Five definitive or putative members of the Potex group of viruses have been examined in the electron microscope. They are Cymbidium Mosaic virus, Nodine virus X, Viola Mottle virus, Barel Cactus virus and Foxtail Mosaic virus. Optical diffraction from the electron micrographs reveals that the particles are all helical with a pitch of 3.4-3.5 nm. All the viruses appear to have approximately the same number of subunits per turn, this number is just less than an integer and the integer is most likely to be 9. The only parameter which varies widely for the different particles is the number of subunits in the true repeat and this does not represent substantial structural difference.

The determination of the number of subunits per turn would be helped by a knowledge of the phase of the reflection on the first layer line in the optical diffraction pattern. The application of a Fast Fourier Transform routine to the data would be helped by a knowledge of the phase of the electron micrographs. The application of these procedures to the data allows the phases of the transforms to be obtained. This process has been applied successfully to particles of DNA-free reconstructed protein subunits and efforts are being made to apply it to the intact virus.

02.5-09 CRYSTALLINE ARRAYS OF LARGE RIBOSOMAL SUB-UNITS FROM E. COli PRODUCED IN VITRO. By Michael W. Clark and James A. Lake. Molecular Biology Institute and Department of Biology, University of California, Los Angeles, California 90024, U.S.A.

In vitro conditions have been determined for obtaining crystalline sheets of large ribosomal subunits from E. coli. These sheets, slightly curved, close on themselves to form large, 1250 A diameter tubes that are approximately 12,000 A long. They are the first arrays of large subunits produced in vitro that are suitable for study by three-dimensional reconstruction (helices of small ribosomal subunits have been previously obtained; see Clark et al., J. Mol. Biol. (1979) 135, 507). Large ribosomal subunits remain in solution for extended periods (up to 5 months) during this procedure and their structural integrity is assessed by sucrose gradients and by electron microscopy is preserved.

Electron micrographs of arrays diffract to 45 A resolution. Optical diffraction of electron micrographs of flattened tubes shows that there are two large subunits per asymmetric unit in a primitive lattice with plane group symmetry p2 (a = 360 ± 20 A, b = 380 ± 20 A, α = 118 ± 5°). This packing can also be referred to a centered lattice (a = 350 ± 20 A, b = 660 ± 20 A) with approximate symmetry cm.

Supported by grants from NIH and NSF to JAL.