that an increase in the amount of potassium is a factor in shock. The blood potassium level tends to vary directly with the degree of hydration of the blood. There were no significant changes in the Na, Ca, or blood sugar levels, produced by this condition.

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Toxic Substance in Extracts of Postpartum Rabbit Uterus.*

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(Introduced by B. M. Allen.)
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In a previous communication it was demonstrated that saline extracts of postpartum rabbit uterus were highly toxic after intravenous injection in the same species.[1] Death occurred with the characteristic symptoms of histamine shock and the activity of the extracts was destroyed by the enzyme histaminase.[2] It was tentatively concluded that the active material was histamine or a histamine-like substance.

In order to determine whether the effects of this "histamine-like substance" on the guinea pig ileum were identical with those of histamine, uterine extracts were subjected to acid hydrolysis, the hydrolysates neutralized and assayed on an isolated strip of guinea pig ileum, according to the method of Barsoum and Gaddum, and the responses compared to those of histamine.[3]

Extracts so treated assayed between 2.2 and 3.2 γ histamine per cc. This is approximately the histamine content of normal rabbit tissues, and would be by no means sufficient to cause death in the amounts injected.[4] It was possible, moreover, to recover between 70 and 80% of histamine dichloride added to saline extracts of rabbit uterus and of various guinea pig tissues in quantities between 10 and 60 γ per cc and treated in the same manner (Table I). The failure to recover toxic quantities of histamine from uterine extracts led to the conclusion that some substance other than histamine is responsible for the toxic activity of the extracts.

It was considered possible that the active substance was protein-

* Aided by a research grant from the University of California.

1 Krichesky, B., and Pollock, W., *Science*, 1940, **91**, 410.

2 Krichesky, B., and Pollock, W., *Am. J. Physiol.*, 1940, in press.

3 Barsoum, G. E., and Gaddum, J. H., *J. Physiol.*, 1935, **85**, 1.

4 Best, C. H., and McHenry, E. A., *Physiol. Rev.*, 1931, **11**, 371.

TABLE I.
Assay of Histamine Containing Tissue Extracts.

Solution assayed	Amt histamine added per cc, γ	Amt histamine† per cc (assay) γ	% Recovery*
Guinea pig extract	25	19	76
Same	25	19.5	78
Guinea pig heart and kidney extract	16.5	12.0	72
Same	16.5	12.5	75
Postpartum rabbit uterus extract, 1.0 cc toxic	25	19	76
Postpartum uterine extract, 1.0 cc toxic	10	9.2	92
Same	60	50	83
Same	0.0	2.5	—
Same but 1.6 cc toxic	0.0	2.2	—
Same	0.0	3.2	—

†Calculated by comparison of height of contraction with histamine standards. Doses assayed were usually equivalent to about .2 γ of histamine.

*These percentage recoveries are given in terms of added histamine. The recovery figures for rabbit uterus extract which contains small amounts of native histamine are consequently somewhat too high.

like in nature. Filtrates of 4 toxic extracts through a medium Berkefeld filter were no longer active. Treatment of 2 toxic extracts with N and N/20 NaOH in the cold resulted in complete loss of toxicity. N HCl was found to have the same effect. Heating at 80° C for 5 minutes in order to denature the proteins in the extract was found to reduce the toxicity of the extract 2 to 5 times, but failed to destroy it. These heated extracts, however, contained abundant precipitates of protein which may have caused death by embolism. It was impossible to bring this precipitated material into solution by changing the pH as both acid and alkali had been shown (vide supra) to destroy the activity. Two extracts incubated for 24 hours with pancreatin were also toxic though in doses 5 and 6 times as large as untreated extracts. However, a control solution incubated with a pancreatin solution which had been boiled previously to destroy its enzyme activity was also found to be one fifth as toxic as untreated extracts. Consequently, the loss of toxicity cannot be attributed to enzyme action.

Summary and Conclusions. The reactions of the guinea pig ileum to the toxic substance indicate that the latter is not histamine. It is, however, inactivated by histaminase suggesting that histaminase is not specific for histamine but may attack other substances.[2] Zeller has shown that histaminase is capable of hydrolyzing several diamine compounds other than histamine.[5]

The toxic substance is destroyed by mild treatment with acid or alkali. However, heating at temperatures sufficient to denature pro-

[5] Zellers, E. A., *Helvetia Chimica Acta*, 1939, **22**, 1381.

teins present failed to effect complete destruction of the toxicity. Treatment of the extract with both boiled and unboiled solutions of pancreatin discloses no destruction of the toxic substance by enzyme action.

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Modified Method for Determination of Certain Organic Iodine Compounds, Inorganic Iodide in Plasma and Urine.*

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A method for the determination of diodrast and inorganic iodide iodine in blood and urine was presented previously.[1] The principles involved were acid permanganate digestion of the sample with oxidation of iodine to iodate, nitrite reduction of the permanganate, destruction of excess nitrite with urea, and titration of the iodate with thiosulphate in an excess of potassium iodide. This procedure could be carried out either by hand heating of the individual tubes over a micro burner or by heating a number of tubes in a boiling water bath. The digestion of individual samples by hand yields accurate results but requires the constant attention of the analyst. The water bath digestion, however, involves some error, particularly in the digestion of plasma filtrates at high iodine levels, and it is sometimes more difficult to remove all of the permanganate because some manganese dioxide adheres firmly to the walls of the tubes. It is shown here that with an alkaline permanganate digestion these difficulties with the water bath heating are eliminated.

With an alkaline digestion more permanganate must be used, and a longer heating period allowed than with the acid digestion. In order to keep down the volume of the digest at time of nitrite treatment and at subsequent titration, preliminary evaporation of filtrate samples is carried out.

Procedure. Reagents: 13% trichloracetic acid (A.R.), 72% sodium hydroxide (A.R.), approximately 0.4 M potassium permanganate, 4 N sulfuric acid, 1.0 M sodium nitrite, 5 M urea, granulated potassium iodide, 1% starch, 0.0005 N sodium thiosulfate or 0.0025 N sodium thiosulfate.

* Aided by a grant from the Commonwealth Fund.

1 White, H. L., and Rolf, D., PROC. SOC. EXP. BIOL. AND MED., 1940, **43**, 1.