

II. DEVELOPMENTAL ELECTRON OPTICS LABORATORY

Academic and Research Staff

Dr. J.W. Coleman

1. THE AUGER ELECTRON MICROSCOPE

National Institutes of Health (Grant 1 RO1 GM23597)

M.I.T. Sloan Fund for Basic Research

John W. Coleman

During the past year, the Auger Electron Microscope was moved to a new location, which proved to offer a better magnetic environment for the instrument. Optical misalignment of the system, which at present is the main limitation to resolution in the AEM, still remains, however, due to the lack of facility to traverse the optical elements with respect to each other while images are being observed. A complete design change to allow optical alignment in terms of five optical column packages has now been accomplished, and the instrument will be modified accordingly when funds become available (see Alignment Program below).

In fact, five research programs, aimed at calibrating and testing the instrument, have been planned in detail and are being undertaken as follows.

1. Contamination Program. In this program the species and amounts of background gas are characterized and contamination rates are studied.
2. Alignment Program. In this program the optical elements are made alignable during operation, and the energy analyzer is made independently alignable upon the optical system.
3. Auger Emitting Sample Program. In this program simple known systems are studied for both quantitative and qualitative characteristics of the output signal.
4. Sample Support Program. In this program the effect of spectrum supports is studied with respect to the signal-to-noise for a given specimen.
5. Comparative Microscopies Program. In this program well-known and characterized specimens are examined both by AEM and SEM and/or TEM and/or light microscopy.

