at 800–850°C the dehydroxylated noncrystalline residue is said to recrystallize to give forsterite and silica. The total decomposition corresponds to

$$Mg_6\ Si_4\ O_{10}\ (OH)_8 = 3Mg_2\ SiO_4 + SiO_2 + 4H_2\ O\ .$$

The forsterite persists together with silica up to 1000°C but above this temperature some enstatite is formed

$$3Mg_2\ SiO_4 + SiO_2 = 2Mg_2\ SiO_4 + Mg_2\ Si_2\ O_6\ .$$

Since the highest temperature used in these experiments was 1000°C it was the decomposition of chrysotile to forsterite and silica that formed the basis of the present study. Throughout this paper the dust samples are referred to as heated chrysotile for simplicity. Readers interested in the exact chemistry of any particular sample are referred to the information in this paragraph.

The sample of brake lining dust used in these experiments was supplied by a commercial producer of brake linings and had been taken from the rear brake drums of two of their test vehicles. These cars had been put through a test routine designed to simulate a long period of normal usage. The original brake lining composition was similar to that described by Lynch in 1968 and in addition to chrysotile asbestos and binding resins the linings had contained both chromium oxide and metallic aluminium granules. It would normally be expected that brake lining dust would contain metallic iron from the brake drum, but an X-ray analysis of the dust sample performed by A. L. Rickards failed to detect crystalline iron on this occasion.

With these samples of heated chrysotile and brake lining dusts the following experiments were undertaken. In the first series, in order to confirm the results of Jagatic *et al.* (1967), doses of 250 mg of chrysotile heated to 1000°C were injected into the peritoneal cavities of 25 Balb/C mice. In the second series of experiments single 10 mg doses of normal chrysotile and chrysotile heated to either 400°C, 600°C, 800°C, or 1000°C were injected into the pleural cavities of similar mice. Batches of 25 mice were used for each dust sample and both sieved and unsieved dust specimens were used in each case. In the final series of experiments single doses of 10 mg of automobile brake lining dust were injected into the pleural cavities of another batch of 25 Balb/C mice. In all cases the dust samples were suspended in 1 ml of sterile distilled water before injection. Animals from all these studies were killed at intervals from 7 days to 1 yr after injection and samples of tissue from each were fixed in either formol saline for light microscopy examination or buffered osmium tetroxide for electron microscopy. For light microscopy, sections were stained with either hematoxylin and eosin, E.P.S., or Perls' stain for iron. For electron microscopy, the tissues were embedded in araldite and after sectioning were stained with lead citrate.

OBSERVATIONS

In the first series of experiments those animals given an intraabdominal injection of 250 mg of chrysotile heated to 1000°C showed signs of toxic effects within 24 hr and by 48 hr seven had died. The remainder showed continuing signs of disability for several days but all eventually recovered and none died within 6 mo of dust injection. When those mice that had died within 48 hr of injection were