THE USE AND ABUSE OF DRUGS

1. The Role of Expectorants

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Expectorants as defined by Bastedo (1) are remedies that facilitate the expulsion of mucus from the respiratory organs. Several factors play a role in this process, the ciliated epithelium, the act of coughing and a peristaltic-like movement (2) of the smaller bronchioles.

Of these, the ciliated epithelium is the most important. These specialized cells are found in the trachea, bronchi and in patches even in the terminal bronchioles (3). The contraction of the cilia follow in a definite, orderly manner and are co-ordinated. This increases greatly their effectiveness in performing work. Thus, in spite of their extremely minute size, an area of a square centimeter (2/5 inch by 2/5 inch), according to Howell (4), is capable of moving a load of 336 grams (10.5 oz.). To accomplish this amount of work, it is essential that the cilia move rapidly. Henderson and Taylor (5) have demonstrated that cilia carried mucus at the rate of 5.3 cm. (2.1 inches) per second.

The efficiency of the cilia is increased when the viscosity of the mucus is lessened, and this can be accomplished either by increasing the water content or by "salt action," for example of ammonium chloride, on mucus. Emetics, according to Whitla (6), "cause the tubes to sweat." There is an outpouring of fluid into the bronchial tract, thinning the mucus and lessening its viscosity. Miller (7) has demonstrated that the nausea and vomiting produced by emetics are accompanied by an increase in the rate and depth of respiration. This increased pulmonary ventilation will also favorably assist in the expulsion of mucus. The nauseating, or the so-called stimulating, expectorants include such drugs as antimony, ipecac, apomorphine, squills, senega, sanguinaria, ammonium carbonate. Antimony has the advantage over the others in that it is slowly absorbed and so induces a prolonged nausea of slight degree.

Ammonium chloride and sodium iodide are two drugs that are excreted by the bronchi unchanged, and have a solvent or "salt action" on the mucus. Coleman (8) in the report of his investigation of the clinical value of ammonium chloride as an expectorant, points out that the salty taste of the drug can be recognized in the sputum within one-half to one hour after administration. The ammonia nitrogen was increased, proving that the salty taste was due to the ammonium chloride. The subjective symptoms were relieved, but when the

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