

fixation of the dye when inoculated into animals nor did it induce coagulation of citrated plasma in the test tube.

The "staphylocoagulase" precipitated from the filtrate of a culture of the microorganism when injected intracutaneously in a rabbit is absorbed from the skin by the tributary lymphatics, as indicated by the mild cellular reaction in the regional lymph nodes. Yet it fails to exert a sufficiently powerful local reaction to obstruct lymphatic drainage by the formation of a fibrinous barrier. Trypan blue diffuses readily from the site of its cutaneous inoculation and the tributary lymphatics are found unoccluded. These observations indicate that "staphylocoagulase" evidently plays no rôle in inducing prompt mechanical obstruction to lymph flow. The latter is therefore primarily referable to the powerfully necrotizing action *per se* of the *Staphylococcus aureus* microorganism and of its soluble toxin.

8053 P

Oxidation of Carbohydrates and Polyhydric Alcohols by Luminous Bacteria.

FRANK H. JOHNSON. (Introduced by E. Newton Harvey.)

From the Laboratories of General Physiology, Princeton University.

A comparative study of the oxidation of single substrates by the "resting" cells of the marine (*Achromobacter fischeri*) and the fresh water (*Vibrio phosphorescens*) luminous bacteria has revealed considerable difference in the ability of the 2 species to oxidize various carbohydrates and polyhydric alcohols. The rates of aerobic oxidation of 28 substrates by "resting" cells, prepared by washing thoroughly in the centrifuge and resuspending in phosphate buffer, were followed over a period of 3 hours in Warburg respirometers. The suspensions were adjusted to approximately the same density by means of a photronic cell turbidimeter. The concentration of all substrates was M/60.

Although the per cent increase in oxygen uptake of the suspensions with substrate as compared with similar ones without the addition of substrate varied in some cases to a fairly wide degree, the ratio of the oxygen consumption with a given substrate to that with dextrose as a standard generally agreed to within less than 10% in repeated experiments. The controls, without added substrate, agreed with vessels containing substrates that were not oxidized to

TABLE I.
Aerobic Oxidation of Carbohydrates and Alcohols by "Resting" Cells of Luminous Bacteria.

Substrates Oxidized	<i>Vibrio phosphorescentis</i>				<i>Achromobacter fischeri</i>			
	No. of deter- minations on different suspensions	Aver. mm ³ O ₂ per 3 hr.	Aver % increase over "resting" cells	Aver ratio of O ₂ con- sumption to that with dextrose	No. of deter- minations on different suspensions	Aver. mm ³ O ₂ per 3 hr.	Aver % increase over "resting" cells	Aver. ratio of O ₂ con- sumption to that with dextrose
Dextrose	10	150.	516	1.0	9	101.	721	1.0
Fructose	5	108.	372	.79	2	95.	592	.90
Sucrose	3	101.	342	.70				
Trehalose	2	92.	330	.68				
Melicitose	2	87.	309	.65	2	65.	455	.61
Mannose	2	70.	209	.48	2	60.	367	.60
Glycerine	2	62.	192	.43	2	62.	381	.62
Maltose	2	49.	100	.34	1	39.	158	.37
Alpha galactose	3	43.	93	.32	2	50.	330	.51
Raffinose	2	34.	59	.28				
Sorbit	2	32.	41	.23				
"Resting" cells	10	22.		.16	9	12.		.12
Substrates not oxidized								
			d-Arabinose,* l-Arabinose, l-Rhamnose, d-Lyxose, Xylose, Ethylene Glycol, Dulcitol, Quercit, Mannit, d-alpha-Gala- heptose, d-beta-Galaheptose, d-alpha- Mannheptose, d-Mannoketohexose, Cellobiose, Turanose, Lactose, Kojic acid				d-Arabinose, l-Arabinose, l-Rhamnose, d-Lyxose, Xylose, Ethylene Glycol, Dulcitol, Mannit, Quercit, d-alpha-Gala- heptose, d-beta-Galaheptose, d-alpha- Mannheptose, d-Mannoketohexose, Cellobiose, Turanose, Lactose, Kojic acid, Sucrose, Trehalose, Raffinose, Sorbit	

*All the d- and l- forms of the sugars listed were kindly supplied by Dr. C. S. Hudson, of the National Institute of Health.

within 5% in the case of *Vibrio phosphorescens* though the agreement was not as close in the case of *Achromobacter fischeri*, in which the endogenous O₂ uptake was quite small and difficult to measure accurately.

The results are summarized in Table I. It is difficult to find any important correlations between the molecular configuration of the substrate and the ability of the organism to oxidize it. From the work that has been carried out thus far, however, it would seem that the primary limiting factor in both species is the number of carbon atoms, since only those compounds having 3 or 6 carbons are utilized. In the case of the disaccharides, those with beta linkages apparently are not utilized, while those with alpha linkages may or may not be utilized, irrespective of whether they are reducing sugars. (The type of linkage in sucrose, which is oxidized by the fresh water species, is not known.) Raffinose, which has a beta and a sucrose linkage, is oxidized only very slowly by the fresh water, and not at all by the marine species.

The results obtained by the respirometers were checked by acid production from the various substrates, under conditions of partial anaerobiosis. The method employed will be published shortly. The only discrepancy was in the case of glycerine, which is readily oxidized aerobically, but apparently not under conditions of limited oxygen supply.

8054 P

Effect of Experimental Hypothyroidism on Period of Gestation in the Rabbit.*

BORIS KRICHESKY. (Introduced by B. M. Allen.)

From the Department of Zoology, University of California at Los Angeles.

In some unpublished data obtained in this laboratory, it was found that thyroid removal in the pregnant female albino rat resulted in abortion or resorption of the fetuses, provided this operation was done before the first two-thirds of the gestation period.¹ Because the rabbit possesses a somewhat different type of ovarian activity than does the rat, it was thought to be of interest to determine

* Aided by a research grant from the University of California, and under the supervision of Dr. B. M. Allen. Appreciation is expressed to Mr. Allen Lein for technical assistance given.

¹ Eckert, J. F., and Mazur, H.