BLOOD RESPONSE AND NITROGEN BALANCE FOLLOWING LIVER EXTRACT

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ONE PATIENT with addisonian pernicious anemia, and one with sprue with normal gastric acidity and without diarrhea, were studied (Unit history number 442154 and 486382 respectively).

The patients were in the metabolism ward on weighed diets. Urinalyses were done on 24 hour specimens, stool samples were pooled for several days and aver-

TABLE 1

Sprue

	Day		
	1*	7	14
N balance		−11.6	+8.9 Gm. per period
RBC	1.0	1.5	2.4 millions
Retics	1.8	49.0	16.0 per cent
Hgb. N	26.7	59.2	79.9 Gm. total
Plasma N	42.5		42.4 Gm. total
Creatine		3.16	1.1 Gm. per period

Pernicious Anemia

	Day			
	1	9†		19
N balance		−3.8		+18.4 Gm. per period
RBC	2.7	2.6		3.7 millions
Retics	1.9	2.8	7.6	2.6 per cent
RBC N	88			99 Gm. total
Plasma N	36			31 Gm. total
Creatine		0.781		0.067 Gm. per period

* Liver extract 150 units parenterally, day 2.

† Liver extract 45 units parenterally every two days from day 9.

aged. Plasma volume and red cell volume were done by T-1824 and venous hematocrit, serum proteins by the Howe method. The main results are given in table 1.

In the sprue patient the hematologic response took place while the patient was in negative nitrogen balance; in the pernicious anemia case positive N balance and blood response coincided.

The plasma N did not increase significantly; the rise in hemoglobin N represents a transfer from bone marrow to peripheral circulation.

It is of interest that in both cases positive balance was established and creatinuria

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lessened. In the pernicious anemia patient this occurred without change in N or caloric intake; in the sprue case appetite made increased diet essential to satisfy the patient.

Mosenthal[1] in 1918 showed that the forced feeding of a diet rich in meats restored nitrogen balance in pernicious anemia.

The present studies were undertaken to determine whether the positive nitrogen balance appeared before the hematologic response following liver therapy. If this had occurred it might indicate that an important site of action of liver extract was on the gut wall. This, however, was not the case, and liver extract presumably acts directly on the immature red cells in the marrow cavity.

REFERENCE

[1] MOSENTHAL, H. O.: The effect of forced feeding on the nitrogen equilibrium and the blood in pernicious anemia. Bull. Johns Hopkins Hosp. *29:* 129, 1918.