Today's scientists, take a less anthropomorphic view than the poets, though one no less awed by the mussel's complexity. If it weren't for human interest in eating them, we would still be in the dark ages of musseldom. Instead, there are entire books and reams of scientific papers devoted to edible mussels, and marine biologists can indeed wax rhapsodic when they describe mussel metamorphosis and settlement as it relates to phytoplankton blooms and eelgrass meadows.

In the process of trying to make the mussel useful to humankind, science uncovers some interesting things that make you wonder if maybe, just maybe, there isn't some sort of intelligence between those glossy black shells. Under that nerdish molluscan exterior is a highly interesting little critter. Take the beard, for instance. This scour pad-like substance, called the byssus (BISS-us), has gotten the scientific community to spend wads of money trying to figure out how it works. More specifically, scientists want to know how the glue that attaches the byssus to solid objects functions underwater. Surgeons would like to use such a glue in dental and eye surgery, and to reattach fine nerves; the U.S. Navy wants to use it to repair ships without the expense of drydocking them. A repeating string of amino acids has been found to be the key, and companies are now trying to manufacture the glue commercially.

In attaching the byssus, which is its set of anchor lines, the mussel does a tricky little thing with its foot. It creates a plunger-like suction that vacuums the water away from the spot where it wants to place the byssus strand, then it deposits a dab of "pre-adhesive" which cures into a fine thread within minutes. By slightly varying the composition of the pre-adhesive, the threads closest to the shell have extra elasticity to absorb shock. The strands are then coated with a protein varnish. Takes some smarts to figure that all out.

Then there's the foot, from whence the byssus comes. Contrary to popular opinion, mussels can skip town on foot. If their neighborhood goes downhill due to changing water quality, they can release their byssus threads and crawl away. However, a mussel striking out alone is asking for trouble. Starfish and green crabs lurk in the shadows, waiting to pick them off. Generally, it is only the young and restless that take a hike; established families aren't too enthused about starting over.

The mantle is the "envelope" that wraps the fleshy part of the mussel. It is responsible for secreting the shell, detecting changes in light and motion, storing excess nutrients, and producing the gametes at spawning time. The oils in a lady mussel's eggs turn the mantle orange, and the mantle of the gents is a creamy white.

The dark sac in the mussel is the "tummy" or digestive gland-an indicator of the rich phytoplankton (single-celled algae) they have imbibed. Occasionally, during a bloom of Mesodinium rubrum, which turns the water red (but is not a poisonous "red tide"), the mussel meats are a reddish color and may have a slight peppery flavor. Indeed, it is known that mussels will have different flavors depending on where they are growing, because of the various types of phytoplankton found in the local waters.

Mussels can exercise some selectivity when it comes to filtering the water for food. Generally, bacteria and organisms smaller than three microns (a micron is /1000 millimeter) are too small to be retained, and particles larger than 200 microns won't pass through the filter. Twenty micron plankton are just right, but if their concentrations are excessive, they could hinder the mussel's ability to process them. A 2 1/2-inch mussel generally filters about l5 gallons of water a day, and in some places where suspended cultivation is being done, one can notice a remarkable clarity in the water immediately downstream from the feeding mussels.

In mussel society, it is polite to eat with mouths open. Rows of cilia on the gills coax the seston, or particulate matter, toward the labial palps and mouth, where the good stuff gets invited in, and the rejected material is pushed out. Some cilia pump the water through the gills, other cilia are the quality control agents, and some transfer the goodies towards the mouth. Enroute the particles are given a final inspection at the labial palps where an arrangement of ciliated grooves and ridges guide the material either to the mouth, or to the hinterland. Excess feed is passed out of the exhalant siphon as "pseudofeces," and these nutrients produced by mussel waste provide a feedback loop to sustain plankton concentrations.

Inside the digestive system, food is directed and redirected, some of it for further processing. Generally, mussels growing in the front rows of the colony-those that face the current-grow the fastest, and bottom cultivators take this into account when planting seed on a lease site.

It might surprise you to know that mussels have little hearts that pump clear blood, and they have a kidney, a stomach, and a mouth, but like the scarecrow, they haven't got a brain. Makes you wonder how they do all the amazing things they do.

Obviously, a brain is unnecessary for reproduction, which mussels do quite well when conditions are right. Following some cue that is not completely understood, the majority of mussels in a bed will spawn simultaneously. When the first guy goes (releasing a spawning pheromone), the rest usually follow, filling the water with orange and white clouds. Gametes meet and make microscopic eggs which, in six to twelve hours, develop swimming cilia and become larvae. Within 24 to 48 hours they are already eating baby phytoplankton and growing the larval shell, at which point they are called veligers because they have swimming organs called velums.

In three to four weeks the infant mussel is a quarter of a millimeter long, and when it develops gills and a foot, it is called a pediveliger. It stops swimming and settles to the bottom of the sea or on a suitable surface. When it finds something it likes, it loses its swimming cilia and stays put. At this stage, it may hide out in eelgrass "meadows" for awhile, or settle on filamentous algae. When it sets out its byssus, it is completing its final metamorphosis, but it is by no means immobile. With the help of a drifting byssus thread, which can be up to 200 times longer than the shell, restless mussel "spat" up to 2 mm long can float on the tide en masse, until they settle (more or less) for good. There is a 90 percent mortality rate for juvenile mussels, and those that survive become sexually mature at one to two years of age. They typically live for l2 or l3 years, though some elders make it to the half-century mark.

The two halves of the shell are opened and closed by the adductor muscles. The shell's exterior is generally very dark blue or black, and when dry or old it flakes off to reveal the bluish or mother-of-pearl prismatic layer underneath. The "tidal" lines on the shell give only a rough indication of age, but are not accurate. Biologists view lateral sections of shell through the microscope to get the true age.

While the composition of mussel beds is about 90 percent mussels, a variety of other species live in and on the colonies. Kelp use the shells as anchors; barnacles settle in, and shrimp and small fish make feeding excursions to and from the beds. Starfish and green crabs make meals of the mussels, and sea cucumbers and other creatures find mussel neighborhoods to their liking.

A quarter of the food mussels eat is living organisms; the rest is detritus-dead organic matter. A liter of sea water contains l0 to 20 million edible tidbits for mussels to graze on.

In all, there are l7 species of edible mussels worldwide, most of them cultivated for human consumption. But for poets and artists, the lowly mussel has a symbolic significance.

Source unknown