Preliminary studies on the effect of extracellular ATP on the uptake and processing of fluorescent compounds by *Trypanosoma cruzi* epimastigotes revealed that the dyes accumulated initially in large intracellular vacuoles. When ATP was removed subsequently from the medium, the dyes were distributed in discrete intracellular organelles resembling reservosomes. The purpose of this report is to describe the effect of extracellular ATP on the uptake and processing of the marker protein, horseradish peroxidase (HRP) by these parasites. Epimastigotes (strain Y) were incubated for 24 h in culture media to which varying concentrations of ATP was added. The parasites were immediately processed for electron microscopy. Other sets of parasites were incubated similarly with the addition of HRP (500 μg/ml), washed, and placed in fresh culture media for an additional 0, 20, and 40 min. As the concentration of ATP was increased, concomitant alterations were observed in the ultrastructure of the parasites. The most obvious change was the formation of large, membrane-bounded HRP^{+VE} vacuoles in the cytosol. After removal from the ATP-enriched culture medium, and a 20-min chase, these HRP^{+VE} vacuoles separated into discrete structures resembling reservosomes. It is hypothesized that extracellular ATP increases the permeability of the cytostomal membrane, allowing HRP to accumulate at a much more rapid rate than normal to result in the formation of these large, pre-reservosomal vacuoles.

On the Occurrence of Endosymbiotic Bacteria in a New Species of Sponge from Hydrocarbon Seep Communities in the Gulf of Mexico. FREDERICK W. HARRISON, STEPHEN L. GARDINER, KLAUS RUETZLER & CHARLES R. FISHER. *Department of Biology, Western Carolina University, Cullowhee, North Carolina, Department of Biology, Bryn Mawr College, Bryn Mawr, Pennsylvania, Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution, Washington, District of Columbia and Department of Biology, The Pennsylvania State University, University Park, Pennsylvania.*

A previously undescribed species of sponge has been discovered in association with hydrocarbon seep communities at a depth of approximately 600 m in the Gulf of Mexico. Individuals usually are attached to tubes of vestimentiferan worms, occasionally in areas where methane is being released actively from the sea floor. The body of each sponge, which may be 10 cm or more in length, is flesh-colored in life and completely encircles the vestimentiferan tube. Skeletal structure and spicular morphology indicate that this new species belongs to the genus *Hymedesmia* in the Demospongiae. Specimens examined by TEM contain numerous endosymbiotic bacteria, especially in the mesohyl. Although choanocytes do not contain bacteria, putative amoeboid cells possess a few bacteria in vacuoles. The bacteria are bacilliform, up to 700 nm in length, and 200 nm in diameter. Bacteria may occupy up to 21% of the volume of the mesohyl (as determined by section), and when viewed in section, display a packing density of up to 8 bacteria/μm^2. Frozen samples of sponge tissue display significant activities of methanol dehydrogenase, an enzyme diagnostic of meth-

ylotrophic bacteria, and low activities of RuBP carboxylase/oxygenase, an enzyme diagnostic of bacterial autotrophy (when found in deep-sea organisms). This is the first known occurrence of a sponge that lives in a hydrocarbon seep community and that possesses endosymbiotic chemoautotrophic and/or methanotrophic bacteria that, presumably, assist in providing the host with organic carbon compounds.

Fluorescence and Electron Microscopy of Body-wall Locomotory Elements in Acoelomate Worms. SETH TYLER & GREGORY S. HYRA. *University of Maine, Orono, Maine.*

Arrangement of muscles in the body wall of acoel turbellarians, visualized by fluorescence microscopy specific for actin, reflects differences in body shape. Elongate worms such as *Paratomella* sp. have musculature dominated by longitudinal fibers with relatively weak circular fibers and few if any fibers running diagonal to the body axis. Globose and "convolute" worms such as otocelids, mecynostomids, and convolutids show a more complex pattern in which muscles longitudinal in the anterior half of the body cross diagonally across the posterior half, and both circular and diagonal fibers are better developed. Differences in locomotory behavior correlate with these arrangements. Lacking any sort of basement membrane in their body wall, acoel turbellarians link epidermis and body-wall muscles through a multitude of fasciae adhaerentes. These junctions act like spot-welds, and by transmission electron microscopy may be seen densely scattered in the layer of musculature between virtually all cell types of the body wall proper—between epidermal cells and circular muscle fibers, epidermal and longitudinal, and epidermal and diagonal as well as among all types of muscle fibers. Tricellular junctions involving three cell types also occur. Immunofluorescence microscopy for cadherins, presumably dominant in these junctions, shows a strongly developed network in the muscle layer. Neither laminin (a component of basement membrane) nor vinculin (a component of membrane-cytoskeleton linkages) could be detected in the acoel body wall by immunofluorescence.

Fine Structure of the Oocytes and Female Reproductive Tissues of *Gordius* sp. (Nematomorpha). DAVID BRUCE CONN. *Department of Biology, The University of the South, Sewanee, Tennessee.*

Horsehair worms (phylum Nematomorpha) are common and widespread animals, but virtually nothing is known about the design of their reproductive systems. Adult females of the genus *Gordius* were collected from a stream in northern New York state and processed for study of their reproductive tissues and gametes using various techniques for light and transmission electron microscopy. The ovarian tissue consisted of large spherical oocytes attached by a complex of intercellular junctions and cell processes to a branching network of somatic oocyte support cells. Each branch of this support cell network terminated in a cluster of 8–100 or more oocytes. Each support cell possessed a