intense is the tissue reaction and that particles larger than 3 microns in diameter cause little reaction. In the case of asbestos, however, the reverse is true and apparently only long fibers have any specific effect, as was suggested by the inhalation experiments. This is confirmed by the data of table 16, in which a series of tests with fibrous minerals is reported. When the injected dust consisted of fibers 20 to 50 microns long, all the fibrous minerals tested except anthophyllite, as noted in the preceding section, produced fibrosis; when the material was prepared by first grinding the fibrous dust until the length of fibers was reduced to 20 microns and less or, in some cases, to 3 microns and less, none of the injected dusts caused fibrosis.

These results differ from those of King, Clegg and Rae,[11] who reported the production of reticulosis comparable to the experimental silicotic nodule in rabbits receiving monthly intratracheal injections of 100 mg. of Rhodesian asbestos fibers, 15 microns long, and the production of diffuse interstitial fibrosis in rabbits receiving similar injections of short fibers, 2.5 microns in length. We believe this dose, especially in the long term rabbits, is highly excessive. In our experiments the dosage was kept low in order to minimize untoward reactions which might obscure the peribronchiolar type of fibrosis which characterizes early human asbestosis.

Experiments Using Intravenous Technic

The experiments summarized in table 17, in which the intravenous method of injection was employed, show that the asbestos minerals are far different from quartz in their action on tissue. It has been repeatedly demonstrated that intravenous injection of quartz particles 3 microns and less in diameter will cause a typical tissue reaction with the development of hyalinized fibrotic lesions in extrapulmonary sites, such as the liver and the spleen. Asbestos minerals, however, on intravenous injection generally produce only an inert type of reaction, as is revealed by the results given in the table. The reason for the early deaths in the experiment with chrysotile particles is not clear.

Experiments Using Intraperitoneal Technic

The results of injection experiments with the intraperitoneal technic are given in table 18. It will be noted that the long fiber dusts produced a fibrous reaction while dusts composed of particles 3 microns and less in size caused only an inert type of response. These experiments indicate also that the fibrosis initiated by the irritation of asbestos fibers is not restricted to the lungs, as was formerly assumed, but can be produced in the peritoneum as well.

OTHER EXPERIMENTS WITH ASBESTOS MINERALS

A number of additional experiments were conducted to throw more light on specific phases of the asbestosis problem.

11. King, E. J.; Clegg, J. W., and Rae, V. M.: Effect of Asbestos, and of Asbestos and Aluminum, on Lungs of Rabbits, Thorax **1**:188, 1946; abstracted, Indust. Hyg. Digest, 1947, vol. 11 (Feb.), no. 234.