PLAINTIFF'S EXHIBIT
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Potential Health Hazards

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Gypsum is defined by the United States Bureau of Standards as a material which contains not less than 64.5%, by weight, of calcium sulphate. There are three types—Rock Gypsum, which contains the highest percentage of calcium sulphate, with calcium oxide, silicious material, and sulphur trioxide, as its principal impurities; Gypsite, which contains a higher percentage of silicious constituents and a correspondingly lower percentage of calcium sulphate; Synthetic Gypsum, which is an industrial by-product principally derived from the fertilizing industry.

Gypsum is harmful to persons engaged in its manipulation in proportion to its content of silica. In one community where gypsum is mined or quarried, under conditions involving no exposure to silica dusts, either in the handling of the overburden or in the gypsum itself, there may be no evidence of any marked toxic action in this industry. In other communities where the silica content of the gypsum is high, or where the overburden of rock or earth is silicious, the gypsum industry may come to be properly regarded as a definite source of a dusty lung disease. For insurance purposes, therefore, this industry should not be considered in its entirety, but every individual mine, quarry or region should be appraised in terms of the silica exposure.

Stycosis: The presence of calcium sulphate in body organs gives rise to the descriptive term "Stycosis." There is little evidence to prompt the belief that pulmonary stycosis is of any importance as an industrial disease. The particles of calcium sulphate are not sharp-edged, but rounded, and they apparently act as a mild stimulant along the respiratory tract, which serves a beneficient action, in that the more inert silica particles, capable of far greater harm, are partly removed from the lung and pulmonary tract. The combination of calcium sulphate with silica dust is far less hazardous than an equivalent exposure to silica dust alone.

In coal mining it frequently becomes necessary to dust the sides and walls of the mine passages for the purpose of lessening the danger of coal dust explosion, and for the further purpose of better illuminating the black coal surfaces. Of all earthly materials usable for this purpose, gypsum appears to be the most desirable, in that it is not known to produce a fibrosis, is white in color, thus bettering illumination, and tends to promote the extrusion of other dusts from the respiratory tract.

While calcium sulphate is believed to be chemically and physically harmless in small quantities, so great an exposure may take place that the respiratory tract may be gorged with this dust. Obviously, under such circumstances, no dust may be regarded as entirely harmless.

Silicosis: Silica bearing material may be associated with gypsum industries as an impurity admixed with the calcium sulphate, as a constituent of the overburden of rock and earth covering the gypsum deposits, and as a direct implanted ingredient in certain gypsum products. Wherever hard silica dusts are frequently present, and workmen are exposed over long periods, such as two or three years, some workmen will develop silicosis. Wherever this hazard is present, careful examinations are likely to reveal a surprisingly high incidence of this pneumonoconiotic disease. This is evidenced by recent examinations of subway construction workers in New York City, where it was observed that 58% of all excavators, blasters and drillers exhibited this disabling disease. The rate of severe silicosis among underground workers was fourfold that for open air workers. The dangers of dusts in the gypsum industries center about silica. Wherever this is present in appreciable quantities and hard forms, all exposed workers should be regarded as less desirable risks than those persons engaged in similar work, where silica content is low or absent.

Sulphur Compounds: Some gypsum deposits contain appreciable quantities of sulphur compounds. In heating operations the sulphur containing gases may be driven off, and these may serve as irritating atmospheric agents. Sulphur dioxide and hydrogen sulphide are known to arise. Toxicity for sulphur dioxide begins at 0.01 parts per thousand of air, and for hydrogen sulphide at 0.1 parts per thousand of air.

Blasting: A variety of dynamites, and other explosives, may be found to be employed in the gypsum industry. The softness of this rock favors the use of low-grade nitroglycerin dynamites. The use of nitro-starch dynamites is said to remove many of the dangers of explosives.

In addition to trauma hazards from explosives, certain occupational disease conditions are well established. "Nitroglycerin head" is common among "powder men." This condition is characterized by intense and excruciating headache, rapid heart, partial or total loss of vision, irritability, loss of appetite. Alcoholism increases the severity of the condition.

Underground Work: Continually increasing, is the evidence that lack of contact with the sun's rays is an undesirable state for all human beings. This factor combined with the usual wetness of gypsum mining, and the excessive air motion demanded in such mines, are all undesirable features of gypsum work, although, perhaps, no more undesirable than in mining work of all sorts. The especially harmful states attributed to excess wetness are:—respiratory tract diseases, neuritis and rheumatic affections.

Heat: In the calcining of gypsum and in other operations heat hazards may be introduced. It is difficult, however, to rate this hazard as it may unfavorably influence longevity, or bring about premature increpitude, degenerative diseases or lowered work capacities. On theoretical grounds, at least, heat — dry or moist — especially when associated with exposure to sudden variations, should provoke in time general increpitude, arthritides, lumbago, renal lesions, anemia, respiratory inflammation, etc.

Stucco Boils (Retarders): Among those persons manipulating stucco, especially in the building trades, and to a lesser degree in the manufacture of stucco, there arises a condition known to the workmen as "stucco boils." This condition probably may be attributed to various substances placed in stucco to bring about a slower rate of setting. Among the substances employed are glue, glycerin, flour, blood, sugar, etc. These organic materials may promote the occurrence of abscesses in the presence of mechanical irritation.

Fillers: Various extraneous materials in addition to retarders may be added to gypsum products, as follows:—ground silica, sisal, asbestos, lime, wood fiber, hair, and a variety of inorganic salts. Among these substances are several that are potentially harmful. The grinding of sand for this purpose, and the preparation of asbestos, are two examples of obvious hazards.

Burrstones: In the gypsum industry many operations call for grinding with burrstones, which material is a hard form of silica. In the course of such operations it frequently becomes necessary to sharpen the cutting surface of these burrstones. This chipping may be done by hand or machine. In either instance silicosis is a considerable hazard, and when machine chipping is utilized teno-synovitis is a possibility.

Teno-Synovitis: Air-drills and related vibrating machines are common to the gypsum industry. Among those persons engaged in drilling operations, inflammation of synovial sheaths is prone to arise, especially along the tendon groups of the hands and forearms. This traumatic teno-synovitis is the result of repeated minute traumas, and constitutes a meritorious occupational disease.

Carbon Monoxide: Wherever gas is the heating medium in the heat treatment of gypsum and its products, the potential hazards of carbon monoxide are always present—whether the gas be natural, by-products, producer, or water gas. The characteristics of carbon monoxide poisoning are known.

Goat Hair: In the making of stucco, goat hair is commonly introduced as a binder. For reasons little understood, goats are the common harborers of anthrax bacilli, and contact with goat skins and hair provides the greater number of cases of anthrax. The great resistance of anthrax bacilli and their spores to disinfecting measures makes their eradication most difficult, without harming or destroying animal products such as hair. Wherever possible, the use of goat hair should be obviated, substituting wherever practical, cow hair and other less hazardous substances.

Mechanical Injuries: Mechanical dangers are prone to exist in any industry which originates with blasting operations, and that later entails the underground or quarry handling of heavy stone, with subsequent crushing, heating, grinding, and belt conveying. In addition there exist the potential hazards of explosion, explosion gases, electrical injury, crushing injury from rock and similar mining hazards, mechanical hazards around crushers, screeners, conveyors, etc. Actual experience has shown that all such operations are amenable to safety control. Good accident experience is due not to the absence of hazards, but to highly organized accident control procedure. The definiteness of hazards in this industry is reflected in compensation rates as derived from an averaging of several states. For every $100.00 of payroll, the premium on this average basis is $3.21. For quarrying, the corresponding rate is even higher, being $6.88.