EVALUATING TRICHLOROETHYLENE EXPOSURES BY URINALYSES FOR TRICHLOROACETIC ACID

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SINCE trichloroethylene is widely used as a solvent and the technical measures of precaution adopted are in many cases unsatisfactory, a large number of employed persons are exposed in their daily work to the inhalation of trichloroethylene fumes. This circumstance, among others, has motivated an investigation of a method for the estimation of the degree of industrial trichloroethylene exposure. Further, by correlating the symptoms of the workers with the degree of exposure one should be better equipped for the prophylactic work. Experience shows that not until a certain, easily determined tolerable degree of exposure has been established can one expect the full effect of one's prophylactic work.

For the purpose here in view the substance that would be the most suitable to determine by analysis might a priori appear to be the active agent itself, trichloroethylene. There are several objections to its use, chief of which is that the exposed persons must be examined within a few hours after the last exposure.

This circumstance implies decided disadvantages for estimating the degrees of exposure of a large number of persons by analyzing exhaled air for trichloroethylene. Such an examination would also be unsuitable for what one might call hygienic and medical field-work.

We have therefore chosen a product of the metabolism of trichloroethylene, trichloroacetic acid, the excretion of which is less dependent on recency of trichloroethylene exposure or minor daily variations of exposure, and since the urinary content of this product remains for some time at a measurable level, we thought it would give a better picture of the average exposure over a long period.

THE RENAL EXCRETION OF TRICHLOROACETIC ACID

Barrett and Johnston [1] first showed that dogs excreted trichloroacetic acid after the administration of trichloroethylene. These results, which were extended by Barrett, Cunningham and Johnston,[2] have been verified in further investigations on

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2. Barrett, H. M.; Cunningham, J. G., and Johnston, J. H.: A Study of the Fate in the Organism of Some Chlorinated Hydrocarbons, J. Indust. Toxicol. **21**:479, 1939.