hours) by the Van Slyke method. The total volume of the cells was determined at the end of the experiment either by the hematocrit or the conductivity method of Stewart.[3] The following table presents a summary of the experimental results. The data are the average of those obtained in 5 experiments. In all cases the reaction of the cells in 0.9 per cent saline has been taken as the normal amount, 100 per cent in the table.

TABLE 1.

NaCl Equivalent of the Solution	Volume of Cells Per Cent	Per Cent of O_2 Consumed
0.5	115	62
0.7	107	90
0.9	100	100
1.1	87	80
1.3	78	50

In all cases the reaction of the solution was pH 6.9.

It may be seen that the variations in the tonicity of the solution decreases the amount of oxygen consumed during the period of the reaction, and, that the solution isotonic with the blood is the most favorable for the reaction. In the light of the above discussion, provided the assumptions are correct, it is difficult to conceive of the surface of the cell being an important factor in the oxidations by the cell. At the same time it is evident that disturbances in structure profoundly influence the oxidations of the cell, as might be supposed.

[1] Ray, G. B., *Am. J. Physiol.*, 1927, lxxxii, 405.
[2] Warburg, O., *Ergeb. Physiol.*, 1914, xiv, 253.
[3] Stewart, G. N., *Am. J. Physiol.*, 1924, lxix, 531.

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Effect of Starvation on Healing of Rickets in Rats.

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McCollum and his coworkers[1] demonstrated in 1922, that fasting would cause active rickets to heal within 24 or 48 hours. The immediate cause of such healing seemed clear when it was demonstrated by Kramer and Howland[2] and confirmed by Cavins[3] that

starvation was promptly followed by a rise in the inorganic phosphorus of the blood serum.

Some experiments which we have performed recently seem to cast doubt upon this belief, and would seem to suggest that starvation causes healing by some other means than raising the blood phosphorus.

In the course of some experiments* on the effect of salts on calcification *in vitro,* we ran a duplicate series with preparations made from rachitic rats which had been starved for 24 hours before use. The results which are shown in the accompanying table were quite different from those obtained on the control series of rachitic rats which had not been starved.

TABLE I.

Effect of Previous Starvation of Rats on Calcification of Preparations in vitro.

Condition of Rats	NaCl added to basal solution	Number of preparations	Calcification
	mM.		
Unstarved	8.5	3	++++
"	17.1	3	++++
"	34.3	3	++±
"	51.3	3	none
Starved 24 hours	8.5	3	++++
" " "	17.1	3	++++
" " "	34.3	3	++++
" " "	51.3	3	++++

The basal solution used had the following composition:

Na	11.9 mM.	Cl	5.0 mM.
Ca	2.5 mM.	CO_3	10.0 mM.
P	0.97 mM.	Phenol Red	0.0006%

The solution to which 51.3 mM. NaCl had been added inhibited calcification entirely with preparations made from rats kept on the McCollum No. 3143 diet, while the preparations made from the starved rats calcified perfectly.

Obviously the amount of blood clinging to a sample of sliced cartilage is negligible, and the result must therefore be attributed to some other change brought about in the cartilage by starvation.

* The technique used was as described in a recent paper by one of us.[4]

[1] McCollum, Simmonds, Shipley and Park, *Bull. J. H. Hosp.*, 1922, xxxiii, 31.

[2] Kramer and Howland, *Bull. J. H. Hosp.*, 1922, xxxiii, 313.

[3] Cavins, *J. Biol. Chem.*, 1924, lix, 237.

[4] Shipley, Kramer and Howland, *Biochem. J.*, 1926, xx, 379.