

irritating. After a year he had nausea, vomiting and vague abdominal pains, and always felt tired. On examination, his liver was felt well below the costal margin, and there was diffuse abdominal tenderness. The mucous membranes were subicteric, and there was a bluish line on the gums with some pyorrhea. The urine was normal. Detailed laboratory findings at this time appear in table 11.

This man was removed from the hazard and had dental care. At the end of five months his gums were clear, he had no abdominal tenderness and said he felt well. His blood count and urine were normal (table 12).

This case is interesting in that clinically the liver appeared to be the organ particularly involved and this was confirmed by blood-chemical determinations. There was also a considerable degree of anemia without signs of renal damage.

Liver	{	palpable liver
		high serum globulin
		low serum albumin
Bone marrow: anemia		

COMMENT

The five patients presented had all been exposed to small amounts of cadmium—either dust or fumes—for considerable periods. Patients 3, 4 and 5 had mixed exposures, patients 3 and 4 having been exposed simultaneously to lead. Lead was quantitated in the blood and urine of these patients. In general, it is believed that metals which would complicate the clinical and laboratory findings, such as mercury or arsenic, were not present in this series. In lead absorption, as previous work¹ indicated, no significant changes occur in the blood chemistry. So it is believed that the findings in this series may properly be attributed to the cadmium which was shown to be present in blood and urine in all cases.

An opportunity was afforded to follow these patients both clinically and by laboratory studies, and all recovered completely in about six months after exposure had ceased. It is interesting that the classic picture of cadmium poisoning with its acute pulmonary disease was apparently absent in this series, except in case 4, in which characteristic pulmonary signs and symptoms were associated with frank jaundice. Even in case 1, in which the cadmium exposure was apparently sufficient to cause unconsciousness, no pulmonary evidence of cadmium intoxication developed.

In all these cases, cadmium was found in both blood and urine and quantitated. It disappeared with recovery of the patient. The blood chemistry of each patient was studied at the onset of the intoxication and again several months later. Hematological studies were also made in all cases. The results of all of this laboratory work are presented in detail. Damage of liver and bone marrow was evidenced by changes in blood chemistry in all five cases. Renal damage was found in cases 2, 3 and 4.

The present series of patients showed no evidence of hypocalcemia. In fact patients 1 and 2 showed elevations of blood calcium. Blood calcium studies were carefully followed because of the reports that in France battery workers showed calcium deficiencies in addition to cadmium poisoning. It is possible that the diet of the general population of the region was deficient in calcium after the war and that this accounted for the hypocalcemia which was found.

In the entire field of occupational medicine the diagnosis of acute intoxication is relatively simple, because patients with acute intoxication tend to be hospitalized. They can thus be carefully studied, and opportunities may be afforded for pathologi-