

TABLE I.

The Equivalents of Cations in 20 mm³ of Eggs as Shown by the First Pronounced Maximum Attained After 15 or 30 Minutes Immersion in Solutions Containing Tagged Cations; Together with Theoretical Maximum Contents.

Radioactive ion	Species used	State of eggs	Equivalents in 20 mm ³	
			Observed × 10 ⁷	Calculated × 10 ⁷
Na	<i>Urechis caupo</i>	Unfertilized	18	96
"	" "	Fertilized 60 min	32	"
K	<i>Pisaster ochraceus</i>	Unfertilized	19	137
Rb	" "	"	66	"
"	<i>Patiria miniata</i>	"	62	—

The later course of cation absorption markedly shows loss phases and also primary accumulation, a reoccupation of salt linkages originally occupied by inactive cations. The rhythm of oscillations is characteristic of any given lot of eggs, regardless of the fertilization. Different lots give other rhythms, maxima usually recurring at intervals of 1-2 hours. KCN, 0.001 M, inhibits these oscillations, which therefore depend upon metabolic processes which are independent of fertilization.

It is stressed that these features of cation absorption are general for protoplasm, both plant and animal, and can be interpreted best in terms of ion exchanges, including organic ions produced possibly as so-called "waste products".

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Effect of Certain Radioactive Elements on the Metabolism of Cells.

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In order to see whether there is any effect by the addition of radioactive elements on the metabolism of cells, radioactive Na or K was added to solutions containing *Nitella* or *Elodea* or red blood cells and the oxygen consumption was measured by the Warburg method.

For *Nitella* and *Elodea*, the solutions of NaCl and KCl were .01 M at 25°C. For red blood cells, isotonic solutions of NaCl were used, namely, 1.12% at 37°C. The solutions had activities from 2.2 to 12 mC/liter, keeping the concentrations the same. Both sheep and chicken defibrinated blood was used. CO₂ was absorbed by KOH

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No. of exps.	Cell	Element	pH	Activity (mC/liter)	Duration of exp. hr	Effect
2	Nitella	KCl	7.3	4	24	None
6	"	NaCl	8.2	20	24	"
6	"	"	7.3	5	4	"
4	"	"	8.2	2.2	24	Slight increase
6	Elodea	"	7.2	13		None
6	Sheep r.b.c.	"	7.3	—	4	"
6	Chicken r.b.c.	"	7.3	5	4	"

according to the usual method. The pH of the NaCl and KCl solutions was 7.2. In certain cases with pond water it was 8.2. Controls with non-radioactive salts were done in all cases. Table I gives the results.

In most cases there was no observable effect on O₂ consumption as indicated by the Warburg method. The exception is that of *Nitella* when a low activity of NaCl (2.2 mC/liter) was used, and a slight acceleration was noted. There was, however, no immediate rise in oxygen consumption within a few minutes corresponding to the rapid ion exchange as shown in the induced absorption or first phase of ion exchange as illustrated by S. C. Brooks.¹ More refined methods may show other results.

It is concluded that there is no effect upon oxygen consumption because of the radioactivity of these ions.

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Ultraviolet Absorption Spectra of Active and Inactive Yeast.

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The ultraviolet inactivation spectrum of yeast has been investigated by several workers, notably Wyckoff and Luyet,¹ Ehrismann and Noethling,² Oster,³ and Schreiber.⁴ These workers are in substantial agreement on the most effective wave-length region and on the

¹ Brooks, S. C., *PROC. SOC. EXP. BIOL. AND MED.*, 1938, **38**, 856.

¹ Wyckoff, R. W. G., and Luyet, B. J., *Radiology*, 1931, **17**, 1171.

² Ehrismann, O., and Noethling, W., *Z. Hygiene Infektionskr.*, 1932, **113**, 597.

³ Oster, R. H., *J. Gen. Physiol.*, 1934, **18**, 251.

⁴ Schreiber, H., *Strahlentherapie*, 1934, **49**, 541.