and mild chloride supplementation (2 to 4 Gm NaCl three times daily), symptoms subside readily and tremendous doses of sodium or ammonium chloride seem worthwhile only in extreme cases. The administration of mercurial diuretics hastens elimination of the drug by promoting a bromide as well as chloride diuresis. Hemodialysis with the artificial kidney hastens the excretion of the poison and is probably advisable in severe cases.

Caffeine. Although human fatalities due to caffeine are rare, overdosage leads to insomnia, mild delirium, tinnitus, tachycardia, and prominent diuresis. Because caffeine has a direct effect upon the myocardium, it may cause serious arrhythmias, and dosage should be limited to 6 Gm daily. A cup of coffee contains 100 to 150 mg of caffeine. The excitatory effects are easily controlled with barbiturates.

Camphor (Camphorated Oil). Formerly a popular stimulant, this drug is now rarely used therapeutically; however, occasional cases of poisoning are still seen as a result of ingestion of liniment or moth flakes. Manifestations are headache, sensation of warmth, confusion, clonic convulsions, and terminal respiratory depression. The characteristic odor of camphor facilitates the diagnosis. Treatment is supportive. Barbiturates should be used with caution in combating convulsions because of postictal respiratory depression. Camphor is closely related to thujone, formerly the active principle of absinthe, which was probably responsible for convulsions in absinthe addicts.

Cantharides (Spanish Flies, Blistering Beetles, Essence of Viper). Poisoning may follow accidental ingestion but is probably commonest after taking cantharides powder for abortion or as an aphrodisiac, often as a prank. It is a potent irritant and vesicant. Symptoms are severe burning pain in the mouth, esophagus, and abdomen, intense thirst, bloody diarrhea, and hematemesis. The vomitus contains shining particles if the powder has been taken. There is rapid onset of acute urethritis with painful micturition, priapism, oliguria, hematuria, anuria with uremia, hepatic failure, myocarditis, delirium, and death. Treatment consists of gastric lavage, avoidance of oils or fats (the active principle is fat-soluble), morphine for pain and tenesmus, and blood and fluid replacement. With anuria, which is due to glomerular and tubular damage, a regimen for acute renal failure (p. 1496) has been followed by recovery.

Carbon Monoxide. Carbon monoxide is a colorless, odorless gas formed by incomplete combustion of carbon-containing materials. It is a component of manufactured illuminating gas and automobile exhaust fumes. The effects of carbon monoxide arise from its ability to form a stable compound with hemoglobin (carboxyhemoglobin), reducing the oxygen-carrying capacity of the blood. Symptoms include decreased exercise tolerance, headache, irritability, reduced judgment and memory, confusion, collapse, and unconsciousness. The symptoms may all appear within a few minutes or may develop gradually if exposure is minimal but prolonged. Carboxyhemoglobin is bright red, and patients show a characteristic cherry-colored flush. Cyanosis is absent. Treatment is directed toward the breakdown of carboxyhemoglobin by adequate ventilation in the presence of high oxygen tension. The patient should therefore be removed from exposure immediately, and oxygen inhalation should be instituted. Recovery is usually rapid; but if tissue anoxia has been prolonged, irreversible nervous system damage may have occurred. A hemoglobin solution produced by diluting blood 1:20 with distilled water will turn brown upon the addition of an equal volume of 40 per cent sodium hydroxide, whereas a carboxyhemoglobin solution remains red.

Carbon Tetrachloride (and Other Halogenated Hydrocarbons). Halogenated hydrocarbons are widely used as industrial solvents. Inhaled in sufficient concentration, all are capable of inducing narcosis and in addition have varying amounts of hepatic and renal toxicity. Household exposure to carbon tetrachloride may occur through the use of "safe" (nonflammable) cleaning solvents or fire extinguishers. Absorption may occur following inhalation of fumes in a closed space, percutaneous absorption, or ingestion. Renal involvement is said to be more common after inhalation than after ingestion, which leads to absorption by the portal venous system. The toxic effects of this solvent are greatly enhanced in alcoholics. Manifestations are abdominal pain, nausea, vomiting, diarrhea, and headache within a few minutes, followed in hours or days by progressive damage to liver or kidneys or both. The renal lesion can progress to complete anuria; with proper fluid management and possibly the use of the artificial kidney, survival is possible despite this complication. Hepatic damage may be acutely progressive, with severe jaundice and rapid death. The hepatic lesion is a severe central necrosis. Death secondary to pulmonary edema, common in the past, was due to excessive fluid intake in anuric patients rather than any toxic action on the myocardium. Spraying carbon tetrachloride on an open flame results in the production of phosgene, an even more toxic substance which produces pulmonary edema. There is no specific therapy other than gastric lavage and stimulants. Management of the renal lesion (p. 1496) and a regimen designed to minimize the hepatic damage are indicated.