content of only 0.90 per cent, caused typical fibrosis like that produced by the asbestos minerals; free silica particles increase in potency as the particle size becomes less, but asbestos fibers shorter than about 10 to 20 microns are relatively innocuous; aluminum hydroxide neutralizes the irritating effect of quartz but not of asbestos; serpentine has the same chemical composition as long fiber chrysotile, but it produced only an inert type of tissue reaction; there is a wide range in the chemical composition of the minerals which do cause asbestosis (table 19). In view of this evidence it seems more likely that asbestosis is caused by an unusual mechanical irritation due to long asbestos fibers, this irritation being related to the peculiar filamented structure of the fiber and the associated flexibility, which are possessed by no other foreign body studied. Thus, ignition of chrysotile fibers changed their structure and made them inert, although the same fibers, before being heated, would have produced fibrosis (table 14). Further support for the theory of mechanical irritation is that asbestosis occurs in an organ of high mobility —the lung—and that a fibrous reaction can be produced by injecting

TABLE 19.—*Analyses of Fibrous Minerals*

Fibrous Minerals	SiO_2 %	Fe_2O_3 %	FeO %	Al_2O_3 %	CaO %	MgO %	Na_2O %	K_2O %	Ignition < 105 C. %	Loss > 105 C. %	Tota %
Amosite.....	46.23	4.06	38.83	1.09	2.01	6.28	0.33	0.20	0.66	5.28	99.97
Amphibole.....	55.04	3.06	.....	1.69	12.22	23.29	0.43	0.12	0.32	3.60	99.77
Anthophyllite.....	59.80	0.57	.....	0.32	0.44	33.37	0.52	0.15	0.27	4.08	99.[illegible]
Brucite.....	0.90	6.78	9.36	0.46	0.04	53.99	0.91	0.16	0.53	28.66	[illegible]
Chrysotile.....	38.56	2.35	.....	0.34	0.03	38.95	0.29	0.08	4.30	14.99	9[illegible]
Crocidolite.....	54.99	16.27	4.29	1.01	0.80	12.25	6.92	0.57	0.02	2.56	99.6[illegible]
Tremolite.....	56.20	7.21	.....	0.56	4.44	20.52	6.78	0.99	0.34	2.78	99.8[illegible]

asbestos fibers into the peritoneum, where there is also a degree of mobility, but not by injecting them into other extrapulmonary organs such as the liver, the spleen and subcutaneous tissue.

COMPLICATIONS

The experimental investigations with asbestos minerals were concerned primarily with the effect of the dust on normal tissue, but some attention was given to other phases, such as susceptibility to infection. The only experiment in which the effect of asbestos dust on a pulmonary infection was studied was the first inhalation experiment, carried on with King's floats dust. It is unfortunate that, owing to the lack of adequate facilities at that time, infection studies could not be made in the other inhalation experiments also.

SUSCEPTIBILITY TO TUBERCULOUS INFECTION

The development of a tuberculous process initiated at the beginning of exposure to dust, and also of a tuberculous infection superimposed on an established asbestosis, was described in preceding sections of this paper. It may be stated that asbestos when classified according to the effect of a dust on tuberculous infection would be placed below an active