BIODETERIORATION RESEARCH 2: 599-600
Plenum Press, New York, 1989

THE ROLE OF BIODETERIOGENS RELEVANT TO ULTRASTRUCTURE AND INFECTIOUS DISEASES

INTRODUCTION

This section is an initial attempt to introduce, develop, and report on the role of biodeteriogens as causative agents in human diseases. Often we fail to fully expand biodeterioration beyond the traditional aspects of material objects, foods. feeds, medicines, timber, metals, works of art..... Herein are included several papers dealing with parasites. The original environmental biodeteriogens have been expanded to include basic studies that are applicable to human health and control means. The primary tool for discovery is ultrastructural microscopy.

The basis for these parasitological studies relates to the many millions of people in undeveloped countries of the world, who are suffering from acute and chronic infectious diseases. These diseases affect children and adults causing significant morbidity and mortality. The World Health Organization and the United Nations Development Program have a commitment, over the next 20 years, to eradicate what is considered the six most important infections. The parasitic infections include: Malaria, Schistosomiasis, Filariasis, African Trypanosomiasis, and Leishmaniasis. Leprosy, an infection caused by a mycobacterium, is also included.

This group of papers is specifically comprised of studies regarding the parasitic trematode infection, Schistosomiasis, and the cestode infection, cysticercosis. In general, the four papers in this section provide basic scientific data on the overall neurobiology of Schistosoma mansonia miracidia and cercariae, enzyme kinetics and morphology of snail hosts, and the ultrastructural effects of the anthelminthic drug, oltiprax, on the tegument of the larval tapeworm, Cysticercus fasciolaris.

The first paper provides recent data on the fine structure of "putative sensory" structures and organelles of the nervous system of S. mansonia miracidia and cercariae and the presence of possible neurotransmitters in whole mount material. Such information is essential

in providing baseline information which will lead to experiments designed to investigate the possible role(s) of several neurotransmitters and their enzymes. In addition, experiments designed to study neurotransmitter receptors and the use of specific neuroantagonists and agonists can be studied.

The second paper is concerned with changes in the levels of various enzymes in infected verses noninfected snail hosts. Studies of this type are essential to better understand snail host metabolism, snail ecology, susceptibility, defense mechanisms, and new therapeutic approaches for the development of less expensive molluscicides for snail control.

The third paper concerns the surface ultrastructure and morphometry of cilia of several snail hosts and provides information that may aid in better understanding host-location. Finally, the last paper illustrates the effects of oltipraz on the surface ultrastructure of the tegument of C. fasciolaris.

The potential approaches of these studies fall partially into the general realm of biological control, especially if they can be integrated with other biological and environmental methods designed to foster disruption of transmission of the biodeteriogen. Present day focus and dependence on molluscicides with all their attendant costs, inefficiencies, and possible environmental consequences suggest that other ways to abate transmission need to be evolved and soon.

The use of electron microscopy or ultrastructural techniques is a valuable research tool with vast applications and it is indispensable when used in combination with biochemical, biophysical and immunochemical methods to elucidate the structure and function of cellular components.

Betty Ruth Jones, Ph.D.
Moorehouse College
Department of Biology
Atlanta, Georgia