

- 730 Experimental and Clinical Contribution to Human Pathology Due to Sulfuric Acid Fumes. A. Morando. *Med. lavoro* 47, 557-561 (Oct. 1956). Italian.

Normal human subjects, not accustomed to inhaling sulfuric acid fumes, were made to inhale for 5-15 minutes air polluted with sulfuric acid concentrations from 0.35 up to 5 mg. per cu. m. Even at concentrations that are not subjectively detected by the persons under test, the respiratory flow rapidly increases and continues high until some minutes after the end of the test; the increase is more evident at higher concentrations. The increase in respiratory flow involves a reduction of the percentage of the acid retained in the respiratory system, and can be considered as a defense mechanism. Fifty-seven workers in the sulfuric acid production department were also followed up for several years; there was no evidence of a particular increase in the occurrence of bronchial or lung diseases, nor of conjunctival or pharyngeal irritation. Numerous cases of gastritis and gastro-duodenitis, gastric ulcers, and digestive troubles were observed. Chronic exposures to relatively low concentrations of sulfuric acid as those to which the workers under examination were exposed, seem to produce gastro-intestinal tract lesions more easily than respiratory system lesions.

-- Adapted from English summary (Bull. Hyg.)

- 731 Aluminum in the Environment. A Review of Its Hygienic Status. Irene R. Campbell, J. S. Cass, J. Cholak, and R. A. Kehoe. *Arch. Ind. Health* 15, 359-448 (May 1957).

This paper is an exhaustive review of the hygienic aspects of aluminum, based on the study of some 1,500 books, reports, and articles, of which about 500 are cited. The principal subjects discussed include: history of the development and uses of aluminum; chemical and physical properties and analysis; occurrence in the normal environment; aluminum in food; and use in medicine.

The history of aluminum in food begins with the addition of alum to flour to disguise inferior qualities, early in the 19th century in England. That practice was soon forbidden by law. Later the use of alum in baking powder became a subject of controversy. This controversy was settled by a publication of a report in 1914 by a Referee Board established by the U. S. Department of Agriculture, which presented the unanimous opinion of the Board that baking powders containing aluminum are no more harmful than are other baking powders but that it is wise to be moderate in the use of foods that are leavened with baking powder. However, the sale of baking powder containing aluminum is still forbidden in some European countries. Compounds of aluminum are also widely used in the preservation of pickles and fruits and in the manufacture of sugar and beer. Aluminum sulfate is used most extensively in the purification of drinking water supplies, and only traces of aluminum are present in the purified water.

When aluminum cooking utensils were first used, the question of health effects of aluminum in food from that source arose. A number of investigations have shown that the concentrations in foods cooked in aluminum fall well within the ranges found in raw products, except in isolated instances, and even in those cases, they fall short of physiologic significance. Investigations have also shown that the processing and packaging of foods in aluminum does not contribute to the destruction of nutrients over and above that caused by handling of food in the food industry; neither does it bring about any discoloration or change in the flavor of the product. In comparison with other materials designed for the same use the sanitary qualities of aluminum are equal or superior.

In the section on aluminum in the body, it is shown that only small amounts of aluminum in the tissues are produced by ingestion, topical application, and inhalation. Only in the case of injection of massive amounts is the aluminum content of tissues increased materially. Only in industrial experience has there been any basis for the opinion that the aluminum-containing earths or the metal itself may possess properties that may be inherently dangerous to man. Even here, difficulty has been encountered rarely and only under conditions of unusual urgency for production, and these sporadic difficulties, in the form of "Shaver's disease" and the "aluminum lung" have been highly questionable with respect to the role played by aluminum in the mixtures of raw materials and industrial products that are inhaled as dust. Moreover, these industrial hazards have been amenable to control by appropriate measures of industrial hygiene.

The medical uses of aluminum compounds include: use of aluminum hydroxide gel for treatment of peptic ulcers and gastric acidity; counteraction of the toxic effects of fluorides; treatment of dermatitis; removal of bacteria from the skin; other germicidal uses; control of excessive sweating; and prevention and therapy of silicosis.