MINUTE SHELLS - Part 2

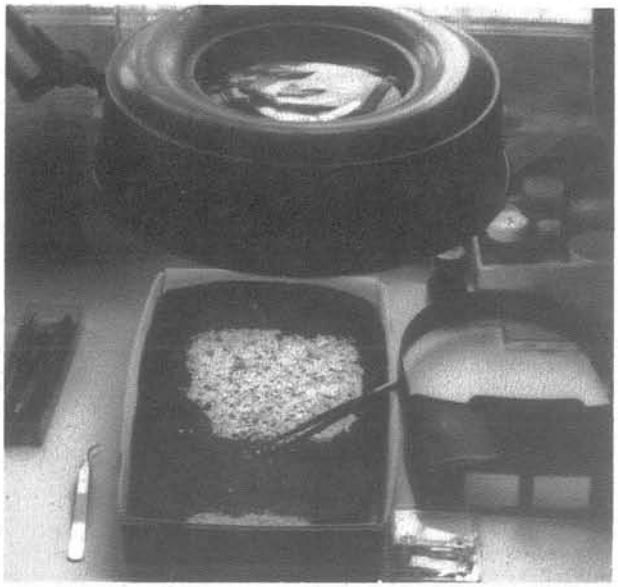
by Bert Draper

Small and minute mollusks may be found almost anywhere larger species are found. A few species live on exposed rocks, some are found in intertidal gravel and debris washed up by the waves, and a few more species will show up on the undersides of turned rocks. But by far the best collecting of minute shells is from the fine gravel and sand taken from under rocks, in kelp holdfasts, from eelgrass roots, and in or under coral. Also areas around sea anemones, algal growths, gravel inside larger dead shells, in sponges, and even the stomachs of sea stars are often quite productive of small mollusks. The finer material taken by dredging or bottom grabs is usually also very good hunting for minute shells. All such fine material is referred to as grunge. The handling of this grunge and sorting out the shells in it is a very important step in the collecting of minute shells.

It is best to wash all grunge first, to clear it of mud and organic material. This is best done in a large pan or tray, and care must be taken not to wash away any tiny mollusks which are often too small to be easily seen with the unaided eye. After washing and drying the grunge in pans or trays, the larger rocks, shells and other material should be removed. A coarse screen will do this quite well; not less than a quarter-inch mesh is best. Then the grunge that is left can be put aside in jars or plastic bags to be sorted as time permits. Be sure to place labels in each lot giving collecting data and date.

Sorting of grunge should be done in small lots, placed in a flat tray and sorted with tweezers under a good light such as a Tensor lamp or desk-type fluorescent lamp. A large magnifying glass on an adjustable mount, or binocular magnifiers worn on the head,

Typical mixture of minute shells from grunge dredged in the Gulf of California, off Isla San Lucas, 1969. Magnified 10X.



Sorting tray with grunge and tweezers; lighted magnifying lens and on the table, magnifying binocular eyepiece.

are very good for finding the small shells down to about 2 mm. in size. But after the grunge has been sorted in this manner, do not discard it yet. Sift it again through a finer screen or sieve of from 1/16 of an inch to 1 millemeter mesh; then sort through this very fine grunge under a microscope to find the truly minute shells that have been passed by up to this point. Small quantities of the very fine grunge should be placed in a small tray or plastic box cover and sorted with fine tweezers under a binocular microscope with good lighting.

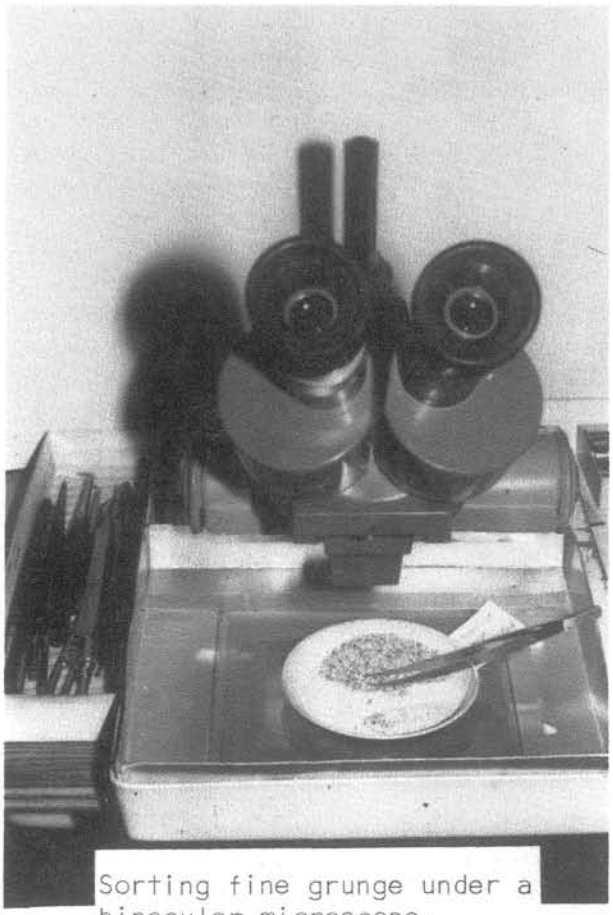
Tweezers for working with minute shells should not be too stiff or broad-pointed. Ordinary stamp tongs are usually too broad in the points for the very small shells,but may help in handling the highly polished rounded shells such as Marginellas. Slender pointed tweezers such as jewelers or electronic workers use are very good, but try to find at least one pair of very flexible fine-pointed tweezers for the very tiniest shells, which will crush with anything stiffer. Another useful tool for handling tiny shells is a very fine artist's paint brush. When moistened, this will be very useful in picking up these tiny shells. A larger artist's paint brush with stiffer hairs is helpful in cleaning tiny shells under the magnifying glass or microscope. Some type of very slender pick is also helpful in removing foreign deposits on the little shells. A piece of very fine spring wire, or a very thin cactus thorn, inserted into a slender handle will also be useful in cleaning out the apertures of small shells.

Brushes, picks and tweezers for handling and cleaning minute shells.

I usually put the shells in a mild bleach solution for a few minutes, then rinse them in clear water and dry them. To bring out the color better, they can be dampened with alcohol, in which a small amount of mineral oil has been dissolved, or with benzine containing a small solution of clear petroleum jelly. If the shells appear too oily after this treatment, brushing with pure alcohol or benzine will remove such excessive oiliness. Never use any acid or strong bleach on minute shells as they can be ruined in a fraction of a second by such strong chemicals. Many times the tiny shells can be cleaned quite well with nothing more than clear water and a small rather stiff brush, holding the shell with tweezers. I do this work under my microscope so that I can clearly see what I am doing.

For studying the smallest shells, a microscope with 10 to 40 power eyepieces. is very desirable -- indeed, almost a requirement. Many times the identifying features of the shell can only be seen in this way. Many species of minute shells have not been figured well enough to be of much help,and some have not been figured at all, so it is necessary to be able to interpret written descriptions to determine what species your tiny shell belongs to. Most of these descriptions were written by the author while he was looking at the shell under a microscope. Microscopic spiral grooves or rows of pits on the nucleus or between the coarser sculpture often are the

main basis for separating different species. So the use of the microscope becomes vital in minute shell study, and a binocular microscope with good lighting will be well worth the small extra cost over a single eyepiece type



Sorting fine grunge under a binocular microscope.

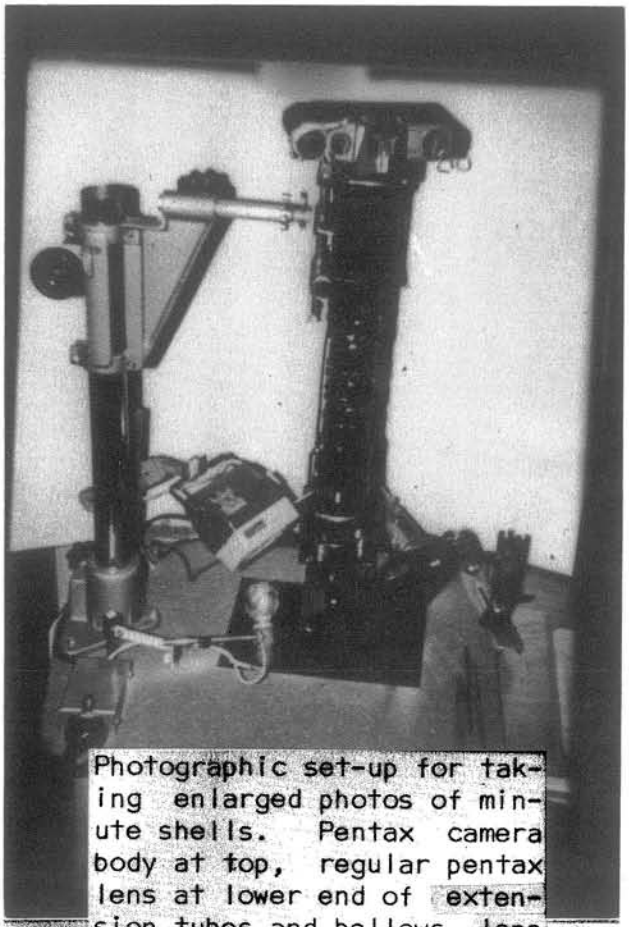
In studying minute shells to learn how to identify the various kinds that have been picked out of the grunge, it is best to try first to learn the characteristics of the families and genera which include minute mollusks. Several books for this purpose are available. Dr. James McLean's MARINE SHELLS OF SOUTHERN CALIFORNIA, published by the Los Angeles County Museum is one of the best for California shells. Dr. Myra Keen's SEASHELLS OF TROPICAL WEST AMERICA will be very helpful for families and genera of the Panamic province. Other useful books are: Tucker Abbott's AMERICAN SEASHELLS; THE FIELD GUIDE TO SHELLS OF THE PACIFIC COAST AND HAWAII by Percy Morris; and MARINE SHELLS OF THE PACIFIC NORTHWEST by Tom Rice. Out-of-print books that can help in this work are: Ida Oldroyd's MARINE SHELLS OF THE WEST COAST OF NORTH AMERICA; Josiah Keep's WEST COAST SHELLS; and Grant and Gale's CATALOGUE OF THE PLIOCENE AND PLEISTOCENE MOLLUSCA OF CALIFORNIA. Two other valuable books for minute shell identification are: MARINE MOLLUSCAN GENERA OF WESTERN NORTH AMERICA by A. Myra Keen, and MARINE MOLLUSCA DESCRIBED BY P.P. CARPENTER by Katherine Palmer.

However, even if one has all of these books, many species will be collected which are not mentioned in any of them, or which do not match the descriptions given, either because the description is inadequate, or the original author had specimens that were not good enough to permit an adequate description or figure. Also in many cases the earlier authors could provide only drawings of the shells for their figures, since equipment was not yet available for proper microphotography; and not all the authors were able to make drawings that perfectly illustrated what the tiny shells looked like -- in fact, some left much to be desired.

The use of photography to take enlarged pictures, especially in color, of the minute mollusks and of their shells is just getting well started Of course the high cost of printing color photos will result in mostly black and white figures in future publications, but these will be clearer and better than most of the older figures.

To take enlarged photographs of shells, either in black and white or in color,requires special camera equipment of one sort or another. One method is to take the photos with an ordinary camera set up as close as the camera will permit, and then to enlarge the resultant pictures. This will usually result in rather grainy pictures and loss of some details. The other method is to use a through-the-lens reflex camera with a removable

lens. Mount the camera on some form of enlarger support and extend the focal length of the lens by an adjustable bellows and extension tubes as needed. Intense lighting is needed and I use two synchronous flash units one on either side of the shell.



Photographic set-up for taking enlarged photos of minute shells. Pentax camera body at top, regular pentax lens at lower end of extension tubes and bellows, lens inverted. Two synchronized flash units and focusing spot lights.

Posing the tiny shells to obtain the exact details wanted is also important. I use a plate glass shelf to hold the shell and raise this shelf about one and a half inches above the background of solid color or black, so as to keep the background completely out of focus. Otherwise the backgound tends to distract attention from the shell which is the true object of the picture. As small a lens opening as possible will give maximum depth of focus, so I use f16 or f22, whichever is available in the lens I am using. Much experimentation is necessary to find the best distance of the flash units from the shell or shells being photographed, and the best positioning of the shell to highlight the sculpture in the manner which best shows the important details. This is a rather tedious procedure, but the results are worth the effort.

In my next article I will discuss and show photos of minute shells of the first few families which include minute species, following Dr. McLean's book for taxonomic order of families.

CLUB NEWS

CLUB CALENDAR

January 19. Regular meeting. Workshop with sections on collecting, cleaning, identification, cataloguing.

February 16. Regular meeting. The film "Santa Barbara -- Everybody's Mistake" will be shown as part of a program emphasizing conservation.

March 16. Regular meeting. Slide program "Intertidal Life", supplemented by slides from the Club's library, will emphasize local shells and their marine neighbors.

The following officers for 1973 were elected at the Society's Annual Business Meeting on October 20, and installed at the Christmas meeting on December 15:

President:
Paul B. Sillars, Goleta
1st. Vice-President:
Frank B. Light, Jr.,Carpinteria
2nd. Vice-President:
Joan Mitchell, Goleta
Recording Secretary:
Jean Fowler, Santa Barbara
Corresponding Secretary:
Gladys Gilkeson, Santa Barbara
Treasurer:
Geri Urban, Santa Paula