Daily addition of from 10 to 20 mg of choline or of 1 g of yeast or, better, of both, neutralized more or less completely the effect of cystine on the liver. The greater benefit achieved by choline in the presence of cystine over that seen in rats fed choline without additional cystine may be explained by the conception that choline acts through the intermediary of cystine.

The pathogenesis of dietary liver injury (necrosis, cirrhosis) presented here is closely connected with the lipotropic effect[4] of casein and with fat infiltration of the liver which has been considered a prerequisite of cirrhosis.[7]

The results presented here are based on experiments made on a total of 264 rats. The work is being continued.

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Effect of Parenteral Administration of Vitamin B_1 and Vitamin B_6 on a Coccidium Infection.*

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In a paper now in press[1] it has been shown that the addition of both vitamins B_1 and B_6 to a special ration generally brought about a very striking reduction in the number of oöcysts produced in rats infected with standardized doses of the coccidium *Eimeria nieschulzi*. Since vitamin B_1 supplement alone only somewhat reduced the number of oöcysts eliminated and vitamin B_6 supplement increased the counts, the striking reduction brought about by combination of the two was entirely unexpected. In order to determine whether the synergistic action of the vitamins was dependent upon their admission to the site of the infection through the intestinal route, a series of tests has been carried out in which the two vitamins were administered intraperitoneally in normal saline solution instead of being mixed with the ration. Otherwise the procedure and technics were in general the same as previously described.[1]

The animals in lots 1 and 2 averaged about 70 g when started on the rations; those in lot 2, 120 g; lot 3, 90 g. The test and the reference

[7] Connor, C. L., *Am. J. Path.*, 1938, **14**, 347; *J. A. M. A.*, 1939, **112**, 387; Chaikoff, I. L., and Connor, C. L., PROC. SOC. EXP. BIOL. AND MED., 1940, **43**, 638.

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[1] Becker, E. R., and Dilworth, R. I., *J. Inf. Dis.*, 1941, in press.

TABLE I.
Mean 16-day Weight Gains and Mean Number of Oöcysts Eliminated by Rats Infected with *Eimeria nieschulzi*.

	Test Series				Reference Series			
			No. oöcysts				No. oöcysts	
Lot	No. rats	Wt gains, g	Millions	S.E.	No. rats	Wt gains, g	Millions	S.E.
1	5	50	22.0	± 8.2	5	28	208.2	±27.7
2	9	37	17.1	± 8.4	8	26	150.8	±17.4
3	7	43	61.4	±21.7	6	25	210.8	±13.2
4	8	42	94.1	±30.2	8	24	127.1	±17.0

series were in each case composed by dividing litters of similar ages and not previously infected, as nearly equally as possible according to weight and age. The reference ration was made up in parts by weight as follows: beet-sugar, 69; casein (unextracted), 14; soy bean oil meal, 6; normal salts (Harris), 4; fine cellulose, 2; lard, 3; cod liver oil, 2. The test series was also fed this reference ration, but in this case each animal received every other day into the body cavity an injection of 15 μg vitamin B_1 and 40 μg vitamin B_6. In the case of lots 1 and 2, the reference rats received an injection of 40 μg vitamin B_6 every other day, but no B_1. In lots 3 and 4 the reference rats were not injected. The weight gains appearing in the table represent the mean maximum for the series attained during the first 16 days of the experiments, and the number of oöcysts the mean number passed by the series during the entire course of an immunizing infection.

The results obtained were no less striking than when the vitamins were fed. In lots 1 and 2 (Table I) the reference series produced practically 9 times as many terminal stages of the parasite (oöcysts) during the infection as the test series; in lot 3, between 3 and 4 times as many. When the differences between the counts in each of the first 3 lots were tested for significance by Fisher's small sample method, the values of P obtained indicated high significance. Lot 4 deserves special comment, for in this case there were 2 counts in the test series that far exceeded even the highest in the reference series, so that a mean of 94.1 was obtained, even though the remaining 6 counts averaged but 46. A few similar cases were encountered in the previously mentioned experiments[1] in which the vitamins were fed.

Conclusion. Vitamins B_1 and B_6 have an inhibiting influence on the development of *Eimeria nieschulzi* infections in rats on a special ration when administered by a parenteral route, one at least as striking as when the vitamins are fed.