time of extraction from 10 to 20 min. On the other hand, there seems to be an actual loss in total extract, as shown in the lower half of Table 2, when the time is greatly

TABLE 1

LIPID EXTRACTS FROM DIFFERENT TISSUES OF STARVING *Fundulus heteroclitus* AND *Tautoga onitis*

Tissue	Extraction time (min)	Wet wt. of tissue (mg)	Wt. of extract (mg)	%	Average %	Deviation from average (%)
Brain, *F. heteroclitus*	20	54.1	6.3	11.6	12.6	−1.0
	15	42.8	5.3	12.4		−0.2
	10	29.5	3.8	12.9		+0.3
	5	40.7	5.5	13.5		+0.9
Liver *F. heteroclitus*	20	83.4	13.1	15.7	16.4	−0.7
	15	75.3	12.2	16.2		−0.2
	10	55.3	8.9	16.1		−0.3
	10	46.9	7.7	16.4		0
	5	57.5	10.0	17.4		+1.0
Muscle, *F. heteroclitus*	20	246.6	6.7	2.7	2.8	−0.1
	15	149.5	4.7	3.1		+0.3
	10	173.9	5.1	2.9		+0.1
	5	260.8	6.8	2.6		−0.2
Liver, *Tautoga onitis*	20	130.6	7.3	5.6	5.55	+0.05
	15	92.8	5.0	5.4		−0.15
	10	74.5	4.5	6.0		+0.45
	5	97.7	5.1	5.2		−0.35

prolonged. This loss is probably due to the removal of volatile fatty acids during prolonged boiling. Extraction made for 10 min with this apparatus gives very consistent results, as shown in the upper half of Table 2, where the deviation in the four samples is not more than 0.3% from

TABLE 2

LIPID EXTRACTS FROM FISH LIVER

Tissue	Extraction time (min)	Wet wt. of tissue	Wt. of extract	%	Dev.
Tautog liver	10	275.1	30	10.9	+0.1
	10	238.3	25.8	10.8	0
	10	282.1	29.6	10.5	−0.3
	10	276.9	30	10.8	0
			Average	10.8	
Fundulus liver	10	34.5	7.6	22	
	20	39.0	7.4	19	
	40	46.3	8.5	18.3	
	80	37.9	6.0	16	

the mean value. For comparison, a piece of the liver from the same tautog was subjected to the classical method of Soxhlet extraction, and the following results were obtained:

Time of extraction in hours	1	2	3	4	5	6
Lipids recovered (%)	4.9	8.0	8.5	9.1	9.5	10.5

Compared with these data from Soxhlet extraction, the results obtained with the present apparatus show that the amount of lipid extracted is not less than the older method, but the saving of time and solvent is obvious.

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Use of the Freezing-Drying Technique for Study of Vasomotor Activity

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The freezing-drying technique has been adequately discussed by Simpson (*2*) and by Flosdorf and his collaborators (*1*), but it has not been used for preservation of vasomotor pictures in histological preparations. Direct microscopic observation of the smallest arteries and arterioles responding to stimulation was found possible by utilization of the method following intravenous administration of autonomic drugs with resultant vasomotor responses.

In these preliminary experiments 22 white rats under Nembutal anesthesia were used. The abdomen of each animal was opened sufficiently to allow extraction of a loop of duodenum. Following drug administration, a duodenal loop was immersed directly in a small Dewar flask filled with a mixture of dry ice and acetone at a temperature of −70° to −78° C. This rapidly froze the gut and preserved the vasomotor picture. While still frozen, a small piece of duodenum was cut off and placed in a test tube previously cooled in a freezing bath of dry ice and acetone. The test tube, still immersed in the freezing bath, was attached to a "Duo-Seal" vacuum pump and the tissue fixed by freezing and drying. Sections were cut in paraffin at 10 μ and stained with toluidine blue and eosin.

In small pieces of duodenum frozen after injection of atropine sulphate (1 cc of a 1: 1,000 solution) into the femoral vein, the arteries in the subserosa and the arterioles in the submucosa of the gut were constricted. The capillary beds in the villi contained a small amount of blood. Following administration of ergotoxine phosphate (0.5 cc of a 1: 1,000 solution), the arteries and arterioles were dilated, and the capillary beds in the villi were engorged with blood.

Quick freezing of blood vessels and fixation by freezing and drying preserves physiological pictures in histological preparations and is suggested as a method for use in studies of vasomotor activity and similar histophysiologic phenomena.

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