TABLE 38-A

EXCRETORY AND BIOLOGIC THRESHOLD LIMITS

Urinary TLV's should be used for		
Aniline	Hydrogen cyanide	Selenium
Antimony	Hydrogen fluoride	Selenium hexafluoride
Arsenic	Hydrogen selenide	Stibine
Arsine	Lead arsenate	Sulfuryl fluoride
Benzene	Mercury	Tellunum
Boron trifluoride	Molybdenum	Tellurium hexafluoride
Calcium arsenate	Nickel	Thallium
Chlorinated benzenes	Nickel carbonyl	Uranium
Cyanide	Nitrobenzene	Zinc chloride
Fluoride	Nitrogen trifluoride	Zinc oxide
Hydrogen bromide	Parathion	
Blood TLV's are more applicable than excretory limits		
Cadmium dust	Lead	Methyl bromide
Cadmium fume	Manganese	
Blood and/or breath TLV's should be applicable		
Carbon monoxide	Nitric oxide	Sulfur hexafluoride
Breath analysis good for many		
Alcohols	Aliphatic hydrocarbons	Ketones
	Chlorohydrocarbons	

NOTE. Analysis of blood, breath, or urine samples can be done in conjunction with air analysis to determine if workers are in danger of injury or intoxication Ideally, such biologic or excretory threshold limits should correspond to the average levels found when workers are exposed to the atmospheric TLV

Adapted from "Excretory and Biologic Threshold Limits," by H B Elkins A I H A Journal, *28(4) 305–314 (July–August 1967)*

like amount entered the body by any other channel of absorption, such as through the skin or the intestinal wall

The harmful effects of deleterious materials are determined by the amount accumulated in the body—by the total dosage The number of milligrams of harmful material per kilogram of body weight determines the toxic effect produced This is often overlooked when expressing individual exposures only in terms of concentration (parts per million) in the air breathed and the length of time of exposure The amount in the inspired air is not necessarily the amount absorbed

According to H B Elkins (see References), differences in particle size or solubility, which are practically impossible to measure accurately, determine the fraction of inhaled impurity which is retained or absorbed The concentration in the air of parathion, or lead dust, may not be associated with intoxication, depending on whether or not there is opportunity for significant skin absorption or ingestion

These are situations where air analyses are not adequate to precisely evaluate the peril of the hazard, since the amount absorbed cannot be predicted from the data obtained by such determinations In such situations it is highly desirable to have other means of estimating exposure With many substances this can be done by analyzing suitable biologic specimens or excretion products for the toxic agent or a metabolite derived therefrom (See Fig 38–1)

The only biologic fluid finding much appli-