THE USE OF MOIST CHAMBERS IN THE CLASSROOM

The moist chamber, in my judgement, just may be the simplest, yet most useful piece of equipment that the elementary or secondary science teacher has available.

You are saying, no doubt, "Two questions, please, before I take issue with that bold, broad statement you have just made." The first question is: What the heck is a moist chamber? The second is: What can one do with a moist chamber, after one finds out what it is, that makes it so useful in the classroom?

Let us turn our attention, then, to the answers to those two questions before arguing about my bold statement as to how useful a moist chamber may be. In fact, let us turn our attention to the answers to those two questions and just forget about my bold statement.

A moist chamber is any container which will hold a high humidity atmosphere within itself for a rather long period of time. It could be the size of a room or it could be a tiny vial, but our interest, obviously, is in those well between such extremes. For classroom use, we want a moist chamber to be small enough so that we can use many of them without getting into a storage, or space, problem. Yet, we want them to be big enough so that they will hold reasonable-sized bits of material. And we want them to be cheap and readily available to us.

A dish, four-to-five inches in diameter and a couple of inches deep, with a cover, would be ideal for most purposes. Petri dishes make fine moist chambers, but one is limited to what one can put into them because of their size. They are ideal because they are generally available in quantities, because they stack easily, because they hold moisture well, and because they are easy to handle. Likewise, those stacking five-to-six inch finger bowls -- the kind where the one becomes the cover for the one below it -- which one often has around make fine moist chambers. Various plastic kitchen containers with tight covers work fine, but they are usually opaque or translucent so that students cannot readily see what is going on inside them. In summary, any dish with a cover so that it will hold its moisture inside can be used as a moist chamber. It is preferable that it be transparent so that material inside may be observed without opening it, but that is not essential. The size depends on what is to be put into it.

So much for the container. What else goes into it to make it a moist chamber? Obviously, we have to put some moisture in -- some water. Before the water is introduced, it is usually a good idea to line the bottom of the container with
something which will absorb and hold the water. Filter paper is ideal. Paper toweling, cut or folded to fit the container, is almost as good. Even newspaper can be used. Now we are ready to introduce the material in which we are actually interested. This may be any sort of organic material one may wish to use.

The purpose of the material placed in the moist chamber is to serve as a substrate on which other things can grow. We are creating, in essence, a small, closed ecosystem in which we can observe, study, and measure a succession of growth. As an example, it is said that the old-time mycologists -- those teaching about the fungi before lab glassware, autoclaves, etc. were readily available -- gave their students a covered glass dish and the instructions to go out and collect a "rather fresh" piece of horse manure. This was put on a piece of paper in the dish and moistened with water. Various molds and other fungi -- even small mushrooms -- would appear after a few days and continue to do so -- in a reasonable succession of organisms -- for the entire semester. There were lots of horses around in those days, remember. It would be a bit more difficult to expect each student to find a big, solid piece of horse manure today. So, what would we be likely to have the students put in the moist chambers today -- or what would we put in ourselves?

One of the best choices would be pieces of bark collected from standing, living trees. In most cases, pieces of bark will sit in Petri dishes. Our moist chamber, then, is a Petri dish with a piece of filter paper in it, two or three pieces of bark placed on the paper, with the entire contents soaked with water. The best way to do that is to pour much water on the bark and paper, let it stand for 24 hours or so, then pour the excess water out. The bark and the paper will be soaked, but there will be no appreciable excess -- it will not be floating. Start looking at the bark after a few days.

What will one find? Mosses and lichens will develop on the bark. Insects and tiny worms will begin to move about. Various types of fungi and bacteria will appear. I have even had tiny mushrooms develop. A hand lens or a dissecting microscope will be helpful -- and should be used for best results -- but much of what is going on in this tiny ecosystem can be seen and followed with the unaided eye as soon as one gets a bit familiar with the system.

Students can do simple experiments with their bark-moist chambers. They can compare the productivity to produce organisms among the bark of different kinds of trees. Some will produce greater quantities; while some will have a greater number of things appear. Pines, for example, tend to be smooth -- thus not providing many crevasses and points
of attachment for as many organisms -- and full of resins, which tend to inhibit the growth of many organisms. The students can compare bark from different levels on the trees, from different sides of trees (Is there really more moss on the north side?), from season to season, from urban vs. rural locations (Does urban pollution have an effect?), and so on.

Bark from living trees may well be a material of choice in moist chambers, but it is far from the only option. Any sort of organic material may be placed in a moist chamber, cultured, and observed. Bits of dead bark and wood, all sorts of plant debris -- leaves, stems, etc., -- insect cadavers, and other bits of animal tissues. And back to the horse manure for a moment.

For years, I have picked up bits of animal dungs -- rabbit pellets, in particular, but all dungs are rich in organic content -- during my meanderings about the world, taken them back to a lab, and put them in moist chambers. The results in terms of the organisms which grow on such materials have been most rewarding. But do not take my word for it. Have your students do a comparison. Have them experiment. They can compare rabbit pellets to gopher dung to sheep droppings to horse manure. Which promotes the most growth of organisms? Which produces what groups of other organisms? Are any of them better than bark? Did those old-time mycology teachers select well when they sent their students out to gather a piece of horse manure? Does this guy Peterson know anything about what he is talking about?

I rest my case. Simple, cheap, readily available containers which can become moist chambers may well be the most useful devices in your classroom. Try it before attempting to refute my original bold, broad statement.

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