Electron microscope studies showed that the brake lining dust consisted mainly of dark masses showing no internal structure and containing no recognizable chrysotile. In most cases the only contaminants within the dust masses were smooth crystalline particles usually about 0.05 of a micron in diameter (Figs. 5 and 6). Since metallic iron was not present in the original dust sample these were probably particles of metallic aluminum added to the original brake lining mixture as an abrasive. Very occasionally dust particles were found that consisted of a lighter and more homogenous material which contained in addition to the crystalline particles already mentioned elongated crystals of apparently normal chrysotile (Fig. 7). This type of dust, however, made up much less than 1% of the total. Small dust particles were phagocytosed in large numbers by single macrophages but as with chrysotile heated to high temperatures normal phagosome vacuoles were not seen even in specimens examined only a few days after dust injection. The phagosome membrane contracted quickly around these smaller dust particles to form phagosome residual bodies, and these often contained some ferruginous granules and membrane debris as well as dust (Fig. 6). The larger dust fragments were sometimes found within small giant cells, but as with heated



FIG. 6. A macrophage from a mouse pleural granuloma 4 wk after the injection of brake lining dust. Dust particles (D) are present, with membrane elements and some fine granular material, in irregular structures that probably represent phagosome residual bodies. × 46,000.