull, which remain attached to the skin.



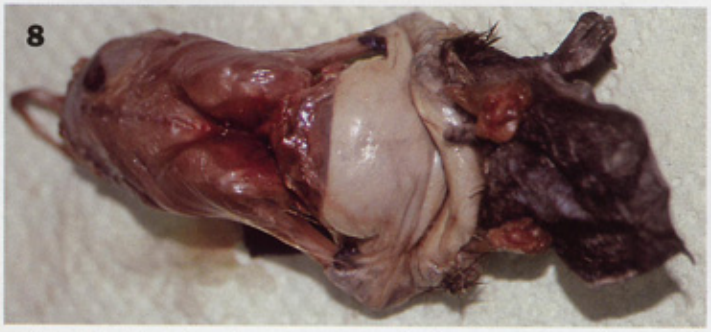
2-3. I use a ventral cut with bats, from the base of the throat over breast and belly to the anus. Be careful while cutting not to damage the genitals and anal opening because they are sometimes criteria for determination. To detach the skin from the tail, use your fingertips or some tweezers as a tail-skinning tool, held on either side of the flesh, and pull the tail bone out of the skin. That should be easy to do if the tail is completely soaked.



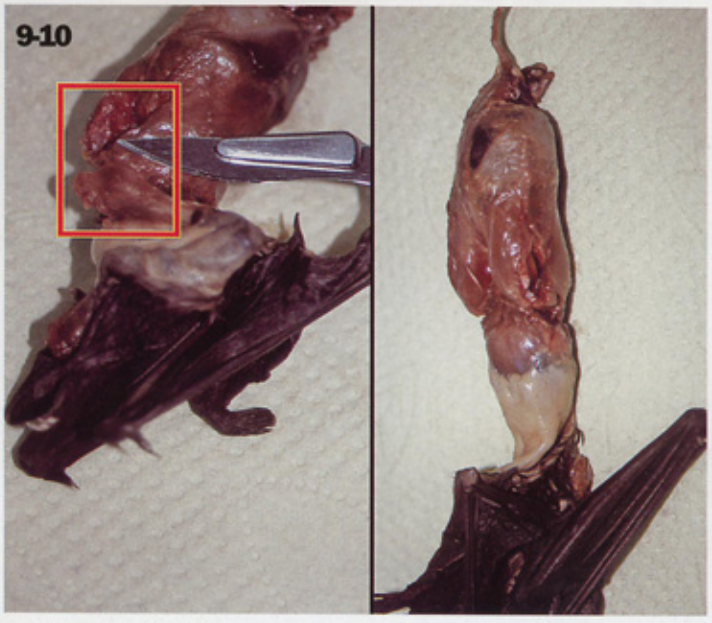
4-5. After dissecting the thighs, separate them at the pelvic bone.



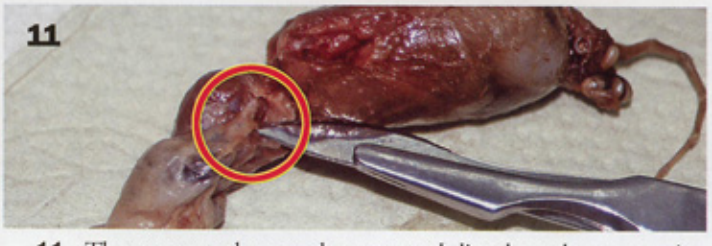
6-7. Now pull the skin over the back to the shoulders.



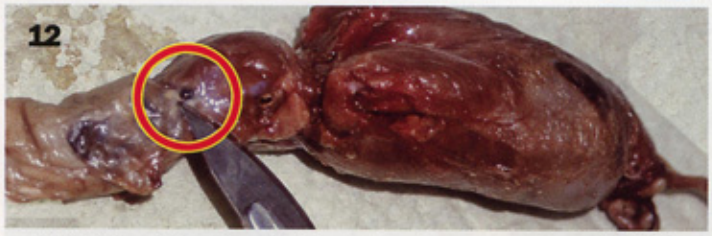
8. After dissecting the upper arms, the huge scapulae and the neck-to-skull junction are visible.



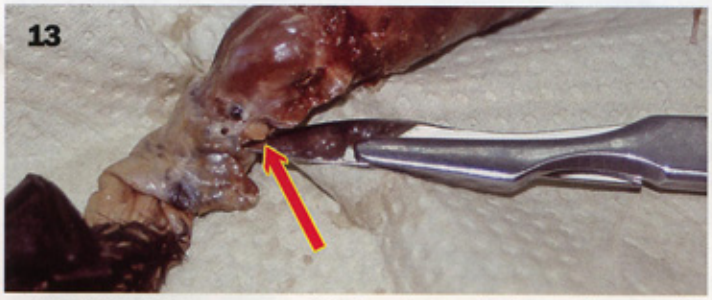
9-10. Separate the upper arms at the shoulder joints and pull the skin forward over the skull.



11. Then separate the complete ear canal directly at the ear opening on the skull with a careful cut.

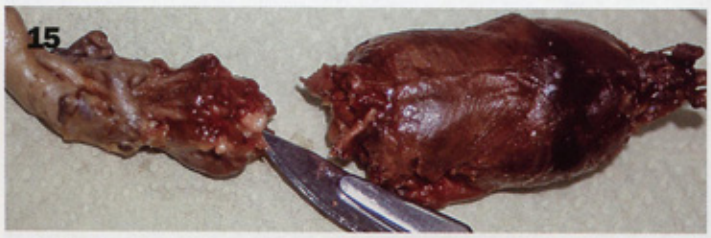


12. After pulling the skin forward to the eyes, cut through the inner eyelids, exposing the eyeballs.



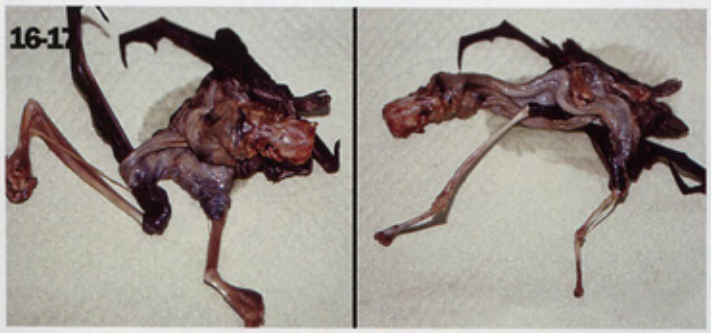
13. Only for bats: remove the glands around the nose because this area could shrink in spite of using polyethylene glycol (PEG).

14. Now only the lips and the nose cartilage connect the skin with the skull.



15. Then the head is separated from the body with a cut between the back of the head and the neck.

While cleaning the skull don't damage the connection between lips/nose and head. Don't split and thin down the lips/nose/ears because the complete tissue will be used in the later process.



16-17. The next step is skinning and fleshing the legs and arms. Don't pull the skin of the legs and the arms over the ankle/wrist because these areas will be cured later with PEG!

Remove all meat, fat, and tissue from the skin and bones and then wash it out with detergent and rinse out with clear cold water. I recommend products of the tanning industry because they are aligned to the chemical characteristics of skin and fur.

Now the skin is ready for preservation.

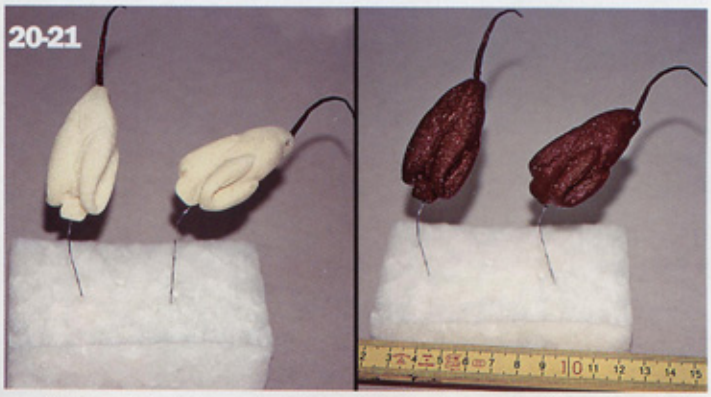
Skin Preservation. I use a solution based on water with 2-volume percent of ethylenglycolmonophenylether and 2-volume percent of concentrated formalin (37 to 40 percent).

18. With the help of the ethylenglycolmonophenylether, the skin remains soft in spite of using formalin. Let the skin soak in the solution at least for one week (better for two weeks). Even three months is allowable.

Look at the vibrissae [whiskers] of shrews or rodents. They should be arranged before soaking!

Mounting procedure. Make a sketch of the carcass with the tail for later use and reference.

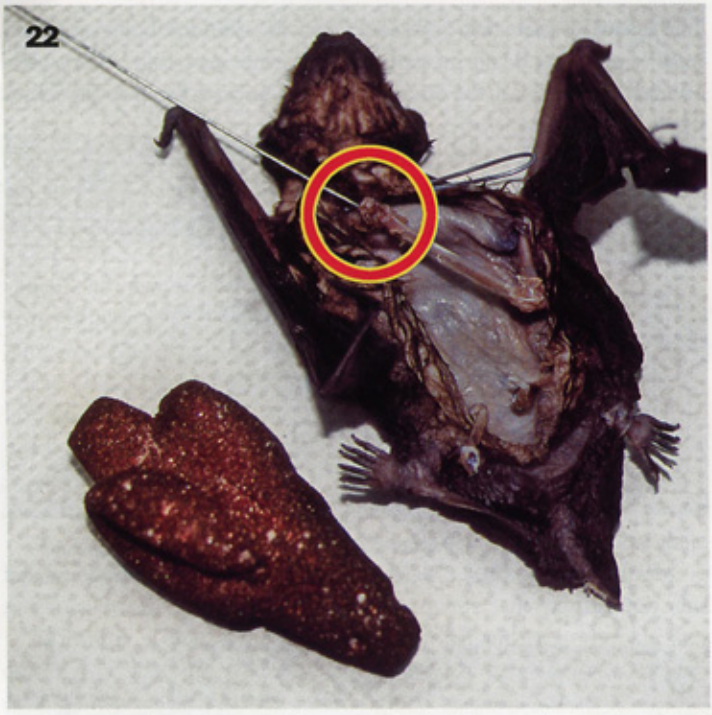
19. I carve a manikin out of a piece of polyurethane foam, but you can also make a carcass cast while the skin is in the solution.



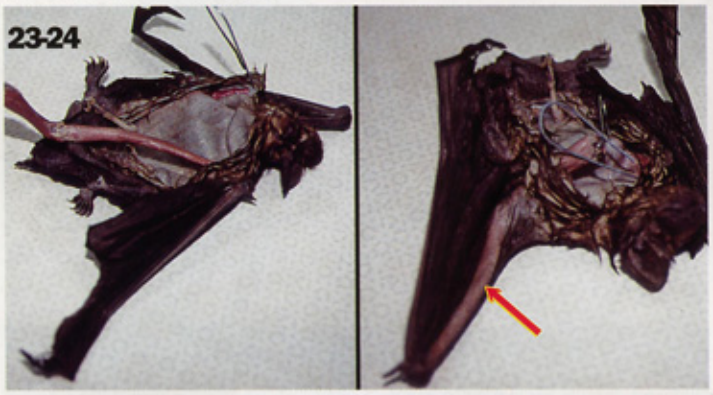
20-21. After fine-tuning I pre-color the foam manikin with reddish brown (muscle color) water-based acrylic colors.

The tail is wrapped with cotton and fine thread, sealed with white glue and also pre-colored.

For micro-mammals like bats, mice, or shrews, I use "silver" (silver galvanized copper) wire for legs, arms, and tail (0.4, 0.6, 0.8, or 2.0 mm) which I buy at arts and crafts shops. For larger small mammals, like hamsters or rats, I use zinc galvanized wire as usual.



22. With bats it is possible to insert the sharpened wire first inside the humerus, through the elbow joint, and finally into the forearm bones.



23-24. Now it's possible to rebuild the muscles with pre-colored Apoxie Sculpt. After pushing back the arm into the skin, the color is shining through the skin and gives a nice, authentic looking effect.

25. For perfect recycling I use the wire of the used black glass eyes for attaching the skull to the foam manikin. The U-bent and sharpened

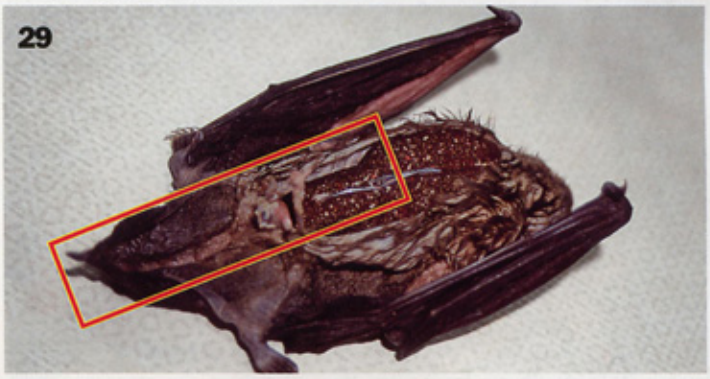
wire is inserted into the calvarium just behind the orbit and leaves the skull through the opening at the base of the skull (occipitale).

26. Then place the skull on the neck and insert both ends of the wire through neck and manikin and bend them into the ventral side of the manikin.

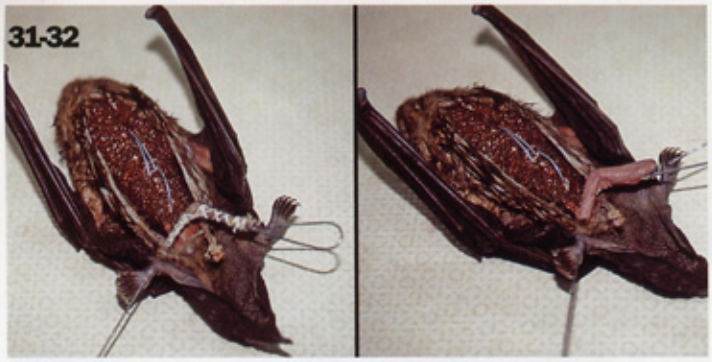
27. Now it's time for re-creating the muscles of the skull, neck, and the glands with pre-colored Apoxie Sculpt, and setting the glass eyes. I recommend leaving some space for the ear canals so that the ears finally will be located at the right place.

After pulling back the skin over the skull, a nearly perfect face should be visible. It's the right time for positioning the eyelids and ears.

28. The arms are positioned and fixed at the shoulders like the wings of a bird. It's easy to push the sharpened silver wire through the foam manikin and then secure the ends by bending them into the manikin. The transitions between arms and shoulders are rebuilt with pre-colored Apoxie Sculpt.

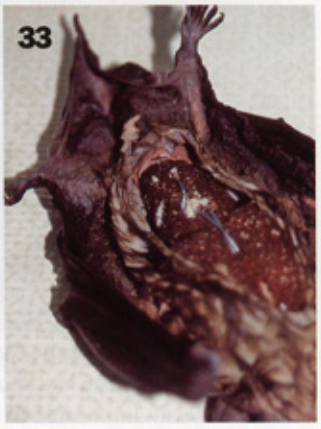


29-30. Before wiring the legs, an artificial tail is thinly covered with white glue or hide paste and inserted into the tail skin. Contrary to the arms, it is nearly impossible to insert the wire invisibly into the solid bones of the legs. So the sharpened "silver" wire is inserted from the outside through the sole of the foot and directed along the tibia/fibula and the thighbone.



31-32. Then the wire is fixed by wrapping it to the bones with thread. The muscles are rebuilt with pre-colored Apoxie Sculpt.

33. Before fixing the legs, the tail wire should be affixed to the manikin.



34. All transitions and visible wires are covered and smoothed with pre-colored Apoxie Sculpt.

Then I bring a little hide paste to the back and the shoulders with a fine spatula and arrange the skin from the outside by slight massaging.

For sewing up the ventral incision, I use the finest needle I can find with nearly-invisible nylon thread. These are also the right tools for repairing work, for example, at the flying webs.

After finishing these steps successfully, it's time to align the skin to the right places on the manikin and give the mount the final position. Because you're using pre-colored Apoxie Sculpt, you must work quickly.

If you are satisfied with your work, the mounting process is finished. Normally a drying process follows, but most of you know from experience that shrinkage while drying is the main problem with these very small mammals.

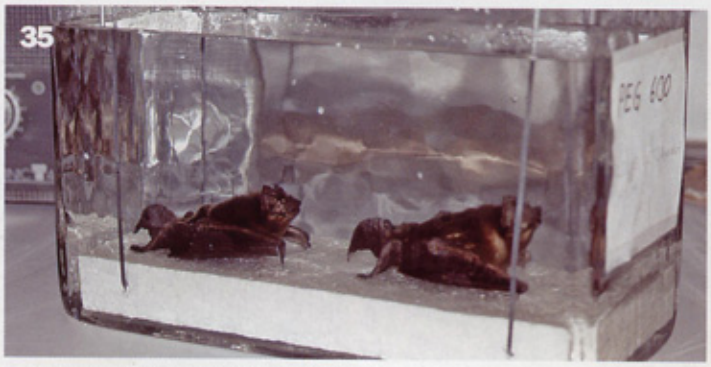
Freeze-drying could be a solution to prevent or minimize these problems, but not everyone is able to afford an expensive freeze dryer, and not every customer likes freeze-dried mounts.

My technique is not to dry now, but to soak the mounted bat to eliminate shrinkage when it dries later.

Why Apoxie and not clay? The solution that prevents shrinkage is water-based and would otherwise soften the clay! Why pre-coloration? You will get a very lifelike effect because the color will shine through the skin, especially on hairless areas, and that spares finishing work!

Preventing shrinkage with polyethylene glycol (PEG). After the small mammal is mounted, I inject some formalin 3 percent into problem areas like the lips, nose, and feet to stabilize them and to give them more volume. Be careful, don't overfill. I inject formalin especially when these areas were injected with thawing solution during skinning.

I mix three water-based solutions with different PEGs and fill them in containers (e.g., glass aquariums).



1. distilled water with PEG 600 (1 : 1)
2. distilled water with PEG 1500 (1 : 1)
3. distilled water with PEG 4000 (1 : 1)

The mount will float because of the foam manikin, so fix it with the leg wires on a plate which will hold it on the bottom of the aquarium. I use a construction with Styrofoam, stainless steel wire, and a weight from top, or weighted-down foam plates.

35. Then I put the mount on the Styrofoam plate completely in the first bath with PEG 600. The mount should soak for at least one week (micro-mammals), but it's better to soak four weeks or longer (small mammals). A longer period doesn't matter.

36. After the first bath let the solution drain.

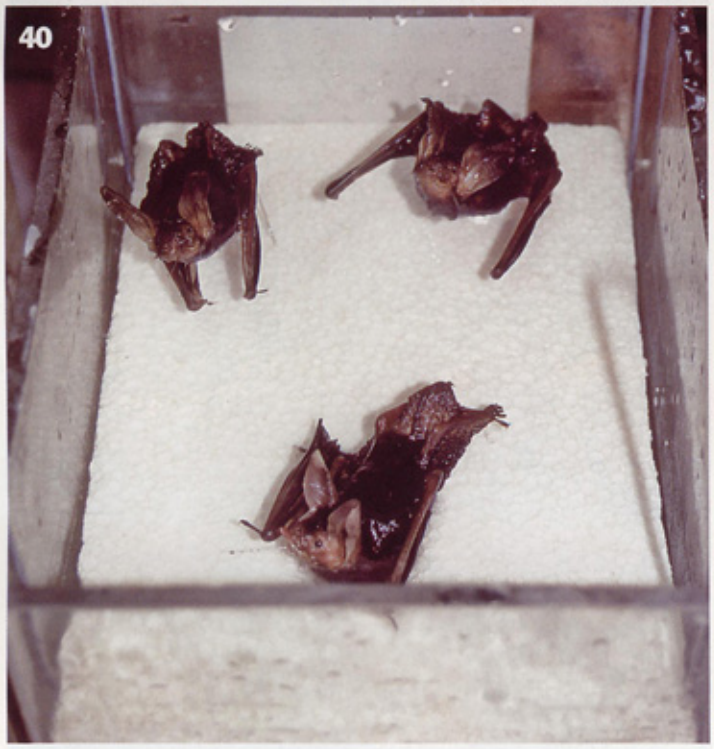
37-38. Rinse out the mount under flowing clear water for a very short time and dab the

liquid off with paper towels. Then fix it on the next plate for the next bath, now in PEG 1500 solution.

39. Repeat the procedure and do the same with the PEG 4000 so-

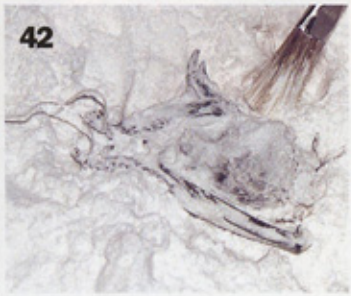
lution. I have had some mounts in the final PEG 4000 solution for nearly two months. Caution: If using zinc galvanized wire, corrosion is possible after a longer period in the PEG solution.

40. After draining the PEG 4000 solution, be careful to not wash the PEG out of the ears, flying membranes, etc., when the mount comes



freshly out of the PEG solution. Avoid using a strong jet of water.

41. After drying with paper towels, brush potato starch with a



paintbrush or toothbrush into the hair to absorb the liquid as much as possible.

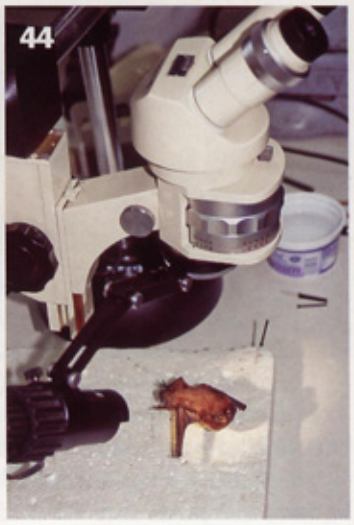
42. Then put the mount completely into potato starch and let it dry for the next 2 to 4 weeks. After it has complete dried, the PEG is fixed and you can brush out the potato starch and wash out the PEG-potato starch crust carefully. Sometimes compressed air is helpful to blow out the fur and it supports removing the potato starch.

43. As usual it's recommended to mount as many as possible of the same or similar species to establish a routine.

If you aren't satisfied with the arrangement of the ears or the toes or if the ears are not in the right shape after drying – no problem! As you know, PEG is water-soluble and with a very small amount of heated water and a modeling tool, it is possible to make those fine parts flexible again and to adjust them in the desired way. Then after having cooled down, the PEG hardens again.

Finishing. First of all, very good reference material is essential. There are a lot of very good books on the market where bats, mice, or shrews are shown in photos.

44. Normally it is necessary to do some finishing work, if only to re-create the moisture around the eyes. But by using the described method, finishing is reduced to a minimum. I use Apoxie Sculpt and an airbrush with water-based acrylic colors, and in the case of competition purposes for the very small ones—a microscope. The effort depends



on the intention of the mount. But whether for commercial or competition purposes, the result should be as lifelike as possible. ■

To buy polyethylene glycol, (PEG) visit:
http://en.wikipedia.org/wiki/Polyethylene_glycol
http://www.rockler.com/findit.cfm?page=686
http://www.2spi.com/catalog/chem/labels/poly.shtml
http://www.chemicalland21.com/industrialchem/organic/POLYETHYLENE%20GLYCOL.htm

BEREND KOCH has been a taxidermist at the Institute of Zoology of the Technische Universitaet, Darmstadt, Germany since 1988. You may e-mail him at koch-b@bio.tu-darmstadt.de. Here is his list of awards:

1992: A third place in the bird category at the 1st European Taxidermy Championships in Leiden, Netherlands (herring gull)

1995: A second and a third place at the 2nd European Taxidermy Championships in Oslo, Norway (goldeneye and wigeon)

1996: The second place, Biological Mount category at the German Taxidermy Competition in Frankfurt, Germany (shag).

1997: Two first places and a third place, Professional Division, at the World Taxidermy Championships® in Springfield, Illinois (two jays and a pine marten). Second Best of Category Birds, Professional Division.

1998: A first place at the 3rd European Taxidermy Championships in Riihimäki, Finland (herring gull). Second Best in Europe award, category Large Birds.

1999: Second Best of Category Mixed Group in the Collective Artists Division at the World Taxidermy Championships® in Springfield, Illinois (two grey partridges with a roedeer fawn) in cooperation with Dieter Schoen (Pfarrkirchen, Austria)

2000: The second Best of Category Small Birds (golden oriole) at the 5th Swiss Taxidermy Competition in Bern, Switzerland

2000: A first place at the 4th European Taxidermy Championships in Chambord, France (grey wolf). Third Best in Europe Large Mammals.

2001: Best of Category Birds and Best in World Collective Artists at the World Taxidermy Championships® in Springfield, Illinois (two European starlings) in cooperation with Matthias Feuersenger, Mannheim Reiss-Museum/D.

2001: The second Best of Category Birds at the German Taxidermy Competition in Manderscheid (white-tailed eagle)

2002: A first place at the 5th European Taxidermy Championships in Longarone, Italy (white-tailed eagle). Third Best in Europe Large Birds.

2005: Best of Category Med.-Small Mammal Group, Master Division (Leisler's bats) and Third of Category Med.-Small Mammal, Small, Master Division (particolored bat) at the World Taxidermy Championships® in Springfield, Illinois.

2006: Best in Europe...(serotine bat), Best in Europe Animal Groups (particolored bats) and Best Professional Animal Groups (Bechstein's bats) at the 7th European Taxidermy Championships in Longarone, Italy.

FINISHED BATS BY BEREND KOCH USING THE DESCRIBED METHOD