

INTESTINAL ABSORPTION IN INFANTILISM.*

BY F. H. MCCRUDDEN AND H. L. FALES.

*(From the Hospital of The Rockefeller Institute for Medical Research,
New York.)*

Previous investigation has shown that in certain cases of infantilism the amount of nitrogen and other elements in the urine is very low, and the amount of these elements in the feces is high. It occurred to us that the losses through the feces might be responsible for the low plane of metabolism and for the failure to develop. To test this possibility, a diet rich in protein was fed for a long period to a dwarf (F. S., reported in earlier papers). Losses of nitrogen through the feces due to inadequacy in the digestion or absorption of protein would, of course, be exaggerated by the high protein diet and would give rise to even higher values for the nitrogen of the feces. At the same time such a diet should raise the plane of metabolism and lead to improvement in the clinical condition.

A high protein diet was maintained for over two months, but attacks of eczema, possibly attributable to the diet, led to its discontinuance, so that not much stress can be laid on the clinical observation that there was no improvement in growth. The chemical examinations were more helpful. Table I shows the results of examinations made before the high protein diet was begun, and table II those made after the diet had been continued for several weeks.

TABLE I.

Date.	Urine.						Nitrogen in feces.
	Total nitro- gen.	Kreatinin.	Kreatin.	Calcium oxide.	Magnesium oxide.	Phosphorus pentoxide.	
Oct. 23, 1911	4.54	0.253	0.107	0.0144	0.223	1.230	1.34
Oct. 24, 1911	2.70	0.238	0.022	0.0192	0.133	0.772	3.32
Oct. 25, 1911	2.66	0.205	0.048	0.0112	0.140	0.780	1.75
Oct. 26, 1911	2.50	0.213	0.034	0.0110	0.130	0.832	1.48

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TABLE II.

Date.	Urine.						Nitrogen in feces.
	Total nitrogen.	Kreatinin.	Kreatin.	Calcium oxide.	Magnesium oxide.	Phosphorus pentoxide.	
Dec. 14, 1911	12.50	0.386	0.800	0.0156	0.1254	1.633	1.076
Dec. 15, 1911	15.36	0.425	1.015	0.0224	0.1688	1.991	1.225
Dec. 16, 1911	20.80	0.519	1.864	0.0340	0.1830	2.581	1.931
Dec. 17, 1911	12.88	0.337	0.863	0.0216	0.1712	1.822	0.797

In spite of the fivefold increase of food protein in the second period, the nitrogen of the feces is not only not increased, but actually decreased,—a finding indicating that the high nitrogen of the feces on the usual diet can not be due to any inadequacy in the digestion or absorption of protein. The results are in accord with those of previous experiments¹ in indicating that the nitrogen in the feces in infantilism is of the same origin as that in normal feces, being chiefly excretory and not representing unabsorbed food residue.

The increased excretion of nitrogen, phosphate, and, to a less extent, magnesium in the urine on a high protein diet is further evidence that there is no considerable disturbance in the digestion or absorption of protein. It is evident too that we can raise the plane of the metabolism of the elements of the soft tissues without affecting either growth or the metabolism of calcium.

The effect of the high meat diet on the kreatin excretion is important. It will be observed that the amount of kreatin excreted runs parallel day by day with the total nitrogen excretion, so that at least some of the kreatin excreted must have an exogenous origin. Folin² has found that kreatin of the food appears again in the urine only when the nutrition of the individual is on a high plane, so that it is fair to assume that the nutrition of our patients is on a high plane. The results seem to exclude the possibility that the failure to develop depends on a condition of malnutrition of the soft tissues or on a fundamental inability to engage in a higher rate of metabolism.

¹ McCrudden, F. H., and Fales, H. L., *Jour. Exper. Med.*, 1913, xvii, 20.

² Folin, O., *The Chemistry and Biochemistry of Kreatin and Kreatinin*, Olaf Hammarsten, Festschrift, Upsala, 1906.

The results are in accord with those of our previous work in indicating that there is no disturbance in the digestion, absorption, or utilization of protein in the dwarfs of this type. Large quantities of protein food are digested and absorbed as readily as small quantities without any observable favorable effect on the skeletal abnormalities or on the abnormalities in the calcium metabolism. The general nutrition appears to be good and on a high plane.