CXCI. METABOLISM IN TETANY.

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IN the communication of Greenwald [1932] criticising the work detailed in the paper on metabolism in tetany by Morris, Watson and Morris [1931] the data to which most objection is taken are those referring to the phosphorus and calcium intake. Greenwald states that our ratios for the combined oatmeal milk diets are with three exceptions lower than the usual P/Ca for milk which he gives as 1.7. But according to Sherman the phosphorus and calcium contents of whole milk are 0.093 % and 0.120 % respectively, giving a P/Ca ratio of 0.78. It is clear that Greenwald is using the $\frac{P_2O_5}{Ca}$ ratio which according to Sherman is 1.77. In our paper we stated definitely that the mineral intake was computed as calcium and phosphorus. It would appear that this mistake of Greenwald in assuming a ratio of 1.7 for the P/Ca ratio invalidates his criticism of our calcium and phosphorus figures, the variations in which are clearly due to the varying amounts of milk and oatmeal consumed.

In the analyses sent to Greenwald privately and quoted by him the figures for phosphorus are obviously those used for P_2O_5 so that in these particular milks (not those used in the tetany experiments, which were "separated") the P/Ca ratios varied from 1.1 to 1.2.

As regards the difficulty with the nitrogen-chlorine ratios it is stated on p. 789 [1931] that the cats were treated with saline. Protocols had been prepared giving the exact amounts of NaCl administered and the times of administration. Unfortunately for reasons of space-economy they had to be omitted, but we did not feel this was of great import since all the chlorine injected during each period was included in the intake for that period. This explains Greenwald's difficulty in co-ordinating the ratios. The porridge-milk mixture was sampled every day and analysed: in addition all the food residues were collected and analysed daily. Table I shows the nitrogen-chlorine ratios for the cat-feeds in all the periods. The variation in the normal periods except for that of Cat 4 is not very great when it is remembered that no attempt was made to weigh the quantity of salt added. This was obviously unnecessary since the food mixture itself was analysed. If we estimate the intake of Cl during the active period of Cat 3 (quoted by Greenwald) on the assumption that the N/Cl ratio

Table I.

Nitrogen/chlorine ratios of the food-intake in the various periods.

Cat	I.	Normal	...	...	...	...	4.4
		Latent	...	...	...	...	4.5
		Active	...	...	...	...	3.7
		Recovery	...	...	...	...	4.1
„	II.	Normal	...	...	...	...	6.2
		Latent	...	...	...	...	5.7
„	III.	Normal	...	...	...	...	5.5
		Latent	...	...	...	...	2.6
		Active	...	...	...	...	1.0
		Recovery	...	...	...	...	5.5
„	IV.	Normal	...	...	...	...	8.8
		Latent	...	...	...	...	5.7
„	V.	Normal	...	...	...	...	6.0
		Latent	...	...	...	...	4.8

of the food was the same as that for the normal period we find that it should be about 0.130 g.; leaving, according to our figure, 0.546 g. of Cl to be injected. Actually 20 cc. of $M/2$ NaCl was injected, *i.e.* 0.355 g. of Cl—a close enough approximation if one remembers that the oatmeal and milk were consumed in different proportions during the two periods.

Greenwald complains of the considerable variation in the compositions of the milk and oatmeal. As already stated we did not analyse samples of the individual foodstuffs for each period but only the actual food mixtures and residues daily. Nevertheless Table II shows how close the figures are when we

Table II.

	N	Ca	P
I. Oatmeal 100 g.	3.3	0.100	0.200
Milk 100 g.	0.63	0.120	0.120
Total	3.93	0.220	0.320
Amount actually consumed by Cat III. Normal period	3.90	0.203	0.293
II. Oatmeal 12 g.	0.40	0.012	0.024
Milk 50 g.	0.32	0.060	0.060
Total	0.72	0.072	0.084
Amount actually consumed by Cat III. Active period	0.71	0.057	0.110

assume a certain ingestion of oatmeal and milk and use the analytical results of samples of oatmeal and milk obtained before the commencement of the experiments.

The high retentions of nitrogen in Cats 3, 4 and 5 are commented on. It need only be said that the cats which were young, were imported into the laboratory just prior to the experiment, that their previous feeding was unknown and that the nitrogen figures do not enter into the argument of the paper.

Finally we regret the mistake in giving the date of publication, and the error in writing "decreased" instead of "increased" in the first line of the paragraph headed "Phosphorus" on p. 795. As regards the interpretation of conclusions we feel that we were just as entitled to draw these deductions from Greenwald's paper as he is entitled to criticise our own data.

REFERENCES.

Greenwald (1932). *Biochem. J.* **26**, 954.

Morris, Watson and Morris (1931). *Biochem. J.* **25**, 786.